Orexodynamics of *Purpose and Desire*[1]

and it's one hungry will[2]

In his most extensive remarks on non-human organisms Heidegger makes a far-out claim:

> "We cannot say that the organ has capacities, but must say that the capacity has organs. . . . *The organ . . . is in a capacity's possession.* It is the capacity which possesses here rather than the organ. It is the capability which procures organs for itself, rather than organs coming to be equipped with capacities . . . [*Das Fähigsein verschafft sich Organe, nicht werden Organe mit Fähigkeiten . . . ausgestattet.*]"[3]

How to make sense of this? Heidegger was Aristotelian to the bone[4] so Aristotle's teaching is the place to start. Lack-in-matter, *sterēsis*-in-*hulē*, is the general-purpose capacity of *phusis* to take form, *eidos.* Matter in Aristotle's physics "inherently yearns for and stretches out toward [form] by its own nature [τὸ δὲ ὃ πέφυκεν ἐφίεσθαι καὶ ὀρέγεσθαι αὐτοῦ κατὰ τὴν αὐτοῦ φύσιν]."[5] Matter procures form for itself. Accordingly all human beings by nature reach out toward knowledge (what properly 'informs' human being): πάντες ἄνθρωποι τοῦ εἰδέναι ὀρέγονται φύσει.[6] Human being is the capacity, knowledge its organ.

Now consider Heidegger's question "What makes a call upon us that we should think and, by thinking, be who we are?" He says,

> "That which calls on us to think in this way presumably can do so insofar as the calling itself, on its own, needs thought [*als das Rufende selber und von sicht aus das Denken braucht*]. What calls us to think, and thus commands, that is, brings our essential nature into the keeping of thought, needs thinking [*braucht das Denken*] because what calls to us wants itself to be thought about according to its nature [*seinem Wesen nach selbst bedacht sein möchte*]. What calls on us to

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[1] J. Scott Turner, *Purpose and Desire: What Makes Something "Alive" and Why Modern Darwinism Has Failed to Explain It* (2017).

[2] *und er ein hungriger Wille ist.* Arthur Schopenhauer, *Die Welt als Wille und Vorstellung* (3. Aufl. 1859) I, § 28.

[3] Martin Heidegger, *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude* (tr. William McNeill and Nicholas Waker 1995) 221-222. 29/30 *Gesamtausgabe* 324. I have altered the translation slightly.

[4] *See,* e.g., Theodore Kisiel, *The Genesis of Heidegger's* Being and Time (1993); Thomas Sheehan, *Making Sense of Heidegger: A Paradigm Shift* (2015); Franco Volpi, *Aristotle and Heidegger* ([1984] tr. Pete Ferreira 2018): https://www.beyng.com/volpi/content .

[5] Joe Sachs, *Aristotle's* Physics: *A Guided Study* (1995) 45. *Physics* 192a.

[6] *Metaphysics* 980a. *Omnes homines natura scire desiderant.* Aquinas comments *sic naturaliter unusquisque* ***desiderat*** *scientiam* ***sicut materia formam.*** (my emphasis) Commentary on *Metaphysics A,* Lesson 1, comment 2: https://isidore.co/aquinas/Metaphysics1.htm#1 .

> think, demands for itself [*verlangt von sich*] that it be tended, cared for, husbanded in its own essential nature, by thought [*in seinem eigenen Wesen bedient, gepflegt, behütet sei*]."[7]

The calling itself is in need of thinking; the need in the calling is a *sterēsis.* Human existence is the form that the calling, like matter, reaches (calls) out to. The calling is the capacity, human being its organ for thinking. A thinking human being is an entelechy, a being-at-work-being-who-it-is.[8]

Better not to focus on the poles of the rig – matter and form, calling and thinking – and attend instead to the phenomenon arcing between them, 'purpose and desire.' The phenomenon of purpose and desire is a mode of the existential which Heidegger calls 'care,' *Sorge.* The basic structure of care is being-in-want, lack, need:

> "The structure of 'being out for something' [›*Auf-etwas-aus-sein*‹] which I do not yet have, but being-out in an already-involved-in which *eo ipso* is being out for something, brings with it the phenomenon of not yet having something which I am out for. The phenomenon of not yet having something that I am out for is called *being in want.* It is not merely a pure and simple objective not-having but is always a not-having of something that I am out for. It is what first constitutes being-in-want, lack, need. . . . this basic structure of care will lead us back to the constitution of being which we shall then come to understand as *time."*[9]

The same notion of 'being out for something' leads J. Scott Turner to wonder about a possibility we can see as 'capability crafting itself organs.' Turner asks,

> "Could it be that birds fly, not because they were the beneficiaries of lucky exaptations that enabled them to fly, but rather because, in a deep sense, the ancestors of birds *wanted* to fly? They *wanted* to glide from tree to tree, or chase after a tasty lunch, or launch themselves up trunks of trees to avoid being lunch themselves. And those wants have dragged the genes into the future in their tumultuous intentional wake. And this makes evolution at root a phenomenon of cognition, of intentionality, of purpose, of desire—of *homeostasis.* . . . what if purpose and desire are *the* fundamental attributes of anything that lives, and everything about them?"[10]

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[7] Martin Heidegger, *What is Called Thinking?* (tr. J. Glenn Gray and Fred D. Wieck 1969) 121. 8 GA 125.

[8] The kind of thinking Heidegger has in mind is to be distinguished from the varieties of means-end, calculative thinking, *rechnende Denken*, taught in classes from arithmetic to Contracts.

[9] Martin Heidegger, *History of the Concept of Time: Prolegomena* (tr. Theodore Kisiel 1985) 295. 20 GA 408-409.

[10] *Purpose and Desire* 288-289. This grand want may have got its start in behaviors pursuing everyday wants. E.g., "A febrile lizard [an infected ectotherm acquiring a fever by means of sunlight] has a high body temperature because, in some sense, it *wants* to have a high body temperature, and it acts on this desire in a way that is impossible for me [an endotherm] to do." *Id.* 68.

Heidegger also claims that "A stone never finds itself [*sich befinden*] but is simply on hand. A very primitive unicellular form of life, on the contrary, will already find itself, where this disposition [*Befindlichkeit*] can be the greatest and darkest dullness, but for all that it is in its structure of being essentially distinct from merely being on hand like a thing."[11] For instance a walking stick leaning against a door does not, strictly speaking, touch the door. Rather, "One thing can touch another only if it is a being that—as such, intrinsically, and of its ownmost being—has its world [*seine Welt hat*]. Only in that way can it touch another being, and only thus can the thing touched be uncovered [*offenbaren*] in the touching and become accessible in the being as something there [*in seinem Vorhandensein zugänglich werden*]."[12]

In the second book of his trilogy Turner shows that a fibroblast cell manifests *Bestimmtsein*, attuned-being, in which another being is indeed uncovered. In fact a fibroblast manifests a kind of proto-*Sorge*. Turner notes that "Fibroblasts are probably the commonest but the least appreciated cells in the body." He explains their function in these terms:

> "Fibroblasts ambulate along collagen fibers by gripping embedded protein footholds called fibronectins, and then pulling themselves along with tiny muscle-like proteins within the cell. Consequently, a fibroblast exerts a slight tension on any collagen fiber it occupies. Because each collagen fiber hosts numerous fibroblasts, the tiny forces from individual cells can add up to a substantial collective tension . . . Fibroblasts are also attentive to the tension on the fibers they inhabit, and will actively work to maintain it. If a bare collagen fiber is stretched, for example, tension along the entire fiber will increase, just as it will in a stretched rubber band. But if the stretched collagen fiber is populated with fibroblasts, it behaves differently: the initial high tension will slowly relax until tension is restored to what it was before. This occurs because the fibroblasts sense the elevation in the fiber's tension and respond by relaxing their grip on it, allowing the fiber to slacken back to the tension it sustained previously. It works the other way too. A slackened collagen fiber populated with fibroblasts will slowly recover its tension as the fibroblasts sense the slack and respond by pulling on the fiber more forcefully. Depopulated collagen fibers, however, will remain slack. Fibroblasts are, in fact, agents of tension homeostasis."[13]

"Attentive to," "actively work to," "sense," and "respond" together claim that a fibroblast touches another being, a collagen fiber, and the collagen fiber is 'uncovered in the touching,' becomes accessible as something there; accessible as – felt to be – tense or lax; and thereby respectively to-be-slackened, to-be-tensed. In Heidegger's terms a fibroblast 'has its world.'

Heidegger cites Karl Ernst von Baer and Jakob von Uexküll as two biologists who, long after Aristotle did, thought of non-human organisms as having a world. Nevertheless in Heidegger's

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[11] *History of the Concept of Time* 255. 20 GA 352.
[12] Martin Heidegger, *Logic: The Question of Truth* (tr. Thomas Sheehan 2010) 180. 21 GA 214.
[13] J. Scott Turner, *The Tinkerer's Accomplice: How Design Emerges from Life Itself* (2007) 33-34.

view it is clear that "whereas we may have to attribute 'having a world' to plants and animals, we can do so only insofar as we have first understood this structure as it pertains to our own existence as such." He asserts that

> "We can arrive at the biological basis of human being—i.e., the basic structure of our 'biological being' in the narrow sense—only if beforehand we have already understood 'biological being' as a structure of existence [*Daseinsstruktur*]. It does not work in reverse. We cannot derive the determination 'being-in-the-world' from biology. It must be acquired philosophically. This means that even biology *qua* biology cannot see the structures of 'biological being' in its specific objects, for *qua* biology it already presupposes such structures [of being-in-the-world] when it speaks of plants and animals. Biology can establish and determine these structures only by transgressing [*überschreitet*] its own limits and becoming philosophy."[14]

Turner's *Überschreitung* aims at understanding biological being as a structure of existence in Heidegger's sense; it seeks to establish and determine the structures of being-in-the-world in non-human biota. Turner's shorthand term for the *Daseinsstruktur* of biological being is 'purpose and desire': "life's truly distinct nature [is] its purposefulness, its intentionality, and its distinctive intelligence."[15]

The physiological basis of life's being-in-the-world is homeostasis. Turner contends that,

> "Properly understood, homeostasis is life's fundamental property, what distinguishes it from non-life. In short, homeostasis *is* life. It is a first principle that stands on its own and does not derive from any process associated with life, including its evolution."[16]

In *The Tinkerer's Accomplice* homeostasis is still ancillary to descent with modification: moment by moment homeostasis staves off the unceasing 'thermodynamic assault'[17] and thus buys time for dawdling natural selection to tinker its way down the ages. Hence the two meanings of 'adaptation' for biologists: on the one hand "a phenomenon of genetic evolution, a progressively 'good fit' over many generations between assemblages of genes and the environment in which they live. This is the tinkerer at work." On the other hand "adaptation is a physiological process, in which the 'good fit' between organism and environment is a more immediate and active affair, involving the work of thermodynamic machines that maintain the

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[14] *Logic: The Question of Truth* 181. 21 GA 215.
[15] *Purpose and Desire* 298.
[16] *Id.* 292. *Cf.* "the soul is in some way the governing source [ἀρχή] of living things." *Aristotle's* On the Soul *and* On Memory and Recollection (tr. Joe Sachs 2004) 47. *De anima* 402a 6-7. For Turner homeostasis is the *archē* equivalent to Aristotle's *psychē.*
[17] The phrase is from J. Scott Turner, *The Extended Organism: The Physiology of Animal-Built Structures* (2000) 18.

ephemeral and orderly stream of matter and energy we call an organism." In truth 'adaptation' is "the product of a conspiracy. The tinkerer has an accomplice."[18]

By the third book, *Purpose and Desire*, homeostasis is fully in charge.[19] "Darwin saw the essential truth that Lamarck also saw: that evolutionary and physiological adaptation somehow shared a common foundation." "Given that life is an ephemeral dynamic disequilibrium," Turner ponders whether "hereditary memory is too? Rather than memory being replicable object-code, as we assume the gene to be, perhaps memory is more process than object, more disequilibrium than stasis, more verb than noun." This leads to a radical idea: "that evolution is driven not by natural selection, but by *homeostasis*, and the implied striving and desire that homeostasis implies." After discussion of evidence Turner concludes that "All this makes heredity itself a form of metabolism, and metabolism, in an odd way, a form of heredity."[20]

Homeostasis does not emerge *from* natural selection; rather

> "it is homeostasis that drives natural selection, and there is nothing natural about it. What drives the course of evolution is not the soulless lottery of the gene pool, but life's striving for persistence. The striving is driven not by the luck of the lottery, but by a cognitive sense of self, even down to the smallest bacterium, even preceding, as I have argued, the emergence of life itself. A deep intelligence is at work in life, and it cannot be denied."[21]

"Wanting something is desire, and meeting wants is purpose, and both are inextricably bound up with a 'why'."[22] "[A]ll homeostasis involves a kind of wanting, an actual desire to attain a particular state, and the ability to create that state."[23] Or as Heidegger put it, "even a vegetable lives its none-too-bright life in terms of an end-for-which [*Wozu*]."[24]

For Turner the functional units of biology are always agents of homeostasis. Just as fibroblasts are agents of tension-homeostasis for collagen fibers, so also are endothelial cells agents of shear-homeostasis for blood vessels. Endothelial cells "are flexible, and so deform under shear. The endothelial cells can sense this deformation, and release various chemical factors in

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[18] *The Tinkerer's Accomplice* 13.

[19] Turner says there he is a "recovering reductionist." *Purpose and Desire* 301. Over the course of his career as a research physiologist (and his trilogy of books) Turner changed his commitment from one thema (mechanistic reductionism) to its anti-thema (vitalism). Holton observes that "The thematic commitment of a scientist typically is remarkably long-lived. But it can change. Examples are Wilhelm Ostwald, who first turned against atomism and then reversed himself once more; Planck; Einstein; and a few others." Gerald Holton, "On the Role of Themata in Scientific Thought," 188 *Science* 328, 334 (1975).

[20] *Purpose and Desire* 96, 153, 230.

[21] *Id.* 292.

[22] *Id.* 260.

[23] *Id.* 70.

[24] *Logic: The Question of Truth* 129. 21 GA 154.

response that alter the tension in the vessel's jacket of smooth muscle."[25] And so on through more examples of physiological agents of homeostasis.

The notion of agents initially appears in Turner's work at the conclusion of *The Extended Organism* where he summarizes the argument of that first book of the trilogy: "Animal-built structures . . . are the agents whereby organisms adaptively modify flows of matter and energy through the environment. . . . In such structures, organisms co-opt the environment into a physiology that extends well beyond their conventionally defined boundaries."[26]

By the final book Turner has prepared the ground to "make a bald assertion:

> bacteria (or any living system, for that matter) can be agents because they are cognitive beings . . . using 'cognition' in the broadest sense I can get away with—to mean simply the mapping of information about the external environment onto the cell's internal workings. . . . bacteria can be cognitive agents because they have embedded in their membranes a suite of cognitive mapping tools. . . . So, it seems to be cognition all the way down to the simplest life forms we know. Since cognition is an important component of agency, it follows that bacteria can be cognitive agents, as can any living system. There should be nothing controversial about this assertion, as long as we are careful to frame it correctly."[27]

'Cognitive mapping,' transduction, is Heidegger's *entwerfen etwas auf/als etwas*: taking – 'projecting' – something as something. This is the basic move of *das Verstehen*, understanding.[28] As noted above Turner has shown that cells have *Befindlichkeit*; they are attuned beings attending to aspects of their environment, sensing change and responding to change in appropriate ways. We might call the unity of attunement and understanding at that level a 'cyto-existential.'[29]

Broadly speaking Turner's bald assertion is the same Aristotle made in *De anima* and Heidegger made here and there; namely, that some – however limited – kind of *psychē*,[30] respectively 'worldedness' – however 'poor' – is found throughout living nature. Turner assembles evidence from physiology to support that assertion. Turner goes on to claim that

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[25] *The Tinkerer's Accomplice* 64.
[26] *The Extended Organism* 212.
[27] *Purpose and Desire* 180-181.
[28] "The 'as' is the basic structure whereby we understand and have access to anything." *Logic: The Question of Truth* 129. *Denn das »als« ist die Grundstruktur von Verständnis und Zugänglichkeit.* 21 GA 153.
[29] For abundant evidence that "fungi actively sense and interpret their worlds" *see* Merlin Sheldrake, *Entangled Life: How Fungi Make Our Worlds, Change Our Minds, and Shape Our Futures* (2020). For the worldedness of amoebae *see The Secret Mind of Slime* (PBS/Nova season 47, episode 12, 2020) and John Tyler Bonner, *The Social Amoebae: The Biology of Cellular Slime Molds* (2009).
[30] "So, if one needs to say what is common to every soul, it would be that it is a being-at-work-staying-itself [entelechy] of the first kind of a natural, organized body." *On the Soul* 82. *De anima* 412b: εἰ δή τι κοινὸν ἐπὶ πάσης ψυχῆς δεῖ λέγειν, εἴη ἂν ἐντελέχεια ἡ πρώτη σώματος φυσικοῦ ὀργανικοῦ.

> "intentionality is fundamentally the flip side of cognition, and you cannot really have one without the other. This is because cognitive mapping is invariably connected to engines—cells or organisms—that do work to modify the environment toward a particular—a purposeful—end. . . . Every living system has intentionality, although the intentionality can be manifest in any number of ways. An agent could change its location in space, or it could construct an environment that is more suitable to its physiology. But it happens, inevitably, and this makes life a profoundly intentional phenomenon. This might as well be acknowledged frankly."[31]

In Turner's view this is precisely what the modern evolutionary consensus – "deeply reductionist, materialist, and mechanist" – refuses to do. Turner accuses academic evolutionism of (bad) 'epistemic closure,' which we may see as a form of Heidegger's 'sclerotic tradition'[32] and Nietzsche's 'law of agreement'[33]: "Where," in Turner's version, "everyone simply agrees that we will think only one way about the universe—one form of epistemology—and not bother to engage other ways." The deleterious effect of epistemic closure is "intellectual narcissism. Those living within an epistemically closed world become so engrossed in their beautiful, self-referential, and internally consistent universe that mental discipline easily lapses into mental blindness, followed by intellectual pathology and ultimate downfall." At the limit epistemic closure brings domination and subjugation, "an increasing reliance on politically enforced orthodoxy. Narcissism demands that everyone admire the same thing, with unpleasant consequences for those who demur."[34]

Turner's vision purports to deliver us from the hegemony of modern evolutionism's epistemic closure: "No longer are we stuck in the bleak landscape of the Four Horsemen of the Evocalypse, where there is no purpose, no desire, no intention—only the indifferent churning of a machine." Instead we see a landscape "where those essential attributes of life—purposefulness, striving, desire, intentionality, intelligence—can once again reenchant our understanding of life and of everything about it, including its evolution."[35]

The enthymeme here is that purposefulness, striving, desire, intentionality, and intelligence are somehow enchanting or positive or at least unbleak, whereas the churning of machinery has none of those affects, is indifferent. Turner says we must be 'good scientists,' "coming to a

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[31] *Purpose and Desire* 181-182. Sachs glosses Aristotle: "Living things do not *have* purposes, they *are* purposes." *On the Soul* 28. *Wir selbst sind der Wille zum Leben.* "We ourselves are the will for life." Arthur Schopenhauer, *The World as Will and Presentation, Volume Two* ([3rd ed. 1859] tr. David Carus and Richard E. Aquila 2011) 272 (ch. 19).

[32] *verhärteten Tradition. Sein und Zeit* 22.

[33] *Gesetz der Uebereinstimmung*. *Die fröhliche Wissenschaft* § 76.

[34] *Purpose and Desire* 44-45.

[35] *Id.* 184-185. The Four Horsemen are William Provine, Francis Crick, Richard Dawkins, and Daniel Dennett. *Id.* vii-viii.

judgment based on the evidence presented to us."[36] Yet he presents no evidence to warrant his valuation; or rather he writes as if it is self-evident.[37] We may accept Turner's arguments for life as purpose and desire while yet, consistently, withholding assent to the conclusion of affective relief.[38]

'Consistently' because there's more than one way to ken the scat. Schopenhauer for instance – that "marginal figure"[39] who is said to have propounded a "somewhat loopy metaphysics"[40] – saw purpose and desire everywhere, and everywhere with negative valence:

> "Namely, when that veil of Maya, the *principium individuationis*, is so greatly lifted from the eyes of a person that he no longer makes the egoistic distinction between his own person and others, but participates as much in the suffering of other individuals as in his own, . . . then it follows of itself that such a person – who recognizes his innermost and true self [i.e. *Wille*] in all beings – must also regard the endless sufferings [*die endlosen Leiden*] of all living things as his own, and so appropriate the entire world's pain [*den Schmerz der ganzen Welt*]. . . . He is cognizant of the whole, apprehends its essence, and finds it in the grip of a steady passing, vain striving, inner conflict, and constant suffering [*in einem steten Vergehn, nichtigem Streben, innerm Widerstreit und beständigem Leiden*

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[36] *The Tinkerer's Accomplice* 7.

[37] Perhaps because "when it comes to the ultimate questions, the great problems of science and life . . . we are all ruled by proclivities that go to the root of our very being [*innerlich tief begründeten Vorlieben*], and in our speculations we unwittingly play into their hands." Sigmund Freud, "Beyond the Pleasure Principle," tr. John Reddick in *The Penguin Freud Reader* (ed. Adam Phillips 2006) 188. Turner's persona is upbeat, positive, optimistic.

[38] Turner ***does not*** argue for intelligent design anywhere in his trilogy. (Although he thinks such arguments have been unfairly suppressed. *See* J. Scott Turner, "Signs of Design," 124 *The Christian Century* 18 (2007); https://www.esf.edu/EFB/turner/publication%20pdfs/Signs%20of%20design%20distribution.pdf .) Nevertheless apposite here is Hume's observation that the argument for intelligent design does not get its proponents where they want it to get them. Hume pleads a demurrer: Granted, the evidence points to intelligent design; but you cannot infer from that evidence the character (e.g. goodness) or motives (e.g. love) of the designer. So far as the evidence shows the designer may be a very sick thing indeed. *See* David Hume, *An Enquiry concerning Human Understanding*, Section 11: https://davidhume.org/texts/e/11 . Or a doofus tyro; *see* Gary Larson's cartoon, "God as a kid tries to make a chicken in his room."

[39] "If one excludes a few Gnostics, the odd skeptic, and marginal figures like Schopenhauer, few philosophers or religious thinkers in the West have not been guided by it [epistemic optimism], at least as a tacit ideal." Raymond Geuss, "Thucydides, Nietzsche, and Williams" in *Outside Ethics* (2005) 224.

[40] "The will lies behind all, contains all, is [she's quoting him now] 'the thing-in-itself . . . the innermost essence, the kernel, of every particular thing and also of the whole,' a somewhat loopy metaphysics that real academic philosophers, like Tamsin [Shaw?], must take with a large pinch of salt, though it has captivated artists for generations." Zadie Smith, "Windows on the Will," 63 [No. 4] *The New York Review of Books* March 10, 2016 (reviewing *The Polar Express, Anomalisa,* and Schopenhauer's *The Suffering of the World* (a selection from *Parerga und Paralipomena*)): https://www.nybooks.com/articles/2016/03/10/windows-on-the-will/ . 'Tell me which metaphysics you think is **not** loopy and I'll tell you who you are.' *Sage mir, was du vom übersetzen hältst, und ich sage dir, wer du bist.* Martin Heidegger, *Hölderlins Hymne »Der Ister«* [1942]. 53 GA 76.

> *begriffen*]; he sees, wherever he looks, human suffering and animal suffering, and a vanishing world [*hinschwindende Welt*]."[41]

Schopenhauer published *Die Welt als Wille und Vorstellung* in 1818; i.e. three years before Sadi Carnot first laid eyes on a steam engine, and four years before Rudolf Clausius was born; therefore too soon for thermodynamics to inform his thinking.[42] Yet had he come to know the Second Law he might have taken it to confirm his vision, and with some justification. How's that?

As a physiologist Turner is *eo ipso* a thermodynamicist. "All physical systems," he writes, "tend to go naturally from instability to stability, and it is the Second Law of Thermodynamics that tells us so."[43] The Second Law "is also known as the law of increasing entropy. . . . whenever energy does work—whether the system does work on the surroundings, or vice versa—some fraction of the energy is lost to random molecular motion, or entropy (sometimes referred to as 'disorder'). . . . The Second Law demands only that the universe experience a *net* increase of entropy. Organisms, which are highly ordered systems that can be thought of as transient 'pools' of low entropy, exist only by disordering the universe in which they exist."[44] Thus "thermodynamically favored fluxes"[45] wage the constant "thermodynamic assault" which homeostasis must resist: "we can now state a minimum physical requirement for homeostasis: homeostasis requires that the thermodynamically favored flux always be matched exactly by an equal and oppositely directed physiological flux."[46]

Organisms appear to be thermodynamic anomalies insofar as they 'go against the flow' by warding citadels of thermodynamic *in*stability, *dis*equilibrium, structure. How then can the Second Law permit them to exist? Turner notes that "Energy flowing through open dynamic

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[41] Arthur Schopenhauer, *The World as Will and Presentation, Volume One* ([3rd ed. 1859] tr. Richard E. Aquila in collaboration with David Carus 2008) 439 (Book IV, § 68).

[42] A thinking which never essentially changed. "The book was published at the end of 1818 but its fundamental ideas had been in Schopenhauer's head for about four years and can be said to have been fully formed by 1816 at the latest. In 1816 Schopenhauer was 28. Now everything he subsequently wrote was elaboration or confirmation of or comment on the philosophy of *The World as Will and Idea*: he adds nothing and subtracts nothing. The mind of the man of 70 is wholly occupied with the ideas of the man of 28: he has acquired more knowledge but nothing he has subsequently learned has induced him to change his mind in any particular." R. J. Hollingdale, Introduction to Arthur Schopenhauer, *Essays and Aphorisms* (tr. Hollingdale 1970) 23-24. "Every thinker thinks one only thought." *What is Called Thinking?* 50. *Jeder Denker denkt nur einen einzigen Gedanken.* 8 GA 53. Thus Schopenhauer in the Preface to the first edition of *WWP*: "What is to be communicated through [the book in hand] is a single thought." *Was durch dasselbe mitgetheilt werden soll, ist ein einziger Gedanke.*

[43] *Purpose and Desire* 18.

[44] *The Extended Organism* 12.

[45] "Matter and energy flow down . . . potential energy differences spontaneously, in conformity with the dictates of the Second Law. Consequently, we will call these kinds of fluxes thermodynamically favored fluxes (*TFFs*)." *Id.* 34.

[46] *Id.* 184.

systems often imposes orderliness on them." Think of hurricanes, tornadoes, and dust devils forming in the fluid that is atmosphere. That these structures come into being at all seems paradoxical—why doesn't the thermal energy of the Gulf, or Kansas, or the plains of Mars just dissipate straight up toward the cold of space? Making the trip by whirligig seems a long way around the barn. "Our cultural heritage," write Schneider and Sagan, "leads us to assume that the quickest route from point A to point B is a straight line. But the Tornado in a Bottle's most effective way to go from full to empty is by way of a whirlpool—a complex, cycling structure that would never be expected on the basis of random positions of water molecules."[47] So, as Turner continues, "There is nothing magical about this; the orderliness [structure] is simply the fastest way to hurry energy through the standing wave."[48]

For this revelatory proposition Turner cites a 2009 paper by Rod Swenson advocating 'the Law of Maximum Entropy Production.'[49] As Ulanowicz and Hannon wrote in 1987: "It appears that living communities serve to augment the rate of entropy production over what it would be in the absence of biota."[50] The Royal Society devoted an entire issue (17 papers) of its *Transactions* to the subject in 2010. The gist: "thermodynamic processes far from thermodynamic equilibrium will adapt to steady states at which they dissipate energy and produce entropy at the maximum possible rate."[51] Although "the universe does not like order"[52] nevertheless "order production is inexorable because order produces entropy faster than disorder."[53]

Life exists for the sake of faster entropy production. Living things are organs of nature's capacity to dissipate itself. In terms of Aristotle's schema, nature lacks repose, stability (the stability of absolute cold, motionless being, οὐσία ἀκίνητος[54]); repose is the form it stretches out toward – thermodynamically flows toward – but never reaches (to date anyway). In Heidegger's terms, 'What (proximally) calls for thinking' is distally 'What calls for radiating as the fourth power of one's absolute temperature.'

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[47] Eric D. Schneider and Dorion Sagan, *Into the Cool: Energy Flow, Thermodynamics, and Life* (2005) 131-132.
[48] *Purpose and Desire* 249.
[49] "The Fourth Law of Thermodynamics or the Law of Maximum Entropy Production," 18 *Chemistry* 333 (2009).
[50] R. E. Ulanowicz and B. M. Hannon, "Life and the Production of Entropy," 232 *Proceedings of the Royal Society of London. Series B, Biological Sciences* 181 (1987).
[51] Axel Kleidon, Yadvinder Malhi, and Peter M. Cox, "Introduction: Maximum entropy production in environmental and ecological systems," 365 *Philosophical Transactions of the Royal Society of London: Biological Sciences* 1297 (2010).
[52] *The Extended Organism* 17.
[53] Mayo Martínez-Kahn and León Martínez-Castilla, "The Fourth Law of Thermodynamics: The Law of Maximum Entropy Production (LMEP); An Interview with Rod Swenson," 22 *Ecological Psychology* 69 (2010).
[54] *Metaphysics* 1026a: "If there is no being (*ousia*) other than formed by *phusis*, then *phusika* [*epistēmē*] would be the first science. If there ***is*** some motionless being (*tis ousia akinētos*) the science of ***that*** would be more fundamental than *phusika*, and would be first philosophy." Aristotle thought that motionless being 'is really a thing,' and that it draws all nature to it by love. In the thermodynamic view nature behaves as though motionless being is precisely what is lacking in the universe and so strives to bring about.

So back to Schopenhauer. It's as if he stripped out matter from Aristotle's concept of the hypokeimenon but – evidently much taken with Spinoza's *conatus*[55] – retained lack, wanting, and reaching; which remainder Schopenhauer calls 'will.' Will is "the striving [*das Streben*] that constitutes the innermost being of every thing."[56] Included in 'every thing' are gravity, electromagnetism, planets, crystals, solids, liquids, animals, plants, and human beings; 'every thing' means all nature. Will manifests – in Aristotle's terms 'takes form' – as phenomena; the entitization which Schopenhauer calls the *Objektität* or *Objektivization* of will. While its phenomena can have purpose, will itself has none. "On all the levels of its phenomenon [*seiner Erscheinung*] from the lowest to the highest, will is entirely devoid of an ultimate goal and purpose [*eines letzten Zieles und Zweckes*]."[57] "[T]he absence of all goals, of all boundaries, belongs to the essence of will itself, which is an endless striving [*ein endloses Streben*]."[58] "Every individual [human] act has a purpose, the whole process of willing has none. . . . every single natural phenomenon . . . is a level in the process of appearance of the thing in itself, of groundless willing [*des grundlosen Willens*]."[59] Will is "always striving [*immer strebt*] because striving is its sole essence [*Streben sein alleiniges Wesen ist*], to which no end is put by the achievement of any goal, which is therefore capable of no final satisfaction but can only be held up by impediments, but in itself proceeds *ad infinitum*."[60]

Schopenhauer is fond of the trope of 'service,' 'servitude.' "[O]riginally and in its essence, cognition is altogether in the service of will."[61] Moreover, "cognizance remains as a rule always subject to the service of will, having arisen indeed for the sake of this service . . . In animals this subservience of cognizance to the will can in no way be eliminated. In human beings, the elimination occurs only as an exception."[62]

This exceptional case, in its *Aufhebung* of will, incarnates Schopenhauer's soteriology. Will "considered purely in itself, is incognizant and only a blind ceaseless pressing [*erkenntnißlos und*

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[55] *Conatus, quo unaquaeque res in suo esse perseverare conatur, nihil est praeter ipsius rei actualem essentiam.* Benedictus de Spinoza, *Ethica* (1677) Pars Tertia, Propositio VII. "[T]he notion of *conatus*, or individual self-maintenance, of which there is no equivalent in Descartes or in purely mechanical and atomistic cosmologies, is exactly the concept which biologists have often demanded as essential to the understanding of organic and living systems." Stuart Hampshire, *Spinoza and Spinozism* (2005) 68. *Conatus* = homeostasis.

[56] *WWP I* 363 (Book IV § 56).

[57] *Id.* 362.

[58] *Id.* 208 (Book II § 29).

[59] *Id.* 209.

[60] *Id.* 362-363 (Book IV § 56).

[61] *Id.* 219 (Book III § 33). *Ursprünglich also und ihrem Wesen nach ist die Erkenntniß dem Willen durchaus dienstbar.*

[62] *Id.* 220. *Dem Dienste des Willens bleibt nun die Erkenntniß in der Regel immer unterworfen, wie sie ja zu diesem Dienste hervorgegangen . . . Bei den Thieren ist diese Dienstbarkeit der Erkenntniß unter dem Willen gar nie aufzuheben. Bei den Menschen tritt solche Aufhebung nur als Ausnahme ein . . .*

nur ein blinder, unaufhaltsamer Drang]."[63] Will does not know what it wants, what it lacks ("all striving arises from a lack, from discontent with one's state"[64])—until, after eons of groping about in the dark, will 'objectivates' in human being and, like Skynet, becomes self-aware.[65] Only in a fully cognizant human being does will at last learn what it lacks and what it wants: it lacks repose, it wants surcease. The exceptional human being thus becomes a quieter, *Quietiv*, of the will, thereby to "end the suffering that is inseparable from its phenomenon."[66]

Schopenhauer was struck by the same impression from human suffering that now strikes Adam Phillips: "it is indeed shocking what people will put up with; it is astounding how few people kill themselves."[67] Why do people go on? Our attachment to life, Schopenhauer believed, "cannot be grounded in its *object*, since life . . . is really constant suffering;" or at least, in an image he likes, "a business that does not cover the costs."[68] The will for life must be blind and senseless,

> "for only a blind, not a sighted, will could put itself in the position in which we see ourselves. A sighted will would rather have soon calculated that the business does not cover the costs, in that so forceful a striving and struggling, with the exertion of all one's powers, in constant concern, anxiety, and hardship, and with the inevitable destruction of every individual life, finds no compensation in an existence itself so hard fought and ephemeral, turning to naught in our hands."[69]

Schopenhauer might have felt his view corroborated by the discovery that the life of each organism serves nature's enterprise of self-liquidation: the organism exists *for the sake of* not covering the costs. For the Second Law demands, as Turner explains, that nature receive a measure of entropy exceeding the cost of production:

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[63] *Id.* 326 (Book IV § 54).
[64] *Id.* 364 (Book IV § 56). *alles Streben entspringt aus Mangel, aus Unzufriedenheit mit seinem Zustande*.
[65] "attain[ing] for the first time to reflective awareness; [will] then marvels at its own works and asks itself what it is." *WWP II* 182 (ch. 17).
[66] *WWP I* 465 (Book IV § 69). Too bad the fix won't stick. For although fully cognizant will now understands the problem and its solution, will in all its other phenomena has yet to get the memo: "We may nonetheless not suppose that, after the occurrence of denial of the will by way of cognizance becoming its quieter, it now no longer wavers, and one can rest upon it as upon acquired property. Rather, it must be won by constant battle ever anew. For since the body is the will itself, only in the form of objectivization, or as a phenomenon in the world as presentation, as long as the body lives the entire will for life also still exists as a potentiality, and constantly strives to enter into actual reality and flame anew with the entirety of its glow. Therefore, in the life of saintly persons, we find the depicted repose and blessedness only as the blossom that proceeds from constant overcoming of the will, and see the constant battle with the will for life as the ground from which it sprouts; **for lasting repose can be had by no one on earth**." *Id.* 454 (Book IV § 68) (my emphasis).
[67] Adam Phillips, "On Giving Up," 44 [No. 1] *London Review of Books* 6 January 2022: https://www.lrb.co.uk/the-paper/v44/n01/adam-phillips/on-giving-up .
[68] *WWP II* 271 (ch. 19).
[69] *Id.* 644 (ch. 46).

> "[I]n any universe where there is work being done, there will be a relentless increase in the universe's entropy. It is important to remember that the Second Law does not force increase of entropy on either the system or the surroundings. Likewise, there is nothing in the Second Law that prevents a decrease in entropy (or an increase in order) in some *part* of the universe. Any decrease in the entropy of one part must be accompanied by a greater increase in the entropy of another part, however. The Second Law demands only that the universe experience a *net* increase of entropy."[70]

The Second Law demands that everything, as the price of existence, collaborate in nature's self-dissipation, the faster the better. This demand 'objectivates' in all natural processes and thus in homeostasis. As all homeostasis is constrained to serve it in this way the Second Law operates as Schopenhauer's metaphysical *Wille.* Most importantly, homeostasis – purpose and desire – plays its small part toward the eventual quieting of the Second Law's demand; not to destroy the Law but to fulfill it, that *ultimandum* of nature "when it will have been," Nietzsche says, "as if nothing had happened."[71]

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[70] *The Extended Organism* 12.
[71] *wenn . . . wird sich nichts begeben haben. Ueber Wahrheit und Lüge im aussermoralischen Sinne* § 1.