

Finitude's End (notes on *The Beginning of Infinity*¹)

For any civilization confined to a single planet, the prospects of long-term survival are rather bleak.²

Lloyd:—You mean 'not good' like one out of a hundred?

Mary:—I'd say more like one out of a million.

Lloyd:—[four long beats] So you're telling me there's a chance. *Yeah!*³

David Deutsch distinguishes human being from the rest of the biota in these words: “[W]hile every other organism is a factory for converting resources of a fixed type into more such organisms, human bodies (including their brains) are factories for transforming *anything into anything* that the laws of nature allow. They are ‘universal constructors.’”⁴ He explains that “The only uniquely significant thing about humans (whether in the cosmic scheme of things or according to any rational human criterion) is our ability to create new explanations, and we have that in common with all people.”⁵ ‘Humans’ are a subset of ‘people/persons’ which he defines as “entities that can create explanatory knowledge.”⁶ “[O]f all the different forms of universality, the most significant physically is the characteristic universality of people, namely that they are universal explainers, which makes them universal constructors as well.”⁷ “[T]here can be only one type of person: universal explainers and constructors.”⁸

Heidegger’s version of the distinction holds that human being is the only (in our experience to date) universal sense-maker. In Sheehan’s exposition,

“Ex-sistence as appropriated to sustaining the clearing is the basic occurrence of openedness: *das Grundgeschehniss der Wahrheit*. We are structurally dis-closed (*erschlossen*) and thus sustain the space within which the ‘as’ can function and the discursive understanding of things can take place. As such, we are pan-hermeneutical. Our lived environment is not just a natural encircling ring of instinctual drives that befits an animal, but an open-ended as-structured world of possible meanings that we can talk about, argue over, and vote on. Whatever we meet, we meet under the rubric of ‘is

¹ David Deutsch, *The Beginning of Infinity: Explanations That Transform the World* (2011).

² Delia Perlov and Alex Vilenkin, *Cosmology for the Curious* (2017) 322.

³  Dumb & Dumber - "So you're telling me there's a chance" .

⁴ *The Beginning of Infinity* 59, his italics.

⁵ *Ibid.*

⁶ *Id.* 56. “I prefer to talk about all those kinds of things, kinds of entities [that create explanatory knowledge] as people. Humans are people, extraterrestrials are people, AGIs will be people.”

 Mindscape 253 | David Deutsch on Science, Complexity, and Explanation at 24:49.

⁷ *The Beginning of Infinity* 146.

⁸ *Id.* 203.

manifest as'—that is, 'is accessible as' and therefore 'is meaningful as.' Our existential thrown-openness entails that we can and must make sense of whatever we meet. We are *ur-ἐρμηνεία*.”⁹

Again in Sheehan's interpretation:

“Structurally and in principle we are *able* to know everything about everything, even though we never will. Such ever-unrealized omniscience comes with our very ex-sistence. (Husserl: “God is the ‘*infinitely distant man*.’”) This open-ended possibility is a ‘bad infinity’ [Hegel’s term], which in this context denotes the asymptosis of endless progress in knowledge and control. Heidegger’s philosophical critique of (as contrasted with his personal opinions about) the modern age of science and technology cannot, on principle, be leveled against our ability to endlessly understand the meanings of things and even to bring them under our control, because this possibility is given *with* human nature, as Aristotle intimated and as Heidegger accepts in principle. . . . The mystery of human being consists in both the endless comprehensibility of whatever we can meet and the incomprehensibility of why everything is comprehensible. Everything is knowable—except the reason why everything is knowable.”¹⁰

In Deutsch’s account infinitely distant people will embody an ever more accurate working model of the universe. Consider a jet of stuff from a quasar:—“What would it be like in one of those jets?”

“[H]uman brains today know in considerable detail what is happening there. . . . That means that one physical system – say, an astrophysicist’s brain – contains an accurate working model of the other, the jet. Not just a superficial image (though it contains that as well), but an explanatory theory that embodies the same mathematical relationships and causal structure. That is scientific knowledge. Furthermore, the faithfulness with which one structure resembles the other is steadily increasing. Here we have physical objects very unlike each other, and whose behaviour is dominated by different laws of physics, embodying the same mathematical and causal structures – and doing so ever more accurately over time. Of all the physical processes that can occur in nature, only the creation of knowledge exhibits that underlying unity.”¹¹

By embodying the mathematical and causal structures of—explanatory knowledge about—more and more and more phenomena at all scales, the brains (or functional equivalent) of infinitely distant people will contain an asymptotically accurate working model of the universe itself. Not even the accelerating Hubble-flow will bar further progress; Deutsch contemplates future explainer-constructors homesteading the intergalactic void:—“it can only be a matter of knowing how.”¹²

⁹ Thomas Sheehan, *Making Sense of Heidegger: A Paradigm Shift* (2015) 104.

¹⁰ *Id.* 193.

¹¹ *The Beginning of Infinity* 72.

¹² *Id.* 67.

How to know how? How do we come by explanatory knowledge?

“Discovering a new explanation is inherently an act of creativity.” “[Explanatory] ideas do not create themselves, nor can they be mechanically derived from anything: they have to be guessed – after which they can be criticized and tested.” “*conjecture* is the real source of all our theories;” “all our theories originate locally, as guesswork in our own minds.” “Conjectures are the products of creative imagination.” “The knowledge in human brains and the knowledge in biological adaptations are both created by *evolution* in the broad sense: the variation of existing information, alternating with selection. In the case of human knowledge, the variation is by conjecture, and the selection is by criticism and experiment.”¹³

Descent with modification by variants has produced an organism “capable of wondering why it exists.”¹⁴ The subject of his book, Deutsch tells us, “is the infinite potential of explanatory knowledge.”¹⁵ People are the bearers of this infinite potential, and in virtue of that fact possess the greatest cosmic significance:

“[H]umans, people, and knowledge are not only objectively significant: they are by far the most significant phenomena in nature.” “From the least parochial perspectives available to us, *people* are the most significant entities in the cosmic scheme of things. They are not ‘supported’ by their environments, but support themselves by creating knowledge. Once they have suitable knowledge (essentially, the knowledge of the Enlightenment), they are capable of sparking unlimited further progress.”¹⁶

This beginning of open-ended creation of explanations is the principal ‘beginning of infinity.’¹⁷ Deutsch evidently sides with “all those who have thought that somehow or other we shall be at least reassured that at some level of the world’s constitution there is something that makes ultimate sense of our concerns.”¹⁸ The world—the universe—is constituted in such a way that in the limit at infinity it wholly reproduces itself—its mathematical and causal structures—in people. People are the most significant entities in the cosmic scheme of things because they are cosmiculi, the universe’s offspring growing ever closer to its image. This cosmic significance, the reader gathers, answers the question of why we exist, *Wozu Daseins*? At some level of the

¹³ *The Beginning of Infinity* 7, 8, 9, 10, 26, 78. Conjecture resembles *Entscheidung* in the characteristic that “each decision grounds itself upon something unmastered, concealed, bringing-to-err, otherwise it would not be a decision.” *Jede Entscheidung aber gründet sich auf ein Nichtbewältigtes, Verborgenes, Beirrendes, sonst wäre sie nie Entscheidung.* Martin Heidegger, *The Origin of the Work of Art* (tr. Roger Berkowitz and Philippe Nonet 2006) 38. <https://www.beyng.com/gaselis/?vol=5.00&pg=42>.

¹⁴ *The Beginning of Infinity* 144.

¹⁵ *Id.* 458.

¹⁶ *Id.* 74, 76.

¹⁷ *Ibid.*

¹⁸ Bernard Williams, *Shame and Necessity* (1993) 164.

world's constitution there is something that makes ultimate sense of our concerns in that we embody the beginning of the ultimate sense the world is in process of making.¹⁹ Anyway that's the gist.

Deutsch's stone-tablet maxims proclaim 'Problems Are Inevitable' and 'Problems Are Soluble.'²⁰ "Illness and old age," he assures us, "are going to be cured soon – certainly within the next few lifetimes – and technology will also be able to prevent deaths through homicide or accident by creating backups of the states of brains [etc.]. So there can be only one outcome: effective immortality for the whole human population, with the present generation being one of the last that will have short lives."²¹

To accept that we are finite is, for Deutsch, failure; failure in, quoting Popper, "our duty to remain optimists."²² Heidegger's conception of the human condition therefore fails because it mischaracterizes us as being-toward-death, rather than being-toward-infinity. In Sheehan's words once more:

"We are enveloped both by riotous becoming and by death-dealing entropy, and nowhere is this more evident than in our own lives, which ever shoulder up against mortality: *nascendo et moriendo*. Our urge to survive resists death and the chaos of things going their own way apart from us—and yet our mortality is our very bondedness to the chaos that will finally swallow us. We struggle for a secure space where we can, at least for a while, hold things together. We are born as λόγος, the need and ability to gather disparate things into a tentative unity of sense and thereby secure a shared human world (perhaps overseen and guaranteed by the gods) that we can inhabit for these few years. Our inescapable need of meaning is both the passing remedy for and the surest sign of our mortality. We cannot have one without the other. Ours is a fight to the death *against* death in the name of a fragile and ultimately futile stability. And out of this struggle come the glory of creativity and the grandeur of accomplishment, the openness of things in all their bright innocence and dark terror, as well as the tragedy of ultimate defeat. Meaning staves off chaos for a brief stretch of time in the losing battle of life."²³

¹⁹ At least we are candidates for that ultimate embodiment. "We know that *people* are of fundamental significance, but we do not know whether we are among those people: we may fail, or give up, and intelligences originating elsewhere in the universe may be the beginning of infinity." *The Beginning of Infinity* 458.

²⁰ *Id.* 64-65.

²¹ *Id.* 455.

²² *The Beginning of Infinity* 196.

²³ *Making Sense of Heidegger* 114-115.

(‘Let us beware of saying chaos is the opposite of meaning; meaning is only a phase of chaos, and a very transient one.’²⁴)

Yet Heidegger and Deutsch both discourse fundamentally in terms of analogous thematic pairs.²⁵ *Höher als die Wirklichkeit steht die Möglichkeit*, says Heidegger.²⁶ Sheehan comments:

“Making sense of things requires the imperfection and incompleteness of possibility, along with the resultant space for mediation. Heidegger sets this particular notion of the human finitude over against the traditional one, which measures finitude against the infinity of the divine.” “Meaningful presence is never pure presence and actuality, but always open-ended, suffused with further possibilities. Our knowing is not perfect light but chiaroscuro, not the divine’s eternal rest but an ever ongoing movement of disclosure coupled with an inevitable failure-to-disclose.”²⁷

Heidegger’s saying transposed into *Deutschsprache* is ‘Higher than the parochial stands the universal.’ Parochialism, in Deutsch’s schema, is “Mistaking appearance for reality, or local regularities for universal laws.”²⁸ “All people in the universe, once they have understood enough to free themselves from parochial obstacles, face essentially the same opportunities [sc. for developing toward universality].”²⁹

Deutsch observes that progress toward universality proceeds by jump.³⁰ Heidegger’s discontinuities are ‘openings’ and ‘breaks.’ E.g., human existence is a kind of breach:

“With the existence of human beings there occurs an irruption [*Einbruch*] into the totality of beings [*in das Ganze des Seienden*], so that now the being [entity] in itself first [*jetzt erst*] becomes manifest, i.e., as being [*das Seiende an ihm selbst, d.h. als Seiendes offenbar wird*], in varying degrees, according to various levels of clarity, in various degrees of certainty.”³¹

Progress toward universality jumps from the parochiality of this variously manifest multitude of beings to just three “minimal physical features”—energy, matter, and evidence. “[B]ecause

²⁴ In Heideggerese, ‘Let us beware of saying *das Nichts* is the opposite of *Sein*, etc.’ After Nietzsche: *Hüten wir uns, zu sagen, dass Tod dem Leben entgegengesetzt sei. Das Lebende ist nur eine Art des Todten, und eine sehr seltene Art.* <http://www.nietzschesource.org/#eKGWB/FW-109>.

²⁵ See Gerald Holton, “On the Role of Themata in Scientific Thought,” 188 *Science* 328 (1975); and Holton, *Thematic Origins of Scientific Thought: Kepler to Einstein* (rev. ed. 1988).

²⁶ <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.038.html>.

²⁷ *Making Sense of Heidegger* 241, 101.

²⁸ *The Beginning of Infinity* 76.

²⁹ *Id.* 69.

³⁰ *Id.* ch. 6.

³¹ *Kant and the Problem of Metaphysics* (tr. Richard Taft, 5th ed., enlarged 1997) 160. GA 3:228: <https://www.beyng.com/pages/de/GA03/GA03.228.html>.

humans are universal constructors, *every* problem of finding or transforming resources can be no more than a transient factor limiting the creation of knowledge in a given environment. And therefore matter, energy and evidence are the only requirements that an environment needs to have in order to be a venue for open-ended knowledge creation.”³²

The approach to universality requires liberation from the parochialism of self-deception. Deutsch quotes Richard Feynman as saying “Science is what we have learned about how to keep from fooling ourselves;” and again, “as Feynman said, we keep learning more about how not to fool ourselves.”³³ We recall ‘Feynman’s prime directive’: “The first principle is that you must not fool yourself—and you are the easiest person to fool. So you have to be very careful about that.”³⁴

And yet Deutsch also says “in nature there is no conjurer trying to deceive us intentionally.”³⁵ That is the heart of the faith of Enlightenment and scientific optimism. Lacan emphasizes the centrality of that faith in this passage:

“Take Aristotle. Everything he says is perfectly communicable, and nevertheless the position of the nondeceptive element is essentially different for him and for us. Where is this element for us? Well, whatever minds satisfied with appearances – which is often the case with free-thinkers, and even the most positivist among you, indeed the most liberated from any religious idea – might think, the simple fact that you live at this precise moment in the evolution of human thought does not exonerate you from what was openly and rigorously formulated in Descartes’s meditation about God as incapable of deceiving us. This is so true that so lucid a personality as Einstein, when it was a matter of handling that symbolic order that was his, recalled it – *God*, he said, *is clever, but he is honest*. The notion that the real, as difficult as it may be to penetrate, is unable to play tricks on us and will not take us in on purpose, is, though no one really dwells on this, essential to the constitution of the world of science. Having said this, I admit that the reference to a nondeceiving god, the one accepted principle, is based on results obtained by science. We have in fact never observed anything that would show us a deceiving demon at the heart of nature.”³⁶

Yet insofar as “the most significant phenomena in nature” are at the heart of nature, Lacan’s concluding assertion, like Deutsch’s quoted above, is false.

³² *The Beginning of Infinity* 61, 62.

³³ *Id.* 22 and 39. DER FORSCHER: Worauf sollen wir denn warten? Und wo sollen wir warten? Ich weiß bald nicht mehr, wo ich bin und wer ich bin. DER WEISE: Das wissen wir alle nicht mehr, sobald wir davon ablassen, uns etwas vorzumachen. <https://www.beyng.com/gaselis/?vol=77.00&pg=110>.

³⁴ *Cargo Cult Science*. *betrüge niemanden, nicht einmal dich selbst*. <http://www.nietzschesource.org/#eKGWB/SE-2>

³⁵ *The Beginning of Infinity* 14. «*Dieu n’est pas trompeur*». . . . Or ça, précisément, nous n’en savons rien! Jacques Lacan, *Le moi* 1954-1955; <http://staferla.free.fr/S2/S2%20LE%20MOI.pdf> 211 (Leçon 18, 11 mai 1955).

³⁶ *The Seminar of Jacques Lacan Book III, The Psychoses 1955-1956* (ed. Jacques-Alain Miller tr. Russell Grigg 1993) 64-65.

“The most significant entities in the cosmic scheme of things” are inveterate self-deceivers, else there would be no need to purge self-deception from their being in order to progress further toward universality and infinitude. (The purity/danger thematic pair at work here.³⁷)

So might we not be kidding ourselves about our function in nature, that sense-making is for the sake of progress toward universal intelligibility and infinitude?

How to make sense of that possibility? Maybe if we shift our point of view a little.³⁸ E.g., “[T]he second law of thermodynamics says that everything is getting worse: not a striving toward perfection, but an unwinding into collapse.”³⁹ Factories for transforming anything into anything that the laws of nature allow are not allowed perfect efficiency in their processes; they all produce entropy. Deutsch obliquely acknowledges the universality of the Second Law with the phrase “inevitable inefficiencies.”⁴⁰ Degradation, in every process, of at least some quantity of useful free energy into useless entropy is, by current lights, a fact of nature. Universal constructors are by ‘entropic complementarity’ also universal destroyers; “every unit of energy used eventually becomes waste heat.”⁴¹ This fact of necessary wastage as a ‘problem,’ an ‘evil,’ is only in the short run mitigable by some increment of efficiency, but not eliminable. “The ‘Kelvin Limit’ defines the point where this added waste heat pushes Earth’s surface temperature to 373 K (100 °C), the boiling point of water. . . . This thermal wall represents a hard physical limit. Technological efficiency cannot bypass it; higher energy use to drive AI or industry accelerates the transition toward this planetary boiling point.”⁴² (Well okay, but we could just relocate to Mars; “it can only be a matter of knowing how,” right?)

“Great works of nature and humanity,” writes the great predation theorist Geerat Vermeij,⁴³ “all have something in common: they exemplify power.”⁴⁴ He means power as energy per unit time, watts. Living organisms are heat engines: “The fundamental phenotype of life is metabolism. . . . Energy is captured and put to work before it leaves the body in degraded, unusable form as

³⁷ Mary Douglas, *Purity and Danger: An analysis of the concepts of pollution and taboo* (1966).

³⁸ Deutsch quotes Sherlock Holmes’s remark in ‘The Boscombe Valley Mystery’ that “circumstantial evidence is a very tricky thing . . . It may seem to point very straight to one thing, but if you shift your own point of view a little, you may find it pointing in an equally uncompromising manner to something entirely different . . . There is nothing more deceptive than an obvious fact.” *The Beginning of Infinity* 10.

³⁹ “[Birnbaum’s] got this view that the world is striving towards perfection, or something. But the second law of thermodynamics says, etc.” P. W. Atkins as quoted in Oliver Burkeman, [Has David Birnbaum solved the mystery of existence? | Philosophy books | The Guardian](#) .

⁴⁰ *The Beginning of Infinity* 63.

⁴¹ Robert T. Nachtrieb and Steven J. Smith, “AI Hastens Limits to Exponential Growth” (24 April 2026); <https://arxiv.org/pdf/2604.23026> 4.

⁴² *Id.* 4, 5.

⁴³ *Evolution and Escalation: An Ecological History of Life* (1987).

⁴⁴ Geerat J. Vermeij, *Nature: An Economic History* (2004) 122.

heat.”⁴⁵ Technology is a system of artificial organs for exo-somatic metabolism.⁴⁶ The success of metabolism “is measured simply by persistence or continuity, whereas dominance refers to the direct or indirect control over others.”⁴⁷ Cosmic significance as universal constructor entails direct or indirect control over others:—any other, any thing. Technology fashioned from explanatory knowledge boosts metabolic power and thereby dominance; power amplifies cosmic significance. Whereas efficiency, to paraphrase Vermeij, is for mere persistors.⁴⁸

“Nature abhors a gradient”⁴⁹ but nature is itself **the** Great Big Gradient—a difference across spacetime—between the super-low-entropy of yesteryear and the super-high-entropy τοῦ μέλλοντος αἰῶνος, *futuri saeculi*. Nature is the process destroying that gradient. And life in its meager way accelerates the process: “It appears that living communities serve to augment the rate of entropy production over what it would be in the absence of biota.”⁵⁰ ‘Serve’ is right, life is ancillary to entropy production by gradient destruction. At this level of the world’s constitution something does indeed make ultimate sense of our concerns, our Dasein, *d.h., Seiendes, dem es in seinem Sein um dieses selbst geht*.⁵¹ Our cosmic significance, finitude’s end, *unser Wozu*, is as local accelerators of the universal process of entropy production. “[O]n a volumetric basis, humans entropicize their environment at a rate $1.80 \cdot 10^{23}$ times greater than the ‘background’ entropy generation rate of the universe.”⁵² As “meaning staves off chaos” it accelerates the **production** of chaos and dumps it in the nearest sink.

This shifted point of view may be sloganized in ‘The Second Law is smarter than we are.’⁵³ (Or, remembering Foucault, ‘Knowledge is not made for lighting, it’s made for heating.’⁵⁴) As in Nietzsche’s view that it is hard to overstate *wie kläglich, wie schattenhaft und flüchtig, wie zwecklos und beliebig sich der menschliche Intellekt innerhalb der Natur ausnimmt*.⁵⁵

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⁴⁵ *Id.* 15.

⁴⁶ See generally J. Scott Turner, *The Extended Organism: The Physiology of Animal-Built Structures* (2000).

⁴⁷ *Nature: An Economic History* 35.

⁴⁸ See <https://vaclavsmil.com/wp-content/uploads/2021/03/smil-energyconversion2021-1.pdf>.

⁴⁹ Eric D. Schneider and Dorion Sagan, *Into the Cool: Energy Flow, Thermodynamics, and Life* (2006) 72.

⁵⁰ R. E. Ulanowicz and B. M. Hannon, “Life and the production of entropy,” 232 *Phil. Trans. R. Soc. B* 181 (1987).

⁵¹ Martin Heidegger, *Sein und Zeit* 191.

⁵² B. E. Layton, “Anthropogenic entropy acceleration and its relation to Shannon information in the context of socioeconomics,” 186 *WIT Transactions on Ecology and The Environment* 313, 314-315 (2014): <https://par.nsf.gov/servlets/purl/10039440>.

⁵³ After Leslie Orgel, “Evolution is cleverer than you are.” https://en.wikipedia.org/wiki/Orgel%27s_rules.

⁵⁴ *C’est que le savoir n’est pas fait pour comprendre, il est fait pour trancher.*

⁵⁵ <http://www.nietzschesource.org/#eKGWB/WL-1>.