

## Daseintropy

“That everything is on fire, slow fire, and we’re all less than a million breaths away from an oblivion more total than we can even bring ourselves to even try to imagine, in fact, probably that’s why the manic US obsession with production, produce, produce, impact the world, contribute, shape things, to help distract us from how little and totally insignificant and temporary we are.”

David Foster Wallace, *The Pale King*

Peirce’s formulation of what he called “abductive inference” is this: “The surprising fact *C* is observed. But if *A* were the case then *C* would be a matter of course. Therefore, there is reason to suspect that *A* is the case.”<sup>1</sup>

Let *C* be the “manic . . . obsession with production, produce, produce, impact the world, contribute, shape things.” The record shows that Heidegger found *C* appallingly destructive. In “planetary technology” Heidegger saw “the possibility of mankind’s death;”<sup>2</sup> “the laboring animal is left to the giddy whirl of its products so that it may tear itself to pieces and annihilate itself in empty nothingness;”<sup>3</sup> “Reasons cannot be given why the people now populating the planet and destroying it in every possible way should continue to exist without end.”<sup>4</sup> Most notoriously:

“even the tending of the fields has gone over to the same requisitioning that imposes upon the air for nitrogen, the soil for coal and ore, the ore for uranium, the uranium for atomic energy, and the latter for orderable destruction. Agriculture is now a mechanized food industry, in essence the same as the

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<sup>1</sup> *Collected Papers of Charles Sanders Peirce; Volume V, Pragmatism and Pragmaticism* (ed. Charles Hartshorne and Paul Weiss 1965) para. 189; p. 117.

<sup>2</sup> Letter to Medard Boss, September 8, 1970 in *Zollikon Seminars: Protocols—Conversations—Letters* (ed. Medard Boss; tr. Franz Mayr and Richard Askay 2001) 289.

<sup>3</sup> “Overcoming Metaphysics,” in *The End of Philosophy* (tr. Joan Stambaugh 1973) 87.

<sup>4</sup> Letter to Boss, *Zollikon Seminars* 289. In 1970 atmospheric CO<sub>2</sub> was about 325 parts per million; in 2018 it has been measured at 410 ppm; an increase of roughly 26% in 48 years. <https://www.co2.earth/>. Since the Quaternary Megafauna Extinction extending from about 50,000 to 3,000 years ago, “While the total biomass [carbon weight] of wild mammals (both marine and terrestrial) decreased by a factor of ≈ 6, the total mass of mammals increased approximately fourfold from ≈ 0.04 [gigatons of carbon] to ≈ 0.17 Gt C due to the vast increase of biomass of humanity and its associated livestock.” Y. N. Bar-On, R. Phillips, and R. Milo, “The biomass distribution on Earth,” *Proc. Nat’l Acad. Sci. USA* May 21, 2018; <http://www.pnas.org/content/early/2018/05/15/1711842115>.

production of corpses in the gas chambers and extermination camps, the same as the blockading and starving of countries, the same as the production of hydrogen bombs.”<sup>5</sup>

Let all that activity, constructive and destructive, be C. What is A?

The candidate proposed here is the tendency toward maximum entropy production (MEP) as specifically instanced in the newly-emergent kinetic pathway that is Dasein. ‘Daseintropy’ then designates the increase in entropy and in rate of entropy production attributable to ‘existence’ in Heidegger’s sense of that term.<sup>6</sup>

The MEP principle states that:

“if there are sufficient degrees of freedom, that is, sufficient choice among steady states that all meet the fundamental conservation laws, the system would be characterized by a state . . . at which maximum physical power is generated, gradients are dissipated at the fastest possible rate and hence the associated entropy production is maximized.”<sup>7</sup>

Here’s what is **not** meant by Daseintropy:

“This is how humankind contributes to the rise of entropy in the Universe: We consume organized energy in the form of structured foodstuffs, and we radiate away as body heat an equivalent energy in the form of highly disorganized

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<sup>5</sup> “Positionality” in *Bremen and Freiburg Lectures: Insight into that Which Is and Basic Principles of Thinking* (tr. Andrew J. Mitchell 2012) 27.

<sup>6</sup> This conjecture repeats specifically for Dasein what Ulanowicz and Hannon conjectured for life generally: “Now if living systems were constituted so as to decrease entropy production, the emergence of heterotrophs would be retrogressive. [Because “Predation usually requires the development of physiological or behavioural programs, which are usually more expensive to maintain (i.e. generate more dissipation) than the corresponding defences to predation adapted by the prey.”] However, if all life serves to increase the rate of entropy production, the emergence of heterotrophs poses no anomaly, but rather underscores a uniform tendency in nature.” R. E. Ulanowicz and B. M. Hannon, “Life and the Production of Entropy,” 232 *Proc. Trans. R. Soc. B* 181, 183 (1987). C = the emergence of heterotrophs; A = all life serves to increase the rate of entropy production. Now in the ontological dimension: “Heidegger’s philosophical focus never strayed from *die Sache selbst*, the astonishing fact that with human existence sense irrupts into an otherwise meaningless universe.” Thomas Sheehan, “Astonishing! Things Make Sense!,” 1 *Gatherings: The Heidegger Circle Annual* 1 (2011); <http://heidegger-circle.org/Gatherings2011-01Sheehan.pdf>. So C = the astonishing fact, etc.; A = sense-making serves to increase the rate of entropy production.

<sup>7</sup> A. Kleidon, Y. Malhi, and P. M. Cox, “Maximum entropy production in environmental and ecological systems,” 365 *Proc. Trans. R. Soc. B* 1297, 1298 (2010)—the introductory article to a special issue of the Royal Society’s *Proceedings* dedicated to the MEP research program. <http://rstb.royalsocietypublishing.org/content/royptb/365/1545/1297.full.pdf>

infrared photons. We, too, are dissipative structures – highly evolved dissipators.”<sup>8</sup>

Although accurate as far as it goes that formulation does not distinguish *us* from our pets and livestock. *Our* thermodynamic distinction lies in technology, from raising crops to cooking food to watching movies. Dasein’s niche-making is characterized by its use of technology and the use of technology accelerates the production of entropy.

Consider an example from agriculture. Chaisson estimates the ‘free energy rate density’ (‘power density’) – units of energy per unit of time per unit of mass – of various systems. He designates this value  $\Phi_m$ . He estimates the global average  $\Phi_m$  for wild terrestrial plants to be 900 ergs per second per gram. “However, a more organized field of corn photosynthesizes nearly ten times more efficiently,<sup>9</sup> and a highly cultivated field of sugarcane (one of the most efficient converters of sunshine into biomass) can be higher still; their values of  $\Phi_m$  are in the range of 6000 and 10,000  $\text{erg s}^{-1} \text{g}^{-1}$ , respectively.” Hence the production of entropy from cultivation increases over that from the natural growth of wild plants. Moreover, because the “enhanced organization of the field produced by modern agricultural techniques requires higher  $\Phi_m$  values to maintain that organization” this higher  $\Phi_m$  “represents an energy contribution of a cultural, technological” kind; and concomitantly an entropy production of a cultural, technological kind.<sup>10</sup> Chaisson comments,

“If there is any one factor that has most characterized the evolution of culture, it is surely an increasing capacity to extract energy from Nature—but not merely to capture energy, but rather to store it, to transfer it, in short to process energy. . . . To be sure, the ability to harness abundant energy sources is the hallmark of modern society. But it is also clearly the source of an inexorable rise in entropy within our larger environment—widespread pollution, waste heat, and social tumult, among other social ills.”<sup>11</sup>

Heidegger’s image of humankind as “a storm sweeping over our planet”<sup>12</sup> captures the essence of Dasein’s role in the thermodynamics of the biosphere: like a storm Dasein increases the rate of entropy production. In this sense Dasein is to the biosphere as convection is to conduction.<sup>13</sup>

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<sup>8</sup> Eric J. Chaisson, *Cosmic Evolution: the Rise of Complexity in Nature* (2001) 138.

<sup>9</sup> That is, converts relatively more incoming solar energy into chemical energy stored in glucose molecules. *Cosmic Evolution* 253 note 6.

<sup>10</sup> *Id.* 184-185.

<sup>11</sup> *Id.* 207.

<sup>12</sup> *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude* (tr. William McNeill and Nicholas Walker 1995) 7. *ein Sturm, der über unseren Planeten fegt.*

<sup>13</sup> Storms are convection cells. Conduction dissipates thermal energy by the collision of molecules, with no net transport of matter; convection dissipates energy by conveying matter. A convection cell is a structure induced in

But why 'Dasein' in this conjecture? Why Heidegger's term rather than simply 'human being,' 'rational animal,' 'top predator,' or something else? What explanatory power does 'Dasein' add?

Heidegger was seeking, in Thomas Sheehan's account, "the source of intelligibility, but unlike traditional metaphysics he sought a non-theistic, non-subjective, non-substantive source, the correlative of which was not an ontological subject, either divine or human, but a phenomenologically experienced 'e-ject,' a self-concerned thrown-openness."<sup>14</sup>

Sheehan characterizes the *kinesis* of self-concerned thrown-openness – Dasein – in these words:

"Every step we take forward is answered by the horizon moving a step backward. If human being is endlessly open, then its correlate is the endlessly open-ended. . . . we face endless possibilities of self-realization within the world, in a progression bordered finally only by death. . . . All we perform are endless acts of self-transcendence; and in that way we endlessly 'humanize' the world, learning to be at home everywhere within it. . . . Our finite infinity means we are always a lack of fullness. We may try forever to fill up the lack, but we will never succeed; it's an abyss. . . . Our horizon is like that of the expanding universe that

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a fluid system by an applied energy gradient. A convection cell dissipates the gradient more rapidly than the system is able to do in the absence of the cell. This structure is the system's response to increase of the applied gradient. "Such responses always involve kinetic pathways of some kind. As thermodynamic gradients are increased, uncoupled (random) microscopic motions typically prove inadequate kinetic pathways for mediating flows, and systems make discontinuous transitions to more macroscopically ordered kinetic regimes (e.g., from conduction to convection)." J. S. Wicken, "Entropy and Evolution: Ground Rules for Discourse," 35 *Systematic Zoology* 22, 27 (1986). "Heat engines are devices that convert heat into mechanical energy. Therefore, any natural convective phenomenon is a heat engine." N. O. Rennó, M. L. Burkett, and M. P. Larkin, "A Simple Thermodynamical Theory for Dust Devils," 55 *Journal of the Atmospheric Sciences* 3244, 3245 (1998). All convective phenomena come into being by virtue of their capacity to dissipate energy, to destroy energy gradients. "The intensity of dust devils depends on the product of two thermodynamic efficiencies, corresponding respectively to vertical and horizontal temperature gradients." "Dust Devils" at 3244. Dust devils, thunderstorms, hurricanes, and the like are all structures of matter in motion which transport energy from a hot source to a cold sink in the service of more rapid dissipation of energy gradients. In such circumstances "the rate of generation of entropy . . . is increased, because now energy is being dissipated more rapidly as it flows in an orderly way within the cells and passes from the hot source to the cold sink. Second, along with the more rapid production of entropy there is a *structure* where no structure existed before . . . . As soon as the temperature differential is removed [or reduced below a threshold]. . . the convection cells disappear. The structure is sustained by the *flow* of energy, and as soon as that ceases the structure decays." Peter W. Atkins, *The Second Law* (1984) 183.

<sup>14</sup> *Making Sense of Heidegger: A Paradigm Shift* (2015) 158;

<https://religiousstudies.stanford.edu/sites/default/files/publications/making-sense-of-heidegger-a-paradigm-shift.pdf>

keeps offering us more world to explore.”<sup>15</sup>

Chaisson observes that by its expansion “The Universe self-generates a thermal gradient, and increasingly so with time, suggestive of an ever-powerful heat engine were it not for its mechanistic inference.”<sup>16</sup> At its local scale Dasein self-generates an ontological gradient; the gradient which Sheehan describes.

The “endlessly open-ended . . . endless possibilities of self-realization within the world” form the hot end of the gradient, the source.<sup>17</sup> The cold sink is our “lack of fullness,” “an abyss” which we will never fill.<sup>18</sup> With source and sink in place all that’s needed to make an ontological engine is a converter.<sup>19</sup> And that converter is the as-structure<sup>20</sup>; by which we perform “endless acts of self-transcendence” and “endlessly ‘humanize’ the world.”<sup>21</sup> I.e., our niche-making; *Weltbildung*.

The proposition that an ontological engine gears into nature with thermodynamic effect gets some support from a recent work by Carlo Rovelli.

Rovelli agrees with Heidegger that Dasein is time:

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<sup>15</sup> “From Divinity to Infinity,” in *The Once and Future Jesus* (2000) 35-36, 37, 39; <https://drive.google.com/file/d/0B7NHCKm1kkQGeWVQZnY3SG9fYUU/view>. See also Katherine Withy: “There may be sense to be made of the idea that human beings are essentially uncanny because of some concealment, gap, lack, discrepancy, excess, finitude, or self-disruption. Such uncanniness would belong to the human essence as part of the human project of making familiar or making sense of things.” *Heidegger on Being Uncanny* (2015) 46. Some variants: Marx: “Man is distinguished from all other animals by the limitless and flexible nature of his needs.” *Capital*, Vol. I (Penguin 1990), Appendix p. 1068. Blake: “Less than All cannot satisfy Man.” *There is No Natural Religion* (1788). Mel Gibson’s film *Apocalypto* (2006): “The deer said, The Man has all that he needs. Now his sadness will stop. But the owl replied, No. I saw a hole in the Man, deep like a hunger he will never fill. It is what makes him sad and what makes him want. He will go on taking and taking, until one day the World will say, I am no more and I have nothing left to give.”

<sup>16</sup> *Cosmic Evolution* 128.

<sup>17</sup> Heidegger: “Higher than actuality stands *possibility*.” [An ontological gradient.] “The ontological source of Dasein’s Being is not ‘inferior’ to what springs from it, but towers above it in power from the outset; in the field of ontology, any ‘springing-from’ is degeneration.” *Being and Time* (tr. John Macquarrie and Edward Robinson 1962) 63, 383.

<sup>18</sup> “All origination and all genesis in the field of the ontological is not growth and unfolding but degeneration, since everything arising arises, that is, in a certain way runs away, and removes itself from the superior force of the source.” *The Basic Problems of Phenomenology* (tr. Albert Hofstadter rev. ed. 1988) 308.

<sup>19</sup> “A steam engine, in its actual but not abstract form, is an iron fabrication, with boiler, valves, pipes, and pistons. The essence of a steam engine, though, is somewhat simpler: it consists of a hot (that is, high temperature) source of energy, a device – a piston or turbine – for converting heat into work, and a cold sink, a place for discarding any unused energy as heat.” Peter W. Atkins, *Four Laws that Drive the Universe* (2007) 50-51.

<sup>20</sup> “The ‘as’ is the basic structure whereby we understand and have access to anything.” *Logic: The Question of Truth* (tr. Thomas Sheehan 2010) 129.

<sup>21</sup> To humanize is to bovinize. See Vaclav Smil, “Planet of the Cows,” *IEEE Spectrum* April, 2017; [http://vaclavsmil.com/wp-content/uploads/2017/05/28.COWS\\_.pdf](http://vaclavsmil.com/wp-content/uploads/2017/05/28.COWS_.pdf).

“And we begin to see that we are time [*il tempo siamo noi*]. We are this space [*Siamo questo spazio*], this clearing opened up [*questa radura aperta*] by the traces of memory inside the connections between our neurons. We are memory. We are nostalgia. We are longing for a future that will not come. The clearing that is opened up in this way [*Questo spazio che viene così aperto*], by memory and by anticipation, is time: a source of anguish sometimes, but in the end a tremendous gift.”<sup>22</sup>

As does the modern consensus Rovelli associates the arrow of time with increasing entropy. He sees the phenomenon of life, also in keeping with the now-standard view, as a “network of processes for increasing entropy.” Rovelli denies what is yet maintained by some, “that life generates structures that are particularly ordered, or that locally diminish entropy: [life] is simply a process that degrades and consumes the low entropy of food; it is a self-structured disordering, no more and no less than the rest of the universe.”<sup>23</sup> And the universe “is like a mountain that collapses in slow motion. Like a structure that very gradually crumbles.”<sup>24</sup>

The ‘mountain’ is a very improbable state of things. The greater the improbability of a system the lower its entropy. “Traces of the past exist, and not traces of the future, *only* because entropy was low in the past. There can be no other reason, since the only source of the difference between past and future is the low entropy of the past.”<sup>25</sup> “[T]he existence of common causes in the past is nothing but a manifestation of low entropy in the past. In a state of thermal equilibrium, or in a purely mechanical system, there isn’t a direction to time identified by causality.”<sup>26</sup> “[M]emory, causes and effects, flow, the determined nature of the past and the indeterminacy of the future are nothing but names that we give to the consequences of a statistical fact: the improbability of a past state of the universe.”<sup>27</sup>

As for us, “We humans are **an effect** of this great history of the increase of entropy.”<sup>28</sup>

“Our present swarms with traces of our past. We are *histories* of ourselves, narratives. . . . It is memory that solders together the processes, scattered across time, of which we are made. In this sense we exist in time.” “This being between past and future events is central to our mental structure. This, for us, is the ‘flow’ of time.” “We are stories . . . oriented toward predicting events in the future, toward the direction of increasing entropy. . . . This space—memory—

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<sup>22</sup> Carlo Rovelli, *The Order of Time* (tr. Erica Segre and Simon Carnell 2018) 202.

<sup>23</sup> *The Order of Time* 164-165.

<sup>24</sup> *Id.* 166.

<sup>25</sup> *Id.* 167.

<sup>26</sup> *Id.* 169.

<sup>27</sup> *Ibid.*

<sup>28</sup> *Id.* 194. My emphasis.

combined with our continuous process of anticipation, is the source of our sensing time as time, and ourselves as ourselves.”<sup>29</sup>

His emphasis on human being as an **effect** of increasing entropy skews Rovelli’s characterization of us toward that of apperceivers of “time as time, and ourselves as ourselves.” “Perhaps the emotion of time is precisely what time *is* for us.”<sup>30</sup>

Yet we are time, *il tempo siamo noi*, fundamentally because we increase entropy by a unique pathway. We are time because we *ex-sist*: so constituted as to make sense of whatever we encounter and work it into world, Dasein’s world. Dasein’s characteristic niche-making forms a colossal heat engine; in its engagement with nature the peculiar process of ‘projection,’ ‘taking-as,’ *entworfen etwas auf/als etwas*, which we essentially are, produces entropy. *Ereignis* then designates the biosphere’s discontinuous transition (*Einbruch*) to this new kinetic regime of self-structured disordering. As Rovelli writes,

“It only takes the experience of spending time with a friend who has suffered a serious schizophrenic episode, a few weeks with her struggling to communicate, to realize that delirium [*delirio*] is a vast theatrical equipment with the capacity to stage the world, and that it is difficult to find arguments to distinguish it from those great collective deliriums of ours [*grandi deliri collettivi*] that are the foundations of our social and spiritual life, and of our understanding of the world.”<sup>31</sup>

These collective deliriums, Rovelli adds, have worked reasonably well in getting us this far. We should also note that these powerful collective deliriums – the “human prejudice” as Nietzsche’s animal calls them<sup>32</sup> – do their part to hasten the universal kenosis. Presumably delirium – the ‘storm of being’ – will persist until Dasein succeeds in destroying the conditions of its viability. Thereby Dasein contributes in its one-of-a-kind way toward that ever more probable state of the universe when “it shall have been as if nothing had happened.”<sup>33</sup>

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<sup>29</sup> *Id.* 178-179, 180, 189.

<sup>30</sup> *Id.* 201.

<sup>31</sup> *Id.* 211.

<sup>32</sup> *Ein Thier, welches reden konnte, sagte: „Menschlichkeit ist ein Vorurtheil, an dem wenigstens wir Thiere nicht leiden.“* “An animal which could speak said, ‘Humanity is a prejudice of which we animals at least are free.’” *Daybreak: Thoughts on the Prejudices of Morality* (tr. R. J. Hollingdale 1997) Book IV, § 333, p. 329.

<sup>33</sup> *wird sich nichts begeben haben.* Nietzsche, *On Truth and Lie in a Non-moral Sense*, § 1.