

## Ontological possibility and the Red Queen

“We think we’ve been given a gift, and it turns out to have been a catastrophe.”<sup>1</sup>

Ontological possibility<sup>2</sup> is the most radical instance of phenotypic plasticity<sup>3</sup> to have developed on the planet. Consequently the range and depth of environmental coping and niche-forming is greater in human being than in any other species. West-Eberhard notes “the evolutionary importance of learning and culture—aspects of behavioral plasticity that can speed phenotypic change (e.g. via invention and imitation) and enable plastic individuals to make adaptive decisions among alternative behavioral phenotypes.”<sup>4</sup>

Why is speed in phenotypic change important? Van Valen proposed an explanation with his Red Queen<sup>5</sup> hypothesis; the theory, as Lewontin put it, “that the environment is constantly decaying with respect to existing organisms, so that natural selection operates essentially to enable the organisms to maintain their state of adaptation rather than to improve it.”<sup>6</sup> Organisms have to change as fast as does their environment (which includes other species) in order to stave off extinction. Ontological possibility enables *Homo sapiens* to “run at least twice as fast as that.”

The source for changeability has been heritable variation. Lewontin again:

“For a species to remain in existence in the face of a constantly changing environment it must have sufficient heritable variation of the right kind to

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<sup>1</sup> William H. Gass, *The Tunnel* (1995).

<sup>2</sup> “possibility as an existentiale is the most primordial and ultimate positive way in which Dasein is characterized ontologically.” Martin Heidegger, *Being and Time* (tr. John Macquarrie and Edward Robinson 1962) 183. *Die Möglichkeit als Existenzial dagegen ist die ursprünglichste und letzte positive ontologische Bestimmtheit des Daseins. Sein und Zeit* 143-144.

<sup>3</sup> “Phenotypic plasticity is the ability of a single genotype to produce more than one alternative form of morphology, physiological state, and/or behavior in response to environmental conditions.” Mary Jane West-Eberhard, “Phenotypic Plasticity and the Origins of Diversity,” *20 Annual Review of Ecology and Systematics* 249 (1989).

<sup>4</sup> *Id.* 254.

<sup>5</sup> Alice looked round her in great surprise. “Why, I do believe we’ve been under this tree the whole time! Everything’s just as it was!”

“Of course it is,” said the Queen, “what would you have it?”

“Well, in *our* country,” said Alice, still panting a little, “you’d generally get to somewhere else—if you ran very fast for a long time, as we’ve been doing.”

“A slow sort of country!” said the Queen. “Now, *here*, you see, it takes all the running *you* can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!” Lewis Carroll, *Through the Looking-Glass, and What Alice Found There* (1871).

<sup>6</sup> Richard C. Lewontin, “Adaptation,” *239 Scientific American* 212 (1978) 215. The original paper is Leigh Van Valen, “A New Evolutionary Law,” *1 Evolutionary Theory* 1 (1973).

change adaptively. For example, as a region becomes drier because of progressive changes in rainfall patterns, plants may respond by evolving a deeper root system or a thicker cuticle on the leaves, but only if their gene pool contains genetic variation for root length or cuticle thickness, and successfully only if there is enough genetic variation so that the species can change as fast as the environment. If genetic variation is inadequate, the species will become extinct. The genetic resources of a species are finite, and eventually the environment will change so rapidly that the species is sure to become extinct.”<sup>7</sup>

If ‘invention’ is a kind of variation, and if ‘imitation’ a kind of heritability, then ‘invention and imitation’ together increase the fund of resources enabling species to change adaptively. “It is important to realize,” *per* West-Eberhard, “that plasticity itself is a trait subject to natural selection and evolutionary change.”<sup>8</sup> Vermeij describes the structural moments of such a generalized plasticity:

“Selection operates whenever variants differ in characteristics that are transmitted through replication or some other form of reproduction or retention, and whenever these characteristics are consistently related to performance. . . . Regardless of how variants arise or how information is transmitted, selection occurs through differential culling of variants according to the performance of entities in which these variants are expressed. I reserve Darwin’s term ‘natural selection’ for the differential representation of **genetically** based variants from one generation of organisms to the next.”<sup>9</sup>

The novel dimension of ontological possibility<sup>10</sup> comes closer to ‘plasticity itself’ than anything else we know of. West-Eberhard does not further specify the mechanisms of ‘invention and imitation.’ By placing them in the context of culture and learning she implicitly excludes long-term adaptive processes reliant on *genetic* variation; processes like “making [inventing] a lung with a piece of esophagus,”<sup>11</sup> and plant genitalia’s mimicry (imitation) of the shape of a bee or the odor of damaged leaves.<sup>12</sup> For the case of human being anyhow ‘invention and imitation’ are aspects of the existential *Verstehen*.

As Heidegger writes in the Kant book of 1929,

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<sup>7</sup> “Adaptation” 215. And “to a first approximation,” in David Raup’s famous line, “all species are extinct.”

<sup>8</sup> “Phenotypic Plasticity” 251.

<sup>9</sup> Geerat J. Vermeij, *Nature: An Economic History* (2004) 24 (my emphasis).

<sup>10</sup> “the dimension of the ecstasis of ek-sistence;” Martin Heidegger, “Letter on ‘Humanism’,” in *Pathmarks* (ed. William McNeill 1998) 254.

<sup>11</sup> François Jacob, *The Possible and the Actual* (1982) 35.

<sup>12</sup> Jennifer Brodmann *et al.*, “Orchids Mimic Green-Leaf Volatiles to Attract Prey-Hunting Wasps for Pollination,” 18 *Current Biology* 740 (2008); <https://www.sciencedirect.com/science/article/pii/S0960982208005265>.

“With the existence of human beings there occurs an irruption into the totality of beings, so that now being in itself first becomes manifest, i.e., as being, in varying degrees, according to various levels of clarity, in various degrees of certainty. . . . the understanding—and Fundamental Ontology shows us precisely this—is not just a type of knowing, but on the contrary is primarily a basic moment of existing in general . . .”<sup>13</sup>

For Heidegger ‘understanding,’ *Verstehen*, is “the being of ability-to-be,” *Verstehen ist das Sein . . . Seinkönnens*.<sup>14</sup> The core of *Verstehen* is the phenomenon of the as-structure, *die Als-Struktur*, the ‘as-something.’ The phenomenon of the ‘as’ is

“the structure that belongs to understanding as such [*die zum Verstehen als solchem gehört*].” “The ‘as’ is the basic structure whereby we understand and have access to anything [*die Grundstruktur von Verständnis und Zugänglichkeit*].” “The structure of the ‘as’ is the fundamental hermeneutical structure of the being of that being which we call existence (human life).” “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. . . . [Such an attempt] occurs only *within* an as-structured experience and by prescinding from the ‘as’ – which is the same as admitting that as-structured experience [*das als-hafte Erfahren*] is primary [*Primäre*], since it is what one must first of all prescind from.”<sup>15</sup>

In Heidegger’s fundamental ontology the phenomenon of ‘the clearing,’ *die Lichtung*, enables understanding by illuminating, laying bare, entities *as* for-taking-as.<sup>16</sup> Other animals – chimpanzees, for example<sup>17</sup> – may possess a constrained, non-discursive as-structure, but only

<sup>13</sup> Martin Heidegger, *Kant and the Problem of Metaphysics* (5th ed., enlarged, tr. Richard Taft 1997) 160, 163. *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. . . . Verstehen — das zeigt gerade die Fundamentalontologie — nicht nur eine Art des Erkennens, sondern primär ein Grundmoment des Existierens überhaupt ist . . .* 3 GA 228, 233.

<sup>14</sup> *Sein und Zeit* 144.

<sup>15</sup> Martin Heidegger, *Logic: The Question of Truth* (tr. Thomas Sheehan 2010) 126, 129, 127, 122-123.

<sup>16</sup> Heidegger had many names for the phenomenon of phenomenality, an early one being λόγος: “the λόγος is a letting-something-be-seen [*ein Sehenlassen*] . . . the function of the λόγος lies in merely letting something be seen [*im schlichten Sehenlassen von etwas liegt*], in letting entities be perceived [*im Vernehmenlassen des Seienden*].” *Being and Time* 56, 58.

<sup>17</sup> “To ‘see’ a branch of the tree, so to speak, *as a stick*, is much more difficult.” *Einen Ast des Baumes von diesem gewissermaßen als Stock „loszusehen“, ist schon schwerer.* “not everything that is obviously ‘a part’ for man, is so for the chimpanzee.” *Für den Schimpansen ist nicht alles ohne weiteres „Teil“, was ist für den Menschen ist.* “Under the same objective conditions, visual wholes are probably more easily analysed by the adult human than by the chimpanzee. Man is more likely to see ‘parts’, when he needs them, than the ape.” *Unter gleichen objektiven Bedingungen trennt sich wohl der optische Verband für den erwachsenen Menschen leichter auf als für den Schimpansen, so daß jener im Bedarfsfall viel eher „Teile“ sieht als dieser.* Wolfgang Köhler, *The Mentality of Apes*

human being 'has' the clearing. Animals are 'poor in world,' whereas human being is 'world-forming,' *Weltbildend*. "As projecting, understanding is the kind of Being of Dasein in which it *is* its possibilities as possibilities."<sup>18</sup> Dasein embodies *plastische Kraft*<sup>19</sup> enabled by the clearing.

If indeed ontological possibility, a realm of openness (*ein Offenheitsbereich*), "ontological wiggle-room,"<sup>20</sup> did evolve, how did it evolve?

Richard Lewontin (1929-2021) opposed the research programs of sociobiology and evolutionary psychology insofar as they partake of the adaptationist program: i.e., telling plausible but too often spurious just-so stories of specific adaptive selection for this or that feature of human emotion, cognition, and institutions.<sup>21</sup> In an interview with David Sloan Wilson a few years ago Lewontin even opined that human being is such a far-out *hapax phainomenon* that it's best left apart from the study of evolution:

"I think that the evolution of this thing that's in our cranium, however it happened, has changed all the rules for the history of the species, for its biology, for everything about it. I mean, rational thought and the kind of communication we have with human language, as opposed to the stereotypical communication of other animals, has really made a fantastic change in the conditions of life and the rates of reproduction of individual types and so on. I would say human evolution is in that sense unique because of the possibility of: a) the details of communication; b) the notion of historical memory; well, everything about human thought. I really do think that if we want to understand evolution, the first species we should keep out of our consideration is *Homo sapiens*. I'm sorry, but that's the way it is for me."<sup>22</sup>

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(tr. Ella Winter of *Intelligenzprüfungen an Menschenaffen* (zweite, durchgesehene Auflage 1921) 1925) 106, 109, 110.

<sup>18</sup> *Id.* 185. *Das Verstehen ist, als Entwerfen, die Seinsart des Daseins, in der es seine Möglichkeiten als Möglichkeiten ist.* SZ 145.

<sup>19</sup> "I mean the power distinctively to grow out of itself, transforming and assimilating everything past and alien, to heal wounds, replace what is lost and reshape broken forms out of itself. . . . such a nature would draw its own as well as every alien past wholly into itself and transform it into blood, as it were." Friedrich Nietzsche, *On the Advantage and Disadvantage of History for Life* (tr. Peter Preuss 1980) § 1, p. 10.

<sup>20</sup> "Our essence is to be thrown open and ahead as the ontological wiggle-room required for existentiell acts of *dis-currere*/taking-as, i.e., synthesizing things with some meaning or other. 'To exist,' Heidegger says, 'might be more adequately translated as "sustaining a realm of openness" [*Wahrer ist 'existieren' mit 'aus-stehen eines Offenheitsbereiches' zu übersetzen*]." Thomas Sheehan, "Heidegger Never Got Beyond Facticity" (2017) 8; [https://religiousstudies.stanford.edu/sites/g/files/sbiybj5946/f/heidegger\\_never\\_got\\_beyond\\_facticity\\_0.pdf](https://religiousstudies.stanford.edu/sites/g/files/sbiybj5946/f/heidegger_never_got_beyond_facticity_0.pdf).

<sup>21</sup> See S. J. Gould and R. C. Lewontin, "The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme," 205 *Proceedings of the Royal Society of London B* 581 (1979) and Lewontin, "Adaptation."

<sup>22</sup> David Sloan Wilson, "The Spandrels of San Marco Revisited: An Interview with Richard C. Lewontin" (2015); <https://thisviewoflife.com/the-spandrels-of-san-marco-revisited-an-interview-with-richard-c-lewontin/>. 'Sorry'

“However it happened”—by adaptation? In the sense of “Natural selection shap[ing] the character for a current use”?<sup>23</sup> In light of critiques of the adaptationist program perhaps a more credible view is that ontological possibility is a ‘nonadaptation’: “A character whose origin cannot be ascribed to the direct action of natural selection . . . [that] is coopted for a current use.”<sup>24</sup> In Lewontin’s words, “some traits arise simply as a structural byproduct of selection on other traits,” and in 1979 Gould designated these structural byproducts with the architectural term ‘spandrel.’<sup>25</sup>

According to Gould a spandrel is no part of the plan; it emerges at the physical intersection of components which *are* part of the plan. Spandrels are “the tapering triangular spaces formed by the intersection of two rounded arches at right angles.”<sup>26</sup> A biological example of a spandrel in Gould’s sense is the chin, which in Lewontin’s words

“grows relatively larger in human beings, whereas both infant and adult apes are chinless. Attempts to explain the human chin as a specific adaptation selected to grow larger failed to be very convincing. Finally it was realized that in an evolutionary sense the chin does not exist! There are two growth fields in the lower jaw: the dentary field, which is the bony structure of the jaw, and the alveolar field, in which the teeth are set. Both the dentary and the alveolar fields do show neoteny. They have both become smaller in the human evolutionary line. The alveolar field has shrunk somewhat faster than the dentary one, however, with the result that a ‘chin’ appears as a pure consequence of the relative regression rates of the two growth fields.”<sup>27</sup>

So it may be that ontological possibility – *die Lichtung, das Offene*, and so forth – does not exist in an evolutionary sense; only manifesting at the intersection of other fields (capacities, faculties) which *are* subject to selection (vision, memory, social assessment,<sup>28</sup> wotnot).<sup>29</sup>

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because he was saying this to Wilson, whose research has focused on the evolutionary roots of human behavior and institutions.

<sup>23</sup> Stephen Jay Gould and Elisabeth S. Vrba, “Exaptation—a missing term in the science of form,” 8 *Paleobiology* 4 (1982) 5.

<sup>24</sup> *Ibid.*

<sup>25</sup> In the “Revisited” interview Lewontin attributes all the spandrel-talk to Gould.

<sup>26</sup> “The spandrels of San Marco and the Panglossian paradigm” 581.

<sup>27</sup> Richard C. Lewontin, “Adaptation,” 239 *Scientific American* 212 (1978) 217.

<sup>28</sup> Mary Jane West-Eberhard, *Developmental Plasticity and Evolution* (2001) 462-468.

<sup>29</sup> A close analogy appears in the thought of an ancient empiricist as interpreted by his modern translator: “Of course, the Buddha does not claim that there is no self at all. He offers, instead, a description of the self as *dependently arisen*. . . . The ‘self,’ as a dependently arisen phenomenon, is not a ‘fiction’ but is the by-product of the complex processes that produce human perception and consciousness.” *Early Buddhist Discourses* (ed. tr. John J. Holder 2006) 131.

Howsoever it originally irrupted, the subsequent history of ontological possibility manifests Hegel's *Urphänomen* – “all that is has contradiction at its base, which Hegel asserts often and in multiple ways”<sup>30</sup> – through various avatars: peripeteia in Aristotle's sense,<sup>31</sup> Freud's two kinds of antithetical drives,<sup>32</sup> jeopardy in Hirschman's sense,<sup>33</sup> complexity-induced collapse in Tainter's sense,<sup>34</sup> and morbidity from allostasis in Sterling and Eyer's sense.<sup>35</sup> In Lewontin's terms “a general principle of historical development of any system: that the conditions which make possible the coming into being of a state of the system are abolished by that state.”<sup>36</sup>

Lewontin therefore writes that the Red Queen hypothesis

“is not the same as a constructionist view of the organism and its environment [namely, that organism and environment change one another<sup>37</sup>]. Even if the external world is changing in ways that are completely independent of the organisms, organisms will still have to run to keep up. The constructionist view is that the world is changing *because* the organisms are changing. The Red Queen's running only makes the problem worse.”<sup>38</sup>

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<sup>30</sup> Martin Heidegger, “Basic Principles of Thinking” in *Bremen and Freiburg Lectures: Insight Into That Which Is and Basic Principles of Thinking* (tr. Andrew J. Mitchell 2012) 82.

<sup>31</sup> F. L. Lucas, “The Reverse of Aristotle,” 37 *The Classical Review* 98 (1923).

<sup>32</sup> Sigmund Freud, *Jenseits des Lustprinzips* (1920); “*Psychoanalyse und Libidotheorie*” (1923).

<sup>33</sup> Albert O. Hirschman, *The Rhetoric of Reaction: Perversity, Futility, Jeopardy* (1991).

<sup>34</sup> Joseph A. Tainter, *The Collapse of Complex Societies* (1988).

<sup>35</sup> Peter Sterling and Joseph Eyer, “Allostasis: A New Paradigm to Explain Arousal Pathology,” in *Handbook of Life Stress, Cognition and Health* (ed. S. Fisher and J. Reason 1988) 629; Bruce S. McEwen, “Stress, Adaptation, and Disease: Allostasis and Allostatic Load,” 840 *Annals of the New York Academy of Sciences* 33 (1998).

<sup>36</sup> Richard Lewontin, *The Triple Helix: Gene, Organism, and Environment* (2000) 60. “In the dialectical world view, things are assumed from the beginning to be internally heterogeneous at every level. . . . A second consequence of the heterogeneity of all objects is that it directs us toward the explanation of change in terms of the opposing processes united within that object. . . . For us, contradiction is not only epistemic and political, but ontological in the broadest sense.” Richard Levins and Richard Lewontin, *The Dialectical Biologist* (1985) 272, 278, 279.

<sup>37</sup> Heidegger adopted a constructionist view in his opposition to “the fundamentally misconceived idea that the animal is present at hand, and then subsequently adapts itself to a world that is present at hand, that it then comports itself accordingly and that the fittest individual gets selected. Yet the task is not simply to identify the specific conditions of life materially speaking, but rather to acquire insight into the relational structure between the animal and its environment [*Beziehungsgefüge des Tieres zu seiner Umgebung*] . . . . The organism is not something independent in its own right which then adapts itself. On the contrary, the organism adapts a particular environment into it in each case, so to speak [*der Organismus paßt sich jeweils eine bestimmte Umgebung ein*].” Martin Heidegger, *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude* (tr. William McNeill and Nicholas Walker 1995) 263, 264.

<sup>38</sup> *The Triple Helix* 58. “In the alienated world view, entities may change as a consequence of developmental forces, but the forces themselves remain constant or change autonomously as a result of intrinsic developmental properties. In fact, however, the entities that are the objects of laws of transformation become subjects that change these laws. Systems destroy the conditions that brought them about in the first place and create the possibilities of new transformations that did not previously exist.” *The Dialectical Biologist* 277.

*Accelerating*, by ontological possibility, the Red Queen's running only makes the problem worsen *faster*. The most powerful offspring of ontological possibility, planetary technology, has quickened the Red Queen's pace to the point that abolition of the conditions of possibility of ontological possibility draws near, in evolutionary time just over the horizon. In Darwin's words, "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."<sup>39</sup> So "That is the real peripeteia, not any mere changing chance of circumstance; more tragic than all the tragedies of accident is the truth that, as Zeus observed long ago, men undo themselves."<sup>40</sup> In the jargon we've been using here, ontological possibility undoes itself.

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<sup>39</sup> Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859) 201.

<sup>40</sup> "The Reverse of Aristotle" 103. The allusion is to *Odyssey* I.32-34:

ὦ πόποι, ὅτιον δὴ νῦ θεοὺς βροτοὶ αἰτιῶνται:  
ἐξ ἡμέων γὰρ φασὶ κάκ' ἔμμεναι, οἱ δὲ καὶ αὐτοὶ  
σφῆσιν ἀτασθαλίῃσιν ὑπὲρ μόρον ἄλγε' ἔχουσιν