

Peak complexity

and with the right kind of eyes you can almost see the high-water mark—that place where the wave finally broke and rolled back.¹

Sean Carroll favors a broad Church to accommodate the variety of complexity, for “there is no one definition that works for every circumstance—different systems can exhibit complexity in different ways. That’s a feature, not a bug; complexity comes in many forms. We can ask about the complexity of a given algorithm designed to solve a problem, or the complexity of a machine that responds to feedback, or the complexity of a static image or design.”² (Or about the complexity of the system that asks about complexity—‘Who are we?’) In Carroll’s account the trajectory of the universe’s entropic arrow of time is ever rising, whereas the trajectory of the arrow of complexity is parabolic, rise-peak-fall: “The era of complex behavior that our universe is currently enjoying is, alas, a temporary one.”³ Entropy, as aforesaid, increases; if not forever at least past the point the universe is capable of sustaining anything complex enough to sense the arrow of time.⁴

Stephen Jay Gould uses the concept of frequency distribution to depict the anabasis of complexity in the history of life on Earth. He presents it as “an *increase in total variation by expansion away from a lower limit, or ‘left wall,’* of simplest conceivable form . . . into the only open space . . . toward the direction of greater complexity.”⁵ He goes on to note that human cultural change “operates by mechanisms that can validate a general and driven trend to technological progress—so very different from the minor and passive trend that Darwinian processes permit in the realm of natural evolution. And once you start to operate by general and driven trends, you can move very deliberately, and very fast. With directed motion of this

¹ Hunter S. Thompson, *Fear and Loathing in Las Vegas: A Savage Journey to the Heart of the American Dream* (1971) ch. 8, last line.

² Sean Carroll, *The Big Picture: On the Origins of Life, Meaning, and the Universe Itself* (2016) 230.

³ *Id.* 230. “I suspect that there’s some mathematical result that says that complexity must be low at low entropy because there’s just not a lot of different things the system can do, and complexity must be low at high entropy because everything is in equilibrium and pretty smooth, and complexity is allowed to be high at medium entropy, but whether or not it actually achieves that large complexity along the way from low entropy to high entropy depends on the details, and that’s what we would like to better understand.” At 1:15:07 here: <https://www.preposterousuniverse.com/podcast/2025/06/30/320-solo-complexity-and-the-universe/>.

⁴ The universe is thought to be about 1.4×10^{10} years old. Estimates of the future lifetime of the terrestrial biosphere are tabulated here: <https://iopscience.iop.org/article/10.3847/PSJ/ad7856>. Most optimistic is $\approx 2 \times 10^9$ years; i.e., surface life’s entire expected future is still within the order 10^{10} (terrestrial extinction by $\approx 1.6 \times 10^{10}$ from the Big Bang). Terrestrial life won’t make it to 10^{11} . Whereas maximum entropy of the universe will only be reached, per Carroll, at about the 10^{100} mark; that’s forever enough for present purposes.

⁵ Stephen Jay Gould, *Full House: The Spread of Excellence from Plato to Darwin* (1996) 147, 158, 171 (his italics).

sort, you ought to start running into right walls.”⁶ I.e., colliding with limits to further complexification.⁷

The arrow of complexity shows up at different points in *Being and Time*. For instance, Heidegger comments in §11 that “so-called ‘primitive’ peoples have their own kinds of everydayness [*seine spezifische Alltäglichkeit*] along with ways of ex-sisting that are not of the everyday kind. Focusing a hermeneutic of ex-sistence on the lives of such peoples would be methodologically fruitful for studying ex-sistence insofar as their experiences are often not obscured by complicated [*kompliziert*] self-interpretations and are expressed more directly in terms of their lived, pre-theoretical absorption in things.”⁸

Again in §17 Heidegger claims that “In cultures imbued with magic and fetishism, people are more immediately [»*unmittelbaren*«] involved in their worlds of meaning and usually take things as signs without engaging in elaborate theories about it [*nicht in theoretischer Absicht und nicht auf dem Wege theoretischer Spekulation*].” In such worlds “the sign has not yet become ‘free,’ that is, differentiated and detached from what it indicates [*ein Noch-nicht-freiwerden des Zeichens vom Bezeichneten*]. It is still tightly bound up with what it is about, what it is a sign of.”⁹

Sheehan’s paraphrase highlights the thema of ‘not yet’ in this passage. The formal definition of a world of practical activity “must be broad enough and flexible enough so that when we say something in a given world of meaning is ‘not yet X’ (e.g., that ‘primitive’ cultures do not yet understand signs as signs), such statements will not be understood negatively but rather as offering a positive insight into what we are discussing.”¹⁰ And for present purposes, a glimpse of the arrow of complexity.

⁶ *Id.* 223.

⁷ For society-scale examples see Joseph Tainter, *The Collapse of Complex Societies* (1988) and the Scroll of Doom at <https://www.reddit.com/r/collapse/>.

⁸ Thomas Sheehan, *Heidegger’s Being and Time Paraphrased and Annotated Vol. 1* (2025) 71 (BTPA); *Sein und Zeit* 51: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.051.html>.

⁹ BTPA 105-106; SZ 81-82: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.081.html>.

¹⁰ *Ibid.* Ex-sistence as ever-not-yet is the principal theme of Sheehan’s interpretation of Heidegger, which, as MH himself instructed Sheehan it should, sounds in Aristotle. “Aristotle understands movement as always for the sake of a goal; whatever is in movement strives for full appearance and stable constancy. His genius was to see the ‘not-yet’ dimension of something in motion as ‘im-perfect’ (*ad perfectionem*) in the sense of being on the way to perfection or fulfillment.” Thomas Sheehan, *Making Sense of Heidegger: A Paradigm Shift* (2015) 45. “Ex-sistence is unique in being already ‘complete’ in its incompleteness, already ‘whole’ as never being whole. Ex-sistence is perfectly ‘perfect’ in its imperfection, its inability to achieve complete self-coincidence.” Thomas Sheehan, ‘How Heidegger came up with the word “Ereignis”’: <https://www.beyng.com/docs/TomSheehanEreignis.html>.

In similar vein Heidegger will say a couple of years later that, although we sometimes speak of higher and lower animals, “it is nevertheless a fundamental mistake [*ein Grundirrtum*] to suppose that amoebae or infusoria are more imperfect or incomplete [*unvollkommenere*] animals than elephants or apes. Every animal and every species of animal as such is just as perfect and complete [*vollkommen*] as any other. Thus it should be clear from everything we have said that from the outset this talk of poverty in world and world-formation must not be taken as a hierarchical evaluation [*einer abschätzigen Stufenordnung*].”¹¹ So also, we should add, *jedes Dasein und jede Daseinart* is, *qua* ex-sistence, just as *vollkommen* as another (under the aspect of perfectly-imperfect kinesis—see footnote 10.) Nevertheless, from worldless to poor-in-world to world-forming is a trajectory with positive first derivative, from simplicity to *komplizierten Lebensform*, in Wittgenstein’s phrase.

Heidegger characterizes the stage of complexity of animals as *Benommenheit*: *Positiv können wir sagen: Der Organismus ist das Fähigsein zum Benehmen in der Einheit der Benommenheit. . . . Die Benommenheit ist das Grundwesen des Organismus.*¹² “The animal’s way of being, which we call ‘life’, is not without access [*ist nicht zugangslos*] to what is around it and about it, to that amongst which it appears as a living being. It is because of this that the claim arises that the animal has an environmental world of its own within which it moves. Throughout the course of its life the animal is confined [*eingesperrt*] to its environmental world, immured as it were within a fixed sphere [*in einem Rohr*] that is incapable of further expansion or contraction [*das sich nicht erweitert und verengt*].”¹³

Life began at the ‘left wall’ of simplicity, Gould writes, “with a bacterial mode. Life still maintains a bacterial mode in the same position.” Gould’s use of ‘mode’ here nicely ambiguates between the meaning ‘modality, *Weise*,’ and the word’s meaning in statistics, ‘most frequent data-value in the distribution.’ Gould goes on, “So it was in the beginning, is now, and ever shall be—at least until the sun explodes and dooms the planet.” Again: “On any possible, reasonable, or fair criterion, bacteria are—and always have been—the dominant forms of life on earth.”¹⁴

¹¹ *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude* (tr. William McNeill and Nicholas Walker 1995) (FCM) 194:
<https://www.beyng.com/pages/en/FundamentalConceptsMetaphysics/FundamentalConceptsMetaphysics.194.html> . *Gesamtausgabe Band 29/30*: 287: <https://www.beyng.com/gaselis/?vol=29.30&pg=287> . Cf.: *Platons Denken ist nicht vollkommener als das des Parmenides. Hegels Philosophie ist nicht vollkommener als diejenige Kants. Jede Epoche der Philosophie hat ihre eigene Notwendigkeit.* GA 14: 70 :
<https://www.beyng.com/gaselis/?vol=14.00&pg=70> .

¹² FCM 375, 376. GA 29/30: 375: <https://www.beyng.com/gaselis/?vol=29.30&pg=375> .

¹³ <https://www.beyng.com/gaselis/?vol=29.30&pg=292> .

¹⁴ *Full House* 170, 176.

Furthermore, we live, says Gould, “in a fractal world of ‘self-similarity,’ where local and limited cases have the same structure as examples at largest scale.”¹⁵ *Benommenheit*, then, is the ‘modal bacter’ of metazoa in that it is the predominating form of life’s openness, its *Offenheit für* ____ . *[Das Tier] kann sich eine bestimmte Umgebung nur einpassen, sofern zu seinem Wesen die Offenheit für ... ge-hört und sofern aufgrund der Offenheit für ... , die sich durchdas gesamte Benehmen hindurchzieht, ein Spielraum ge-schaffen ist, innerhalb dessen das Begegnende so und so be-gegnen kann, d. h. in der Funktion des Enthemmens auf das Tier zu wirken vermag.*¹⁶ Yet as Gould notes of the region ‘to the right of’ the modal bacter, “New species occasionally wander into this previously unoccupied domain.”¹⁷ So also, at the further stage reached by a unique case, into the unoccupied open domain ‘to the right of’ modal *Benommenheit*.

For, in comparison to that of, say, the bee, “the world of man is a rich one, greater in range [*größer an Umfang*], far more extensive in its penetrability [*weitergehend an Eindringlichkeit*], constantly extendable not only in its range (we can always bring more beings into consideration) but also in respect to the manner in which we can penetrate ever more deeply in this penetrability [*der Eindringlichkeit mehr und mehr zu durchdringen*].”¹⁸

The principal manner in which we accomplish deeper penetration is by further complication of our understanding **of things**, by ‘going theoretical’ through a *künstlichen und komplizierten Einstellung*; viz.: *»Zunächst« hören wir nie und nimmer Geräusche und Lautkomplexe, sondern den knarrenden Wagen, das Motorrad. Man hört die Kolonne auf dem Marsch, den Nordwind, den klopfenden Specht, das knisternde Feuer. Es bedarf schon einer sehr künstlichen und komplizierten Einstellung, um ein »reines Geräusch« zu »hören«.*¹⁹ In Welch’s gloss, “it is one thing to understand what arises for encounter while we are caught up in responding to it, and it is quite another matter to understand it while locating ourselves at a distance from it. Indeed, understanding-at-a-distance differs from understanding-on-site — not in kind but in mode. For understanding-at-a-distance is *derived* from understanding-on-site.”²⁰ Theoretical understanding derives from everyday understanding.

Its own modal bacter, the overwhelmingly most frequent and dominant ‘how’ of ex-sistence, is *Alltäglichkeit: Diese Indifferenz der Alltäglichkeit des Daseins ist nicht nichts, sondern ein positiver phänomenaler Charakter dieses Seienden. Aus dieser Seinsart heraus und in sie zurück*

¹⁵ *Id.* 149.

¹⁶ GA 29/30: 384-385: <https://www.beyng.com/gaselis/?vol=29.30&pg=384> .

¹⁷ *Full House* 171.

¹⁸ FCM 193:

<https://www.beyng.com/pages/en/FundamentalConceptsMetaphysics/FundamentalConceptsMetaphysics.193.html> . GA 29/30: 285: <https://www.beyng.com/gaselis/?vol=29.30&pg=285> .

¹⁹ SZ 163-164: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.163.html> .

²⁰ Cyril Welch, “Why Heidegger and Logic?”: https://libraryguides.mta.ca/ld.php?content_id=34985235 33.

*ist alles Existieren, wie es ist. . . . Alltäglichkeit ist eine Weise zu sein, der allerdings die öffentliche Offenbarkeit zugehört.*²¹

Alltäglichkeit and *Benommenheit* are similar structures at their respective scales of complexity, *Seinsmodi*; for *Benommenheit* is the *Alltäglichkeit* of animality, and *Alltäglichkeit* the *Benommenheit* of ex-sistence. Yet, ***Alltäglichkeit deckt sich nicht mit Primitivität.*** *Alltäglichkeit* is, again in Wittgenstein's phrase, a complicated form of life, more complex than *Benommenheit*. Heidegger insists that *Alltäglichkeit* is *ein Seinsmodus des Daseins auch dann und gerade dann, wenn sich das Dasein in einer hochentwickelten und differenzierten Kultur bewegt.*²²

In the frequency distribution of biological complexity *Alltäglichkeit* lies far out in the tail to the right of *Benommenheit*. Yet for Heidegger even this extreme outlier is a *Noch-nicht-freiwerden des Verhältnisses vom Alltäglichkeiten*. And a few *Daseins* occasionally, rarely, do wander, for a moment, into the previously unoccupied domain, *Seinsmodus*, to the right of *Alltäglichkeit* and its offspring *Theorie*. Heidegger names this remote, evanescent space *Entschlossenheit*, 'eclosion.'

Entschlossenheit is reported to be a state of explicit, over-and-em-powering awareness that human being makes sense in an otherwise senseless universe, that "ex-sistence is the only place that meaning shows up."²³ Once this 'moment of vision,' *Augenblick*, has passed, the seer returns to *Alltäglichkeit*, yet transformed by the vision and now freed to 'choose its hero.' Sheehan characterizes the transformation as "to 'double' one's ex-sistence: already structurally thrown open (*erschlossen*), I take it over and become *resolutely* thrown-open (*entschlossen*)."²⁴

²¹ SZ 43: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.043.html> ; SZ 371: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.371.html> .

²² SZ 50-51: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.050.html> .

²³ *Making Sense of Heidegger* 190. Vivid depiction: "In this instant of terror you, too, float away from the calm and self-assured self that you were only a second ago. In a flash of insight you realize that your world of meaning is based on nothing solid at all and has no final reason that can account for it. The thin wall that previously separated you from your groundless facticity collapses, and you have to face, for the first time, the absurdity of the burden you bear: the need to make sense of things, with no founding or final reason. In confronting the ultimate meaninglessness of sense-making, you realize that whereas you once could make sense of everything, you now cannot make sense of anything, much less of sense-making itself, and least of all of your own self. You encounter the absurd—not just this or that puzzle or problem or mystery to be solved, but the very real fact that making sense is ultimately an ungroundable, futile task into which you are thrown by the sheer fact of being human. As Heidegger puts it, for that brief instant you hang suspended over the abyss of the absurd." *Id.* 163.

²⁴ *Id.* 157.

Note that Heidegger's emplotment²⁵ of the experience retells the myth of deliverance.²⁶ Here I'm only concerned to remark that this stage of complexity briefly exceeds *Alltäglichkeit* (jumps from *er-* to *ent-*), and so far as I can see is the peak (first derivative zero) of human complexity.

Concluding his recent soliloquy on complexogenesis Carroll says, "So, I don't know about the universe as a whole, but I think that unless we do something dumb and kill ourselves, there's a lot of room for increased complexity and increased sophistication in our use of information here on Earth."²⁷ Carroll takes 'information' to be physical,²⁸ i.e., low Boltzmann-entropy/free energy. Note that to use information, with whatever level of sophistication, is concomitantly to produce entropy.²⁹

This contemplated increase of complexity and sophistication in our use of information I take to be the equivalent of Heidegger's *man braucht nur Seiendes hinzubringen*, 'we can always bring more beings into consideration.'³⁰ Such further resource-extraction and enhanced facility in manipulating beings/information would no doubt lead us into *einer hochentwickelten und differenzierten Kultur*.³¹ But—my point—will not increase the complexity of human being *qua* ex-sistence.

²⁵ "Emplotment is the way by which a sequence of events fashioned into a story is gradually revealed to be a story of a particular kind. . . . a given historian is forced to emplot the whole set of stories making up his narrative in one comprehensive or *archetypal* story form. . . . The important point is that every history, even the most 'synchronic' or 'structural' of them, will be emplotted in some way." Hayden White, *Metahistory: The Historical Imagination in Nineteenth-Century Europe* ([1973] 2014) 8.

²⁶ Which "seems to be at the core of every major myth of concern." Northrop Frye, *The Myth of Deliverance: Reflections on Shakespeare's Problem Comedies* (1983) 12.

²⁷ <https://www.preposterousuniverse.com/podcast/2025/06/30/320-solo-complexity-and-the-universe/> at 2:13:58.

²⁸ "Information is physical." Sean Carroll, *From Eternity to Here: The Quest for the Ultimate Theory of Time* (2010) 189.

²⁹ "Since the Industrial Revolution, we have been polluting the atmosphere with gases that are opaque to infrared light, making it harder for energy to escape and thereby heating the planet." *The Big Picture* 243. "If there is any one factor that has most characterized the evolution of culture, it is almost surely an increasing capacity to extract energy from Nature—but not merely to capture energy, rather to store it, to transfer it, in short to process energy. . . . 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 societal ills." Eric J. Chaisson, *Cosmic Evolution: The Rise of Complexity in Nature* (2001) 207. *Die Wüste wächst: weh Dem, der Wüsten birgt!* <http://www.nietzschesource.org/#eKGWB/Za-IV-Toechter-2> .

³⁰ Cf. the fundamental theorem of internet ontology: 'If it exists, there is porn of it.'

³¹ "The end of philosophy proves to be the triumph of the manipulable arrangement of a scientific-technological world and of the social order proper to this world. The end of philosophy means the beginning of the world civilization based upon Western European thinking." "The end of philosophy and the task of thinking," tr. Joan Stambaugh in *Martin Heidegger: Basic Writings from Being and Time (1927) to The Task of Thinking (1964)* (ed. David Farrell Krell 1977) 377. GA 14: 73: <https://www.beyng.com/gaselis/?vol=14.00&pg=73> .

Ex-sistence has hit the right wall of life's complexity as openness, *Offenheit*. Call it the *keine neue Nähe* phenomenon. For, Heidegger says, *Dasein ist »in der Wahrheit«*.³² Sheehan's annotations help us see that *Wahrheit* here is, in Sheehan's term, *alētheia-1*, that is "the a priori dis-closure (opening up) of the discursive field of intelligibility."³³ "Metaphorically speaking," Sheehan comments elsewhere, "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.)"³⁴ Sticking with metaphor, life is a physical field, *das Offenfeld*, and our local patch, ex-sistence, instances the highest value the field takes. "*Being and Time* as published shows that our ability to understand the meanings of natural, sensible things is unrestricted. . . . Structurally and in principle we are *able* to know everything about everything, even though we never will."³⁵ You cannot get more open to beings than that.

We can get better answers to our questions and these better answers will generate more questions. It's simply that, like the animal's environmental *Rohr*, ἀλήθεια *sich nicht erweitert*. Our knowledge of beings grows, our openness to beings does not. We are as opened-up (*erschlossen*)—'in the truth'—as we'll ever be.

Entschlossenheit, just as Welch says of *Theorie*, differs from *Alltäglichkeit* not in kind but in mode; all three are phenomena of ἀλήθεια. Sheehan (note 24 above) speaks of *Entschlossenheit's* occurring in a flash of insight, and insight is an *alltäglich* phenomenon—"insights are a dime a dozen," as Lonergan puts it.³⁶ *Entschlossenheit* 'doubles' ex-sistence in that *Entschlossenheit* is—to borrow again from Lonergan—"insight into insight,"³⁷ an intimation of ἡ τῆς ἀληθείας ἀλήθεια.

Responsive to the inveterate implicit inquiry 'Who are we?', this second-order insight discloses that, in Sheehan's words, "The clearing [what we're calling our region of *das Offenfeld*] is the οὐ ἔνεκα of ex-sistence, its very *raison d'être*, that for the sake of which ex-sistence ex-sists at all."³⁸

³² SZ 221: <https://www.beyng.com/pages/de/SeinUndZeit/SeinUndZeit.221.html> . Heidegger will say in 1964 that "to raise the question of *alētheia*, of unconcealment [*Unverborgenheit*] as such, is not the same as raising the question of truth [*Wahrheit*]. For this reason, it was inadequate and misleading [in *Being and Time*] to call *alētheia*, in the sense of opening [*Lichtung*], truth." "The end of philosophy and the task of thinking" 389. GA 14: 86 : <https://www.beyng.com/gaselis/?vol=14.00&pg=86> .

³³ BTPA 526.

³⁴ *Making Sense of Heidegger* xv.

³⁵ *Id.* 192, 193. Beware that sorrow, according to one authority, is a monotonically increasing function of knowledge. *Ecclesiastes* 1:18.

³⁶ Bernard J. F. Lonergan, *Method in Theology* (1971) 13.

³⁷ Bernard Lonergan, *Insight: A Study of Human Understanding* ([1957] 1992) 3-4, 22.

³⁸ *Making Sense of Heidegger* 194.

To put it in information-theoretic terms, ex-sistence is the one and (so far as is presently known) only general-purpose information processor (G-PIP). Moreover this processor is an **obligate** omnivore. In Sheehan's mantra, ex-sistence cannot **not** make sense of everything it encounters.

All of which brings us back once more to 'Darwin's curse,' viz.:

"Natural selection will never produce in a being anything injurious to itself, for natural selection acts solely by and for the good of each. No organ will be formed, as Paley has remarked, for the purpose of causing pain or for doing an injury to its possessor. If a fair balance be struck between the good and evil caused by each part, each will be found on the whole advantageous. After the lapse of time, under changing conditions of life, if any part comes to be injurious, it will be modified; or if it be not so, the being will become extinct, as myriads have become extinct."³⁹

Peripeteia in nature. Carroll again: "If that's something [i.e., increased complexity and increased sophistication in our use of information] that we value, then that's maybe a goal that we can have to keep that going, to keep that surviving and not do dumb things and destroy ourselves here on Earth."⁴⁰ The question then arises whether G-PIP's increasingly complex and sophisticated processing of beings might of **itself** so change the conditions which have hitherto sustained it that its further output will eventuate in unintended self-extinction (not to mention extinction of myriad other species).

Rise-peak-fall is the trajectory of tragedy. Aristotle remarked of the tragic *mythos* that 'the most exquisite *anagnōrisis* co-occurs with *peripeteia*,' καλλίστη δὲ ἀναγνώρισις ὅταν ἅμα περιπετεία γένηται.⁴¹ The moment of vision at the very inflection point, at the precipice of catastrophe, makes the finest play. If we do emplot the track of human complexity, 'Being's poem,' as tragedy, then what is the part become injurious, the *hamartia*, the fatal *Irre*?

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³⁹ *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life* (1859) 201.

⁴⁰ <https://www.preposterousuniverse.com/podcast/2025/06/30/320-solo-complexity-and-the-universe/> at 2:13:58.

⁴¹ *Poetics* 1452a. For *peripeteia* see F. L. Lucas, "The Reverse of Aristotle," 37 *Classical Review* 98 (1923).