Heidegger and Darwin: the as-structure and variability *per se*

"Making a lung with a piece of esophagus sounds a lot like making a skirt with a piece of Granny's curtain."

François Jacob[1]

Natural selection produced human being as the first organism capable of hypervariation. As Heidegger says in his idiom, "Humans as the mortals are the first to dwell in the world as world."[2] Heidegger's phenomenology probes the 'how it is' of hypervariant life, the world as world.

Darwin asks, "Why should not Nature have taken a leap from structure to structure?" and replies in terms of his theory: "On the theory of natural selection, we can clearly understand why she should not; for natural selection can act only by taking advantage of slight successive variations; she can never take a leap, but must advance by the shortest and slowest steps." [3]

Natural selection overcame this limitation by developing a new variation-space within which organisms may 'leap.' E. Jablonka and M. J. Lamb call this space the "symbolic dimension."[4] Heidegger had many names for it; among them "the dimension of the possible in general." Heidegger's word to characterize this obscure development is *Einbruch*, 'irruption:' "With the existence of human beings there occurs an irruption into the totality of beings [*Einbruch in das Seiende*], 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]

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[1] *The Possible and the Actual* (1982) 35.
[2] "The Thing" in *Bremen and Freiburg Lectures:* Insight into That Which Is *and* Basic Principles of Thinking (tr. Andrew J. Mitchell 2012) 20.
[3] *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859) 194.
[4] Eva Jablonka and Marion J. Lamb, *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life* (illustr. Anna Zeligowski; rev. ed. 2014).
[5] *Kant and the Problem of Metaphysics* (tr. Richard Taft, 5th ed. enlarged 1997) 160. The form of this sort of event is described by catastrophe theory: "catastrophes have a very precise mathematical meaning . . . a catastrophe occurs when a continuous variation of causes produces a discontinuous variation of effects. In other words, the catastrophe is what upsets *causa aequat effectum*. It is linked with the central idea of discontinuity. When a function, for instance, presents a discontinuity at one point, this point is said to be catastrophic." Alain Boutot, "Catastrophe Theory and its Critics," 96 *Synthese* 167, 168 (1993). Every reader encounters the catastrophic texture of Heidegger's

The formal structure of evolution comprises three moments: variation, selection, and retention. G. J. Vermeij sketches the operation of this formal structure:

> "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. 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."[6]

Evolution in Darwin's sense is understood "as involving gene frequency change;" "gradual quantitative genetic change."[7] 'Evolvability' is the "capacity to generate heritable, selectable phenotypic variation."[8] "The cardinal issue in evolution is the origin of complex and heritable variation from a limited reservoir of components."[9] S. J. Gould takes evolvability as a measure of flexibility: "flexibility for future change manifestly exists in differential degrees among organisms. This flexibility contributes mightily to the longterm macroevolutionary success of lineages, but cannot be directly built or maintained by ordinary natural selection in the organismal mode. We designate this differential capacity for success and extent of future change by the vague and loosely-defined name of 'evolvability.'"[10]

By 'heritable' is standardly meant 'transmittable by genes.' Yet if variation must be transmittable by genes then both variation and retention limit evolvability. The genetic governor on evolvability restricts it to a regime of gradual change, "to advance by the shortest and slowest steps." The evolution of culture allows the intermittent bypassing, and in human being the decoupling of the genetic governor.[11] On this development J. T. Bonner comments that

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ontology—a broken terrain of irruptions, changeovers, breakdowns, lightning flashes, abysses and all manner of suddenness.

[6] Geerat J. Vermeij, *Nature: An Economic History* (2004) 24.

[7] Mary Jane West-Eberhard, "Evolution in the light of developmental cell biology, and *vice versa*," 95 *Proc. Natl. Acad. Sci. USA* 8417, 8418 (1998). Vermeij, *Nature* 24: "I reserve Darwin's term 'natural selection' for the differential representation of genetically based variants from one generation of organisms to the next."

[8] Marc W. Kirschner and John C. Gerhart, "Evolvability," 95 *Proc. Natl. Acad. Sci. USA* 8420 (1998).

[9] Marc W. Kirschner and John C. Gerhart, *The Plausibility of Life: Resolving Darwin's Dilemma* (illustr. John Norton 2005) 8.

[10] Stephen Jay Gould, *The Structure of Evolutionary Theory* (2002) 1271.

[11] "The generation of variation is facilitated principally by: . . . (b) increasing the amount of phenotypic change gained for a given amount of mutational change (or, said in reverse, reducing the number of mutations needed to produce novelty) . . . " Kirschner and Gerhart, *The Plausibility of Life* 224. This component of the theory of facilitated variation has gained additional empirical support in

> "even though culture itself does not involve genetic inheritance or, therefore, Darwinian evolution by natural selection, the ability of any animal to have culture is a direct product of such an evolutionary mechanism. Passing information by behavioral rather than genetic means has made it possible in some cases to pass kinds of information that either cannot be transmitted genetically at all or are less effectively transmitted by genes. Natural selection operates on the genes[12] and only involves gene transmission; yet the power to transmit by behavioral means is as a method adaptively advantageous. Therefore, there has arisen a genetically determined behavioral capacity to transmit information by signs, by language, by imitation."[13]

Bonner's thesis that animals have non-Darwinian culture as a direct product of Darwinian evolution appears to be widely accepted—among biologists at least. So discussing phenotypic plasticity M. J. West-Eberhard writes, "The 'phenotype' includes all aspects of an organism other than the genotype, from the enzyme products of the genes to learned behaviors and the effects of disease." [14] "Selection," she says, "should be seen as acting on phenotypes,[15] and selectable variation means phenotypic variation, whether it has a genetic component or not."[16] "If selectable variation is seen to be phenotypic variation, then the scope for the origins of novelty has to be broadened to include environmentally induced phenotypic variation. Phenotypic development, which responds to both genomic and environmental inputs, is the source of selectable variation."[17] She therefore looks "beyond [genetic] mutation to seek the origins of selectable variation in the developmental plasticity of organisms;"[18] and she uses "a broad concept of selection that encompasses both natural and sexual or social selection."[19] Accordingly, "learning and culture [are] aspects of behavioral plasticity

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the recent discovery of the ability of the octopus and its cousins to edit RNA, DNA's 'messengers,' thus diminishing the need for alteration of the genes. Noa Liscovitch-Brauer *et al.*, "Trade-off between Transcriptome Plasticity and Genome Evolution in Cephalopods," 169 *Cell* 191 (April 6, 2017): http://www.cell.com/fulltext/S0092-8674(17)30344-6

[12] *Cf.* West-Eberhard below: "Selection should be seen as acting on phenotypes."

[13] John Tyler Bonner, *The Evolution of Culture in Animals* (1980) 4.

[14] Mary Jane West-Eberhard, "Phenotypic Plasticity and the Origins of Diversity," 20 *Annu. Rev. Ecol. Syst.* 249, 250 (1989).

[15] *Cf.* Bonner above: "Natural selection operates on the genes."

[16] Mary Jane West-Eberhard, "Developmental plasticity and the origin of species differences," 102 *Proc. Natl. Acad. Sci. USA* 6543 (2005).

[17] *Id.* 6544.

[18] *Ibid.*

[19] *Ibid.*

that can speed phenotypic change (e.g. via invention and imitation) and enable plastic individuals to make adaptive decisions among alternative behavioral phenotypes."[20]

Heidegger anatomizes the plasticity constituting the human world. "We must look around us," he urges, "still more thoroughly and contemplate the narrower and wider sphere within which we dwell, daily and hourly, knowing and unknowing, a sphere that constantly shifts its boundaries and suddenly is broken through."[21] Contemplated in its evolutionary aspect this sphere is 'the extended phenotype,'[22] 'the extended organism,'[23] the 'constructed niche.'[24]

Bonner's primary concern was non-genetic retention, the inheritance and preservation of information by behavioral means. The focus here is variation. Many species, as Bonner shows, have forms of culture; yet none exhibits the degree of plasticity, the hypervariability, of the human form of life.

Heidegger marks this distinction by saying that whereas the animal is poor in world human being is world-***forming*** (*weltbildend*). Human being is the entity in which variation is massively expressed as 'world.'

Heidegger regards the lizard warming itself on a rock in sunlight.

> "it is not true to say that the lizard merely crops up as present at hand *beside* the rock, *amongst* other things such as the sun for example, in the same way as the stone lying nearby is simply present at hand amongst other things. On the contrary, the lizard has its *own relation* to the rock, to the sun, and to a host of other things. One is tempted to suggest that what we identify as the rock and the sun are just lizard-things for the lizard, so to speak. When we say that the lizard is lying on the rock, we ought to cross out the word 'rock' in order to indicate that whatever the

[20] "Phenotypic Plasticity and the Origins of Diversity" 254.
[21] Martin Heidegger, *Introduction to Metaphysics* (tr. Gregory Fried and Richard Polt 2000) 37.
[22] "All effects of a gene upon the world." Richard Dawkins, *The Extended Phenotype: The Long Reach of the Gene* (rev. ed. 1999) 293.
[23] "Animal-built structures . . . are the agents whereby organisms adaptively modify flows of matter and energy through the environment. . . . In such structures, organisms co-opt the environment into a physiology that extends well beyond their conventionally defined boundaries." J. Scott Turner, *The Extended Organism: The Physiology of Animal-Built Structures* (2000) 212.
[24] "Human cultural processes may allow humans to modify and construct their niches with spectacular social and ecological consequences, but in evolutionary terms they represent just one more set of processes in one particular species that results in niche construction." F. John Odling-Smee, Kevin N. Laland, Marcus W. Feldman, *Niche Construction: The Neglected Process in Evolution* (2003) 250.

> lizard is lying on is certainly given *in some way* for the lizard, and yet is not known to the lizard *as* a rock." [25]

He means by this crossing-out "whatever it is [beneath the cross-out] it is not accessible to it [the lizard] *as a being.*" The phenomenology of '***as*** a being' takes up the remainder of that lecture course; the as-structure is what Heidegger means by 'world.'[26]

"The 'as' is the basic structure whereby we understand and have access to anything."[27] "The manifestness of beings as such, of beings *as* beings, belongs to world. This implies that bound up with world is this enigmatic 'as', beings *as* such, or formulated in a formal way: 'something *as* something', a possibility which is quite fundamentally closed to the animal."[28] From this elementary beginning Heidegger leads us to the phenomenon of the plasticity of the as-structure: "Wherever there is world, we find a comportment toward beings as beings. Wherever beings are manifest in such a way, they can be dealt with as something that is, is not, has been, or will be."[29] Projection, *Entwurf,* "raises us away into and thus unveils the dimension of the possible in general, and what is possible is in itself already articulated into possibly 'being in such a way or otherwise' . . ."[30] The "look into the light of the possible makes whatever is projecting open for the dimension of the 'either/or', the 'both/and', the 'in such a way', and the 'otherwise', the 'what', the 'is' and 'is not'."[31]

The dimension of the possible in general is the dimension of variability *per se*; [32] of 'being in such a way or otherwise.'

Abrahamic mythology imagines the Ur-instance of hypervariable plasticity – the human ability to take anything as otherwise – at *Genesis* 3:7 (KJV): "they sewed fig leaves together, and made themselves aprons." Darwin says of natural selection, "The regular course of events seems to be, that a part which originally served for one purpose,

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[25] *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude* (tr. William McNeill and Nicholas Walker 1995) 198.
[26] "This contribution of the as-structure—which is what Heidegger means by 'world'—marks the arrival of meaning in the universe of entities." Thomas Sheehan, *Making Sense of Heidegger: A Paradigm Shift* (2015) 87.
[27] Martin Heidegger, *Logic: The Question of Truth* (tr. Thomas Sheehan 2010) 129.
[28] *Fundamental Concepts of Metaphysics* 274.
[29] *Id.* 323.
[30] *Id.* 364-365.
[31] *Id.* 364.
[32] "Darwin was the first to argue in favor of selection for variability *per se* as part of his 'principle of divergence,' which included the idea that processes that contribute to intra-specific diversification also would enhance the differential survival and multiplication of descendant clades." West-Eberhard, "Evolution in the light of developmental and cell biology, and *vice versa*" 8418.

becomes adapted by slow changes for widely different purposes." Under hypervariation, as Adam and Eve's makeshift illustrates, the process is faster by orders of magnitude; the distance from original to different purpose is closed in the blink of an eye. And the resulting leaf-as-apron is a 'mutation;' a **variant.** "On the same principle," Darwin continues, "if a man were to make a machine for some special purpose, but were to use old wheels, springs, and pulleys, only slightly altered, the whole machine, with all its parts, might be said to be specially contrived for its present purpose. Thus throughout nature almost every part of each living being has probably served, in a slightly modified condition, for diverse purposes, and has acted in the living machinery of many ancient and distinct specific forms."[33]

A central component of Darwin's "one long argument" is the phenomenon of artificial selection. He uses it to illustrate both the power of selection and the fact of variation.

> "Although man does not cause variability and cannot even prevent it, he can select, preserve, and accumulate the variations given to him by the hand of nature in any way which he chooses; and thus he can certainly produce a great result." "It is an error to speak of man 'tampering with nature' and causing variability. If organic beings had not possessed an inherent tendency to vary, man could have done nothing." When man "selects varying individuals, sows their seeds, and again selects their varying offspring" he "may be said to have been trying an experiment on a gigantic scale; and it is an experiment which nature during the long lapse of time has incessantly tried." [34]

Natural and artificial selection are one continuing experiment. Artificial selection is a modality of life's, the one life's,[35] incessant experiment, a modification of descent with modification. The variations given to us by the hand of nature include those we generate by our own *plastische Kraft* in Nietzsche's phrase, 'plastic power.' The various ways, Heidegger writes, of "determining something about something, get modified in accordance with the possible ways of showing-as and with the thing to be shown-as."[36]

"But probably the most important point of all," Darwin writes in the *Origin*, is "that the animal or plant should be so highly useful to man, or so much valued by him, that the closest attention should be paid to even the slightest deviation in the qualities or

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[33] *The Various Contrivances by which Orchids are Fertilised by Insects* (2d ed., rev. 1877) 282, 283-284.
[34] *The Variation of Animals and Plants Under Domestication* (1868) Vol. I: 3, 2, 3.
[35] "All we know is that today there is only a single lineage of life (that is, a single DNA-RNA protein machine and a single metabolism)." *The Plausibility of Life* 256.
[36] *Logic: the Question of Truth* 129.

structure of each individual."[37] The animal or plant should be meaningfully present, salient in its usefulness or value.

For Heidegger meaningful presence itself comes about through the 'as' "of the primary understanding," the 'as' "that does the primary uncovering."[38] In *Being and Time* he starts to call this primary as-structure 'the clearing.'[39] "In carrying out a statement in the form of predication," and in any other concrete taking-as, "the '*as*' of the primary understanding is simultaneously flattened out into the pure and simple determination of a thing." This is the "leveled-down 'as' that enacts a determination."[40]

The human selector, in Heidegger's terms, is attuned in its primary understanding to the "possibly 'being in such a way or otherwise'" of the individual meaningful presence. By "individual" Darwin means 'individual organism.' Heidegger shows that in large measure the "individuals" of the human world are "things;" things meaningfully present, things-for-a-purpose. We live by and through things as instrument, apparatus, equipment, gear, kit, rig, *Zeug* – all for accomplishing what matters to us. Yet "In our concernful dealings," Heidegger says, "we not only come up against unusable things [because defective, unsuitable, etc.] *within* what is ready-to-hand already; we also find things which are missing—which not only are not 'handy' [*handlich*] but are not 'to hand' [*zur Hand*] at all."[41] How to cope?

"We do not just bump up against things," Sheehan writes, "but in fact have always already transcended them by (1) understanding their possible meanings and in terms of that (2) returning to those things in order to render them present in terms of those meanings." He illustrates:

> "Say I'm camping and need to pound in tent pegs to set up some shelter against the coming rain. I live 'ahead' in the need of shelter—and then, coming 'back' from that need, I look around for my mallet . . . and realize I have forgotten it. So, instead, I 'come back' from my purpose ('gotta

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[37] *Origin* 41.

[38] *Logic* 129.

[39] "To say that Dasein is 'illuminated' means that *as* Being-in-the-world it is cleared [*gelichtet*] in itself, not through any other entity, but in such a way that it *is* itself the clearing [*die Lichtung*]." *Being and Time* (tr. John Macquarrie and Edward Robinson 1962) 171. A late formulation: "When we say the word 'as,' we are always dealing with a predication of something about something. Being open is only possible when the clearing has already happened to us so that something can be present or absent." *Zollikon Seminars: Protocols—Conversations—Letters* (ed. Medard Boss; tr. Franz Mayr and Richard Askay 2001) 145.

[40] *Logic* 129.

[41] *Being and Time* 103.

> hammer in those tent pegs') to that stone over there, which I can use for that purpose and which I therefore 'make meaningfully present' as an ersatz mallet. [Now quoting Heidegger] 'Coming back to things with understanding means . . . letting ourselves encounter them by rendering them meaningfully present.'"[42]

In this illustration the encounter with absence (*cf.* "they saw they were naked") prompts the repurposing of something already meaningfully present as 'just there' in the *Umwelt* to meet the need for something useful, 'ready to hand,' in the *Zeugwelt.*

"Equipment" is often enough the conceptual apparatus of a practice. The life of the common law, for example, has proceeded by cobbling workarounds out of shop materials; or as S. F. C. Milsom puts it, "in the abuse of its elementary ideas."

> "Institutions begin in expedients. An immediate problem arises: an immediate solution is found. Nobody can know that the solution will later be seen as the origin of something, or the problem as the effective end of something else. . . . the mechanism of change within the common law had been to allow one writ to do the work formerly done by another. . . . If the rules of property give what now seems an unjust answer, try obligation; and equity has proved that from the materials of obligation you can counterfeit the phenomena of property. If the rules of contract give what now seems an unjust answer, try tort. Your counterfeit will look odd to one brought up on categories of Roman origin; but it will work. If the rules of one tort, say deceit, give what now seems an unjust answer, try another, try negligence. And so the legal world goes round."[43]

But counterfeiting the phenomena of property from the materials of obligation is just Darwin's illustration of making a special-purpose machine from spare parts. As modern biologists express it, "Darwin's theory of evolution is based on descent with modification, wherein everything new, ultimately, must come from something old."[44] "Evolution can only yield variants of that which it has already produced."[45]

"Looking back through billions of years of change, everything innovative or apparently unique in the history of life is really just old stuff that has been recycled, recombined,

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[42] *Making Sense of Heidegger* 147-148.
[43] S. F. C. Milsom, *Historical Foundations of the Common Law* (2d ed. 1981) 16, 25, 6.
[44] Armin P. Moczek *et al.,* "The role of developmental plasticity in evolutionary innovation," 278 *Proc. R. Soc. B* 2705 (2011).
[45] Leo W. Buss, *The Evolution of Individuality* (1987) 34.

repurposed, or otherwise modified for new uses."[46] This is Nietzsche's "major point of historical method [*Haupt-Gesichtspunkt der historischen Methodik*];" namely, "that the origin of the emergence of a thing and its ultimate usefulness, its practical application and incorporation into a system of ends, are *toto coelo* separate; that anything in existence, having somehow come about, is continually interpreted anew, requisitioned anew, transformed and redirected to a new purpose."[47] The term 'hypervariation' is meant to characterize both the tempo and the mode of this phenomenon as it manifests in human existence.[48]

For Heidegger 'extendability' characterizes the human being's relation to its world (niche), the 'how' of human being's world-forming. In contrast to that of other animals,

> "the world of man is a rich one, greater in range, far more extensive in its penetrability, constantly extendable, not only in its range (we can always bring more and more beings into consideration) but also in respect to the manner in which we can penetrate ever more deeply in this penetrability. . . . Consequently we can characterize the relation man possesses to the world by referring to the extendability of everything that he relates to. This is why we speak of man as world-forming."[49]

We can always bring more and more beings into consideration by fashioning new beings from those on hand, taking them as something otherwise than their original role or function.[50] The world as manifest in everydayness, *Alltäglichkeit*, is one of beings 'just there,' for taking as something objective, objects present at hand. 'At first and for the

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[46] Neil Shubin, *Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body* (2008) 201.

[47] *On the Genealogy of Morality: A Polemic* (tr. C. Diethe 1994) Second essay, section 12; p. 55. Darwin had said it: "The illustration of the swimbladder in fishes is a good one, because it shows us clearly the highly important fact that an organ originally constructed for one purpose, namely flotation, may be converted into one for a wholly different purpose, namely respiration." *Origin* 190. Wrong about the swimbladder as it turns out but the principle stands: "Current utility and historical origin are different subjects. Any feature, regardless of how or why it first evolved, becomes available for co-optation to other roles, often strikingly different." Stephen Jay Gould, "Quick Lives and Quirky Changes," in *Hen's Teeth and Horses' Toes: Further Reflections in Natural History* (1983) 63.

[48] 'Tempo' "has to do with evolutionary rates under natural conditions, the measurement and interpretation of rates, the conditions of exceptionally slow or rapid evolution, and phenomena suggestive of inertia and momentum. . . . The group of related problems implied by the word 'mode' involves the study of the way, manner, or pattern of evolution . . . . The purpose is to determine how populations became genetically and morphologically differentiated, to see how they passed from one way of living to another or failed to do so, to examine the figurative outline of the stream of life and the circumstances surrounding each characteristic element in that pattern." George Gaylord Simpson, *Tempo and Mode in Evolution* (1944; repr. with new introduction by author 1984) xxix-xxx.

[49] *Fundamental Concepts of Metaphysics* 193.

[50] That Heidegger was past master of this art with language is attested by his repurposing of the words Dasein, alētheia, deinos, Lichtung, Ereignis, Gestell, and the rest of the lexicon of Heideggerese.

most part' *Alltäglichkeit* is our primary way of being. Heidegger points to it over and over again:

> "at first and for the most part in the *everydayness* of our Dasein we let beings come toward us and present themselves before us in a remarkable undifferentiatedness. . . . We board the tram, talk to other people, call the dog, look up at the stars, all in the same way—humans, vehicles, human beings, animals, heavenly bodies, everything in the same uniformity of what is present at hand."[51]

Prior discussion had shown that "manifold kinds of beings are manifest to us: material things, living nature, history, products of human work, culture." And "we are very sensitive to the substantive manifoldness of those beings that surround us, we can never have enough variety and eagerly look out for what is new and different." And yet

> "here the beings that surround us are *uniformly manifest* as simply *something present at hand in the broadest sense*—the presence of land and sea, the mountains and forests, and within this the presence of animals and plants and the presence of human beings and the products of human work, and amongst all this the presence of ourselves as well. This character of beings as something simply present at hand in the broadest sense cannot be insisted upon too strongly . . . ."[52]

Cannot be insisted upon too strongly because this "all too self-evident phenomenon is what is most powerful in our Dasein."[53] Most powerful because this everyday comportment "is uprooted and for that very reason is rampant and successful everywhere."[54] Under the aspect of everydayness 'all is there' for taking-as: material things, living nature, history, products of human work, culture. As Gould puts the point, "organisms and populations maintain what we might call a 'fund' or 'pool' of potential utilities now doing something else, or at least doing no harm." This reserve is a "ground of evolvability" which he proposes to name "The Exaptive Pool."[55]

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[51] *Fundamental Concepts of Metaphysics* 275.
[52] *Ibid*.
[53] *Ibid*.
[54] *Id.* 276.
[55] *The Structure of Evolutionary Theory* 1277. "Features coopted as exaptations have two possible previous statuses. They may have been adaptations for another function, or they may have been non-aptive structures. The first has long been recognized as important, the second underplayed. Yet the enormous pool of nonaptations must be the wellspring and reservoir of most evolutionary flexibility. We need to recognize the central role of 'cooptability for fitness' as the primary evolutionary significance of ubiquitous nonaptation in organisms. In this sense, and at its level of the phenotype, this nonaptive pool is an analog of mutation—a source of raw material for further selection." Stephen Jay Gould and Elisabeth S. Vrba, "Exaptation—a missing term in the science of

The *Alltäglichkeit* in *Being and Time* and its outriders is the proto-version of the *Ge-stell* in Heidegger's post-war corpus. The everyday comportment of Dasein scaled up to higher levels of organization shows up in the later work as positionality, *das Ge-stell*, "the essence of technology." Positionality takes nature *as* "standing-reserve," *der Bestand*; as resource, material, energy, data, information, inventory; *for* felling, harvesting, extracting, quarrying, harnessing, processing. The uprooted, rampant, ubiquitous success of everyday comportment thus scaled up has made it possible for human niche-making to—so we tell ourselves—dominate the planet. At the planetary scale "Nature becomes a gigantic gasoline station, an energy source for modern technology and industry."[56]

"A high degree of variability," Darwin notes, "is obviously favourable, as freely giving the materials for [man's power of] selection to work on."[57] The high degree of plasticity in taking-as (being) and the abundant contents of the reservoir (beings) form two poles of a positive feedback loop: **the ontological difference is a variant-generator circuit**. To alter slightly a sentence of Gould's: no expansion of variability can be more profound than the introduction of a new dimension, orthogonal to previous modes.[58]

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form," 8 *Paleobiology* 4, 12 (1982). As Heidegger points out the extent of the nonaptive pool underwent sudden inflation with the irruption of Dasein, when meaning went from nowhere to everywhere.

[56] Martin Heidegger, *Discourse on Thinking* (tr. John M. Anderson and E. Hans Freund 1966) 50.

[57] *Origin* 40.

[58] "Darwin literally added a new dimension to the debate—the axis of history. (And no intellectual expansion can be more profound than the introduction of a new dimension, orthogonal to previous modes of explanation.)" *The Structure of Evolutionary Theory* 253.