A genealogy of meaning—notes on *The Machines of Evolution and the Scope of Meaning*

if the genealogist refuses to extend hs faith in metaphysics, if he listens to history, he finds that there is 'something altogether different' behind things: not a timeless and essential secret, but the secret that they have no essence or that their essence was fabricated in a piecemeal fashion from alien forms.[1]

We can now assemble the ingredients that lead to semiosis.[2]

"Astonishing!" exclaims Thomas Sheehan, "Things Make Sense!" (The surprising fact C is observed.[3]) With the appearance of human being, he says,

> "meaning dawned in the universe, and nothing has been the same since. For the first time in the 13.7 billion years of the cosmos, things were no longer just 'out there' but instead became meaningfully present (*anwesend*). As far as we know, only human beings can question things, recognize them for what they are in themselves, name them, talk about them in soliloquy or dialogue, and even talk about that talking. Once man is possessed by the Promethean fire of intellect and language, human history begins as a complex unfolding of meaningful lives."[4]

By this remark Sheehan paraphrases and supplements Heidegger's claim (in 1929) that "With the existence of human beings there occurs an irruption into the totality of beings, so that now the being in itself first becomes manifest, i.e., as being, in varying degrees, according to various levels of clarity, in various degrees of certainty."[5] Because Sheehan's paradigm for interpreting

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[1] Michel Foucault, "Nietzsche, Genealogy, History" in *The Foucault Reader* (ed. Paul Rabinow 1984) 78. *Que derrière les choses il y a «tout autre chose» : non point leur secret essentiel et sans date, mais le secret qu'elles sont sans essence, ou leur essence fut construite pièce à pièce à partir de figures qui lui étaient étrangères.* "*Nietzsche, La Généalogie, L'Histoire*" in *Hommage à Jean Hyppolite* (ed. Suzanne Bachelard 1971) 148.

[2] Gary Tomlinson, *The Machines of Evolution and the Scope of Meaning* (Zone Books 2023) 156 [*MESM*].

[3] "The surprising fact, C, is observed; But if A were true, C would be a matter of course, Hence, there is reason to suspect that A is true." *Collected Papers of Charles Sanders Peirce; Volume V, Pragmatism and Pragmaticism* (ed. Charles Hartshorne and Paul Weiss 1965) para. 189, p. 117.

[4] Thomas Sheehan, "Astonishing! Things Make Sense!", 1 *Gatherings* 1 (2011). https://www.beyng.com/papers/Gatherings2011-01Sheehan.html#2 .

[5] Martin Heidegger, *Kant and the Problem of Metaphysics* (5th ed. enlarged tr. Richard Taft 1997) 160. *Mit der Existenz des Menschen geschieht ein Einbruch in das Ganze des Seienden dergestalt, daß jetzt erst das Seiende in je verschiedener Weite, nach verschiedenen Stufen der Klarheit, in verschiedenen Graden der Sicherheit, an ihm selbst, d.h. als Seiendes offenbar wird. Gesamtausgabe Band* 3: 228: https://www.beyng.com/gaselis/?vol=3.00&pg=228 .

Heidegger takes 'being' as 'meaningful presence,' *Anwesen,*[6] we can read a key passage from *Being and Time* to say:

> "Everything we talk about, everything we have in view, everything towards which we comport ourselves in any way, is meaning; what we are is meaning, and so is how we are. Meaning lies in the fact that something is, and in its meaning as it does; in Reality; in presence-at-hand; in subsistence; in validity; in Dasein; in the 'it grants' [*im »es gibt«*]."[7]

So, the astonishing fact C — meaningful presence — is observed.   'But if A were true then C would be a matter of course.' Solve for A*.*

Thus "The single issue that drove Heidegger's work," as Sheehan puts it, "was not being-as-meaningful-presence but rather the *source or origin* of such meaningful presence—what he called *die Herkunft von Anwesen.*"[8]

In the letter to Richardson Heidegger describes the character of his thematic commitment.[9] At the age of eighteen, so the old Heidegger tells the story, he was handed a text *On the Manifold Meanings of Being in Aristotle*. He writes of this experience,

> "On the title page of his work, Brentano quotes Aristotle's phrase: τὸ ὄν λεγέται πολλαχῶς. I translate: 'A being becomes manifest (sc. with regard to its Being) in many ways.' Latent in this phrase is the *question* that determined the way of my thought: what is the pervasive, simple, unified determination of Being [*durchherrschende einfache, einheitliche Bestimmung von Sein*] that permeates all of its multiple meanings [*alle mannigfachen Bedeutungen*]? This question raised others: What, then, does Being mean? To what extent (why and how) does the Being of beings unfold in the four modes which Aristotle constantly affirms, but whose common origin [*gemeinsamen Herkunft*] he leaves undetermined? . . . How can they [sc. the philosophical tradition's disparate

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[6] "As a phenomenologist, Heidegger understands *Sein* in all its historical incarnations as the *meaningful presence* (*Anwesen*) of things to human beings—that is, as the changing *significance* of things within various contexts of human interests and concerns. . . . Metaphorically speaking, as thrown-open (i.e. appropriated), human being is the 'open space' or clearing within which the meaningful presence of things can occur. (The previous sentence is Heidegger's philosophy in a nutshell.)" Thomas Sheehan, *Making Sense of Heidegger: A Paradigm Shift* (2015) xiv, xv:
https://drive.google.com/file/d/0B2zuyt5_UZUqZ05hVktjWEZpVzA/view?resourcekey=0-EvceacpZnWhPZvFXn162XA . Thanks to Prof. Sheehan for placing this essential text online.
[7] Martin Heidegger, *Being and Time* (tr. John Macquarrie and Edward Robinson 1962) 26; translation modified. *Sein und Zeit* 6-7.
[8] *Making Sense of Heidegger* xv.
[9] In Holton's sense. *See* Gerald Holton, "On the Role of Themata in Scientific Thought," 188 *Science* 328 (1975); Gerald Holton, *Thematic Origins of Scientific Thought: Kepler to Einstein* (rev. ed. 1988).

names for Being, its multiple meanings] be brought into comprehensible accord [*in einen verstehbaren Einklang*]? This accord cannot be grasped without first raising and settling this question: whence does Being as such (not merely beings as beings) receive its determination [*Bestimmung*]?"[10]

This thematic commitment to pervasive, simple unity as fundamental crops up everywhere in Heidegger's texts. E.g., "The phenomenon of the 'as'-structure is manifestly not to be dissolved or broken up 'into pieces'."[11]

> "What we 'first' hear is never noises or complexes of sounds, but the creaking waggon, the motor-cycle. We hear the column on the march, the north wind, the woodpecker tapping, the fire crackling. It requires a very artificial and complicated frame of mind [*einer sehr künstlichen und komplizierten Einstellung*] to 'hear' a 'pure noise'."[12]

> "Acts of directly taking something, having something, dealing with it 'as something,' are so original [*so ursprünglich*] that trying to understand anything without employing the 'as' requires (if it's possible at all) a peculiar inversion of the natural order [*einer besonderen Umstellung*]. Understanding something without the 'as'—in a pure sensation, for example—can be carried out only 'reductively,' by 'pulling back' from an as-structured experience. And we must say: far from being primordial [*so wenig etwas Elementares*], we have to designate it as an artificially worked-up act [*eine künstlich präparierte*]."[13]

Such an artificial act of reduction shows that as-structured experience is the primary one, *das Primäre ist*, because the reductive move is possible "only as the privation of an as-structured experience. It occurs only *within* an as-structured experience and by prescinding from the 'as'—which is the same as admitting that as-structured experience is primary, since it is what one must first of all prescind from."[14]

As-structured experience is primary in that it is the top-level mode, what we always already are immediately, sense-makers. It is not primary as the ultimate ground, the *prius*, of meaningful presence. For, Heidegger asks, "is a primordial analytic [*eine ursprüngliche Analytik*] for it [the phenomenon of the as-structure] thus ruled out? Are we to concede that such phenomena are

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[10] Martin Heidegger's Preface to William J. Richardson, S.J., *Heidegger: Through Phenomenology to Thought* (4th ed. 2003) x-xi.
[11] *Being and Time* 192. *Sein und Zeit* 151: *Dieses Phänomen ist offenbar nicht »in Stücke« aufzulösen.*
[12] *Id.* 207; *Sein und Zeit* 163-164.
[13] Martin Heidegger, *Logic: The Question of Truth* (tr. Thomas Sheehan 2010) 122. GA 21: 145: https://www.beyng.com/gaselis/?vol=21.00&pg=145 .
[14] *Ibid.*

'ultimates' [»*Letztheiten*«]?"[15] No. Per Sheehan, "Being (*Sein*) in *all* its incarnations is the topic of metaphysics. Heidegger, on the other hand, is after the essence or source of being [meaning] and thus the ground of metaphysics."[16]

And he believed he had found it. By Sheehan's count Heidegger used eight principal names ("and there are yet others")*,* including *Ereignis, die Lichtung,* and *das Offene*, for this source or origin, i.e., that which possibilizes meaningful presence.[17] And with these names the road of inquiry must end. As Sheehan describes the situation:

> "We will never get an answer to the question 'What possibilizes that which possibilizes everything?' Even to ask that question is a fool's errand insofar as it traps us in a *petitio principii,* a begging of the question—in this case, not realizing that we are already wrapped up from the outset in what we are attempting to find. [. . . T]hus, to seek the ultimate basis for intelligibility already presupposes the ultimate basis of intelligibility and thus is caught in circular reasoning. Everything is knowable except the reason why everything is knowable [*sc.* 'takeable as']."[18]

Sheehan says something to this effect six times in *Making Sense of Heidegger.*[19] Evidently he does not mean to 'block the way of inquiry;' rather, he wants us to see that there **is no way** to inquire around or beyond or past the clearing.   Katherine Withy doesn't buy it:

> "If the ultimate basis of being intelligible . . . is presupposed by the quest to find it, why does it follow that the quest is doomed? That aiming to understand the ground of x presupposes the ground of x is either a harmless circularity or a bland triviality. It is blandly trivial if the point is that the quest to find the ground of x presupposes that x obtains and possesses a ground. This is an ordinary condition of seeking a ground rather than a question-begging move. It is harmlessly circular if what is presupposed is not the fact of x and its ground but instead some grasp of it on the part of the seeker. This is merely the fact that '[e]very seeking gets guided beforehand by what is sought' (SZ: 5)—which, as Heidegger argues, is simply a feature of hermeneutic understanding and not a vicious circularity (SZ: 8)."[20]

Withy's intervention keeps Tomlinson's book off phenomenology's Index of Wrong-headed Research so that we may avail ourselves of whatever light his effort sheds on *die Sache selbst.*

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[15] *Being and Time* 192. *Sein und Zeit* 151.
[16] *Making Sense of Heidegger* 10.
[17] *Id.* xv.
[18] *Id.* 228.
[19] At 76, 115, 159, 193, 227, and 228.
[20] Katherine Withy, *Heidegger on Being Self-Concealing* (2022) 112.

For the goal of Tomlinson's work is the same as that of Heidegger's, *die Herkunft von Anwesen.* Something Tomlinson calls a semiotic machine is "the linchpin of the book . . . for the signs it generates are the source of meaning in the world."[21] Tomlinson's thematic commitment, obviously enough, is to mechanism, and also to semiotic atomism: his book's Section 2 is titled 'Atoms of Aboutness.'[22]

Tomlinson joins Claude Shannon's theory of information[23] with C. S. Peirce's theory of signs[24] to launch an evolutionary-physiological account of the emergence of this fourth, semiotic, machine.   "These three machines (natural selection, niche construction, and mediation) are defining dynamics of all life-forms.   From their machinations over several billion years the conditions arose under which a fourth abstract machine fell into place: a semiotic machine that creates meaning."[25]   Natural selection:—"Given a set of organisms with varied inheritance and limited affordances, selection is set in motion."   Niche construction:—"Given the impact of organisms on their environments and the role of environment in selection, feedback interaction between constructed niches and organisms will spring into operation, altering selection possibilities."   Mediation:—"Given the constraints on the reliability of information transmission, material infrastructures for it will form and sprout rhizomatic networks connected to other infrastructures."[26]   Thus the program:

> "These abstract machines go far to describe the processes basic to all life.   And in most life-forms, in fact, they are in principle adequate to circumscribe *all* the informational complexities involved and the whole story of their historical emergence.   Something more is needed, however, to understand the further

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[21] *MESM* 26.

[22] "We can think of signs," he writes there, "as the atomic units of aboutness, underpinning meaning the way atoms underpin matter. Like atoms, on close scrutiny signs reveal no simple presence but a dynamic substructure, and detailing this has involved sign theorists, or semioticians, in reasoning sometimes as arcane as particle physics, if without so much math." *MESM* 40.

[23] Information, in Shannon's view, "is the correlation of a state at one place or moment (the source) with another state at another place or moment (the destination), a correlation **brought about by a causal connection between the two**." *MESM* 47, my emphasis. "All information is causal." *Id.* 111. Anomaly: If particles A and B are quantum-entangled, we can instantaneously induce, so to speak, the very remote particle B to have a given property by observing that the nearby particle A has the complementary property, even though they're "further apart than any causal signal can travel in the time." (Graham Priest) There is no known means, channel, infrastructure, etc. by which information about 'property' gets from A to B; no signal moving between the two. Explainer here: https://www.youtube.com/watch?v=Lsrx-u_QS7g .

[24] Peirce (1907): "A sign endeavors to represent, in part at least, an Object, which is therefore in a sense the cause, or determinant, of the sign. . . . But to say that it represents its Object implies that it affects a mind, and so affects it as, in some respect, to determine in that mind something that is mediately due to the Object. That determination of which the immediate cause, or determinant, is the Sign, and of which the mediate cause is the Object may be termed the *Interpretant*." *MESM* 62. Conjecture: Interpretant is for Peirce what *Anwesen* is for Heidegger. Peirce's 'ground' is then Heidegger's *Ereignis.*

[25] *MESM* 25.

[26] *Id.* 106.

emergence of meaning in some life-forms: another abstract machine, this one conducing in its processes to sign-making — a semiotic machine."[27]

Tomlinson's book is "a study of the conditions under which this creation [meaning] came into the world." Peirce shows a way. The sign, says Peirce, stands for its object "not in every respect, but in reference to a sort of idea, which I have sometimes called the *ground* of the representamen [sign]." According to Tomlinson Peirce took 'ground' here to be "something like an idea, a mind, or deep-formed habits of mind." In a 'post-Peircean' view Tomlinson takes 'ground' to be the fourth element of the sign; not as part of the sign itself "but instead the conditions of cognition it depends upon—an infrastructure;" i.e., biologically "evolved processes in certain cognitive entities—entities exploiting a neural network—that mesh to form an interpretant."[28] Signs require, Tomlinson writes,

> "in addition to this sign/object relation, perceptual and cognitive processes that isolate aspects of potential objects according to aspects of potential sign vehicles. This correspondence is the interpretant, in which animals register the aspectual relation of object to vehicle according to the constraints exercised by both. The capacities to form interpretants — advanced attentional focus and its recursive parsing of the world, episodic memory, and learning abilities associated with it — are prerequisites for semiosis, rare attributes distributed through one or several corners of the animal world."[29]

Probably distributed only among birds and mammals, and in only a relative handful of their species. Tomlinson assembles evidence to show that certain lineages of songbirds form and respond to interpretants as indexes, whereas honeybees neither form nor respond to interpretants at all.

Tomlinson concludes the book with three sets of outstanding questions concerning evolution, technology (with a discussion of Heidegger's view), and culture. His book stimulates a fourth question, the 'why' of meaning:—why is there meaning at all rather than simply *Sinnlosigkeit*? Heidegger held that the clearing is ultimately *ohne Warum*, 'without why.' Another dead end.

A research program that got started toward the close of the last century suggests an answer that fits with Tomlinson's machine-thema. Tomlinson is well aware of thermodynamics and mentions it at several points in the book, but he never names it for what it is, the machine that possibilizes living organisms in the first place. If we take thermodynamics as the ground machine, so to speak, then we may get nearer to glimpsing the why of sense-making.

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[27] *Ibid.*

[28] *Id.* 21, 57, 135, 57, 135.

[29] *Id.* 181.

Here's the thesis of the research program: "The proposed principle of maximum entropy production (MEP), based on statistical mechanics and information theory, states that thermodynamic processes far from thermodynamic equilibrium will adapt to steady states at which they dissipate energy and produce entropy at the maximum possible rate."[30]

Specifically relevant to the question of 'why meaning?':—"It appears that living communities [rhizomatic networks of thermodynamic processes far from thermodynamic equilibrium] serve to augment the rate of entropy production over what it would be in the absence of biota."[31] This is clearly the case If we take a measure called the free energy rate density (Φ_m) as proxy for the rate of entropy production. The Earth's non-biotic climasphere (the lower atmosphere and upper ocean) has a Φ_m of roughly 75 ergs per second per gram. Whereas Φ_m for the biotic process of photosynthesis is roughly 900 ergs/second/gram. Two decades ago Chaisson wrote: "Today's ~ 6 billion [human] inhabitants utilise ~ 18 trillion watts to keep our technological culture fueled and operating . . . The cultural ensemble equalling the whole of humankind then has a Φ_m value of some 5×10^5 erg s^{-1} g^{-1}." (And as of 2022 "The total mammal biomass [of the planet] is overwhelmingly dominated by livestock (≈630 Mt) and humans (≈390 Mt)."[32]) Chaisson speculated that probably, in a relative sense, "physical evolution is sluggish, biological evolution moderate, and cultural evolution rapid [because] Φ_m is a kind of motor of evolution (or at least its fuel), accelerating systems' ability to assimilate increased power densities."[33]

We can state the conjecture resulting from the above considerations by adapting a remark of Rod Swenson's:—semiosis is plausible[34] because semiotic life produces entropy even faster than

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[30] Axel Kleidon, Yadvinder Malhi, and Peter M. Cox, "Maximum entropy production in environmental and ecological systems," 365 *Phil. Trans. R. Soc.* 1297 (2010).

[31] R. E. Ulanowicz and B. M. Hannon, "Life and the production of entropy," 232 *Proc. R. Soc. Lond. B* 181 (1987).

[32] Lior Greenspoon *et al.*, "The global biomass of wild mammals," 120 *Proc. Nat'l Acad. Sci. USA* 1073 (2023).

[33] Eric J. Chaisson, *Cosmic Evolution: The Rise of Complexity in Nature* (2001) 132-138. *Cf.*: "Ecologically . . . powerful entities are large, fast, wide-ranging, rapidly metabolizing units capable of exerting strong forces, storing and regulating resources, and responding appropriately to a wide variety of circumstances. Power makes for prolific producers and demanding consumers with a wide reach. . . . Economic success depends on absolute performance, and very often—in human-economic contexts as well as the evolutionary marketplace—high levels of performance go hand in hand with reduced efficiency [i.e., relatively greater entropy production]. . . . Increases in power, however, are sufficiently beneficial that considerations of efficiency are secondary, especially if productivity also benefits the supply of raw necessities. In such cases, absolute performance is far more important than efficiency." Geerat J. Vermeij, *Nature: An Economic History* (2004) 124, 125.

[34] "Novelty by definition is always a surprise, but when the surprise is too great, it is completely implausible. The plausibility of life rests on the plausibility of generating novelty, and that in turn rests on mechanisms newly uncovered in biology." Marc W. Kirschner and John C. Gerhart, *The Plausibility of Life: Resolving Darwin's Dilemma* (2005) xiii.

non-semiotic life.[35] So Gerhart and Kirschner's notion of facilitated variation leading to increased complexity and ultimately to meaningful life is, *sub specie* thermodynamics, the notion of facilitated dissipation leading to accelerated entropy production.[36] Semiosis, especially as technological culture, increases burn rate, thus rate of entropy production, and such an increase is a thermodynamically favored transition.[37]

So Heidegger's words may inadvertently strike near the mark: "The still hidden truth of Being is withheld from metaphysical humanity. 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."[38]

One of Nietzsche's names for the enabling obscurity of disturbing truths (here the truth that semiotic organisms, like all others yet faster, "exist only by disordering the universe in which they exist"[39]) is *Dunstschicht des Unhistorischen*, the ahistorical mist, an instance of life's sleight of hand, *Kunststück des Lebens.* As death approached Heidegger was uttering *Nietzsche hat mich kaputt gemacht*. Nobody knows what he meant by that. To readers of Darwin, Nietzsche, and now Tomlinson it can mean that genealogy outperforms phenomenology.

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[35] Swenson said "order production is inexorable because order produces entropy faster than disorder;" in 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).

[36] John Gerhart and Marc Kirschner, "The theory of facilitated variation," 104 *Proc. Nat'l Acad. Sci. USA* 8582 (2007). Tomlinson observes that to maintain "the huge diversity, richness, and complexity of birdsong practices" requires "expensive wetware mechanisms and considerable energy devoted to learning, memorization, and production. Adaptationist and linguocentric approaches hardly begin to reveal what justifies the expense." *MESM* 180.

[37] The schematic 'transition-plausibility theorem' is here: "Reference to 'thermodynamic forces' is always metaphorical, a shorthand way of talking about potential energy gradients. A concentration gradient, for example, is nothing like a mechanical force. However, it does provide a boundary condition for systemic response. 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)—hence, the 'Order out of Chaos' title of the Prigogine-Stengers book." Jeffrey S. Wicken, "Entropy and Evolution: Ground Rules for Discourse," 35 *Systematic Zoology* 22; 26-27 (1986).

[38] Martin Heidegger, "Overcoming Metaphysics" in *The End of Philosophy* (tr. Joan Stambaugh 1973) 87. GA 7: 71: *Dem Menschentum der Metaphysik ist die noch verborgene Wahrheit des Seins verweigert. Das arbeitende Tier ist dem Taumel seiner Gemächte überlassen, damit es sich selbst zerreiße und in das nichtige Nichts vernichte.* https://www.beyng.com/gaselis/?vol=7.00&pg=71 .

[39] J. Scott Turner, *The Extended Organism: The Physiology of Animal-Built Structures* (2000) 12.