

The Light Switch and the sixth extinction

“All is possible when emptiness is possible.
Nothing is possible when emptiness is impossible.”¹

You can't read for very long in a modern biology text without running into “the Nietzsche-Darwin principle.”² In their monograph on animal eyes, for example, Land and Nilsson take up the evolution of vision. By their account a pre-existent structure – the opsin proteins – which predated any animal eye got co-opted and repurposed ‘for seeing.’ That pre-existent structures continually get co-opted and repurposed just is the N-D principle.³ The authors write,

“A number of different light-harvesting and light-sensing molecules are used by plants and bacteria, but in animals there are just a few light-sensing [molecular] systems, and only one of these is used for vision. The opsin proteins, binding a light-sensitive vitamin A derivative, are responsible for vision in all animals from jellyfish to man, and this molecular system is unique to animals. . . . The genetic control of eye development, including especially the *Pax6* control gene, also displays obvious similarities across the animal kingdom, and this has been taken as evidence that the last common ancestor of all animals already had eyes. But there are good reasons for being cautious here because the similarities may date back to the first expression of animal opsins, before they became part of any eye. Developmental genetic networks are generally known to be conservative, whereas the structures and functions they control may be subject to dramatic modifications or innovations. It is also possible, and perhaps likely, that a genetic control network originally used for local expression of an opsin, has repeatedly been co-opted for use in new places of the nervous system or epidermis, whenever light sensitivity has been called for.”

Repeatedly been co-opted:

“Even though the eyes of vertebrates, arthropods, squid, and jellyfish develop in very different ways from different tissues, and are largely the result of convergent evolution, they share deep homologies in the molecular components that they are composed of. This implies that ancient molecular modules, serving

¹ Mark Siderits and Shōryū Katsura, *Nāgārjuna's Middle Way: Mūlamadhyamakakārikā* (2013) 24.14, p. 275-276. *Sarvaṃ ca yujyate tasya śūnyatā yasya yujyate/ sarvaṃ na yujyate tasya śūnyam yasya na yujyate.*

² So christened by Stephen Jay Gould in *The Structure of Evolutionary Theory* (2002) 1214 and following.

³ “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, repurposed, or otherwise modified for new uses.” Neil Shubin, *Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body* (2008) 201.

gene expression or physiological function, have repeatedly been recruited and co-opted for similar purposes in parallel lines of eye evolution in different branches of the animal phylogenetic tree.”⁴

The heuristic moral of such histories is, in Nietzsche’s view, that “the cause of the origin of a thing and its eventual utility, its actual employment and place in a system of purposes, lie worlds apart; whatever exists, having somehow come into being, is again and again reinterpreted to new ends, taken over, transformed, and redirected by some power superior to it.”⁵

The *überlegenen Macht* which co-opted opsins for vision was selection pressure. In any system of variation-selection-retention variation is the raw material of change on which environmental and competitive exigencies ‘exert pressure;’ the resultant is the direction of change.⁶

Animals are practically defined as sighted organisms. The ‘good’ of vision is survival advantage; in the waters of the blind the newly sighted dine best:

“It is tempting to speculate that a few species of late Precambrian animals became large enough to acquire good spatial vision and improved mobility, and became the first visually-guided predators. Such an ecological invention would have put a tremendous selection pressure on a large part of the fauna, and forced other species to evolve protective measures such as body armour or shells, avoiding exposure by deep burrowing, or developing good vision and

⁴ Michael F. Land and Dan-Eric Nilsson, *Animal Eyes* (2nd ed. 2012) 6, 7, 8. Thus illustrating again “a point of considerable interest: often during the course of evolution an existing substance will be commandeered for a new role. Innovations in biochemical pathways often show the signs of opportunism; they make use of a substance that is already there serving some other purpose.” John Tyler Bonner, *The Social Amoebae: The Biology of Cellular Slime Molds* (2009) 44.

⁵ Friedrich Nietzsche, *On the Genealogy of Morals* (tr. Walter Kaufmann and R. J. Hollingdale 1967) Second Essay, section 12, p. 77. *die Ursache der Entstehung eines Dings unde dessen schliessliche Nützlichkeit, dessen thatsächliche Verwendung und Einordnung in ein System von Zwecken toto coelo auseinander liegen; dass etwas Vorhandenes, irgendwie Zu-Stande-Gekommenes immer wieder von einer ihm überlegenen Macht auf neue Ansichten ausgelegt, neu in Beschlag genommen, zu einem neuen Nutzen umgebildet und umgerichtet wird.* In Darwin’s words: “When this or that part has been spoken of as adapted for some special purpose, it must not be supposed that it was originally always formed for this sole purpose. The regular course of events seems to be, that a part which originally served for one purpose, becomes adapted by slow changes for widely different purposes. . . . 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.” Charles Darwin, *The Various Contrivances by which Orchids are Fertilised by Insects* (2nd rev. ed. 1877) 282, 283-284.

⁶ The wider the domain of variants on which a suite of selection pressures can act, the greater the range of products of selection. “A high degree of variability is obviously favourable [to human being’s power of selection], as freely giving the materials for selection to work on.” A high degree of variability is just as obviously favorable to **natural** selection. Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859) 40.

mobility themselves. These possibilities indeed reflect the key characteristics of the early Cambrian faunas, supporting the idea that the introduction of visually-guided predation altered much of the ecological system and fuelled the Cambrian explosion. Because both vision and speed of locomotion can be improved by general increase in size, visually-guided predation offers an understanding of the very sudden appearance of macroscopic animals. In this scenario the small shelly fauna may have been the very first stages of an arms race between predators and prey, where rigid structures for protection and mobility evolved along with the first real eyes.”⁷

As Land wrote in an earlier article, “Since the earth formed more than 5 billion years ago, sunlight has been the most potent selective force to control the evolution of living organisms. Consequences of this solar selection are most evident in eyes, the premier sensory outposts of the brain.”⁸ Andrew Parker comments, “This is true for life in general, particularly those forms that photosynthesise, but for *animals*, barring the inefficient sense of simple light perception, it is true for the past 543 million years only.” I.e. since the Cambrian explosion. Parker goes on, “If one divides the history of the Earth into pre- and post-eyes, then considering the power of vision – generally the most potent selective force for animals today – its day of birth must have been a monumental event in the history of life.”⁹

Parker therefore takes the speculation mentioned by Land and Nilsson and articulates a full-blown theory to explain the unprecedented and unrepeated radiation of faunal diversity called the Cambrian explosion. His conclusion:

“So it seems the evolution of hard parts everywhere, and ultimately the evolution of body forms of multicelled animals, was driven by active predators. This process *was* the Cambrian explosion. But it was triggered by the evolution of the eye. . . . The Cambrian explosion saw the writing of The Laws of Life as it exists today. The introduction of the first eye effectively tore up the previous Laws and gave rise to chaos among animals, creating a scenario without laws. It would have put evolution into top gear, perhaps moving it up from its lowest; fresh rules were required now. All animals needed to evolve to be adapted to vision before they were eaten, or before they were outwitted by their prey. The Early Cambrian thus became a race for adaptation to vision. This scramble for the newly available niches, this chaos during the writing of today’s Laws of Life,

⁷ *Id.* 5-6. So the thesis here: *Ereignis*-enabled domination offers an understanding of the very sudden disappearance of many macroscopic species. For documentation of evolution as arms race see Geerat Vermeij, *Evolution and Escalation: An Ecological History of Life* (1987).

⁸ Michael F. Land and Russell D. Fernald, “The Evolution of Eyes,” *15 Annual Review of Neuroscience* 1 (1992).

⁹ Andrew Parker, *In the Blink of an Eye* (2003) 289-290.

was the Cambrian explosion. So finally we can be sure we have our answer. *The Cambrian explosion was triggered by the sudden evolution of vision.*"¹⁰

Parker says his new explanation of the 'why' of the Cambrian explosion "has become known as the 'Light Switch' theory."¹¹

'Light Switch' also serves well to designate Heidegger's notion of 'the clearing;' namely that "With the existence of human beings there occurs an irruption into the totality of beings, so that now [*jetzt*] the being in itself [*an ihm selbst* (?)] first [*erst*] becomes manifest, i.e., as being, in varying degrees, according to various levels of clarity, in various degrees of certainty."¹²

Thomas Sheehan emphasizes the radicality of this innovation in the history of life:

"With the appearance of human being, meaning dawned in the universe, and nothing has been the same since. For the first time in the 13.7 billion years of the cosmos, things were no longer just 'out there' but instead became meaningfully present (*anwesend*). As far as we know, only human beings can question things, recognize them for what they are in themselves [?], name them, talk about them in soliloquy or dialogue, and even talk about that talking. Once man is possessed by the Promethean fire of intellect and language, human history begins as a complex unfolding of meaningful lives."¹³

The resultant unfolding of varieties of human existence – techno-cultural diversity – is analogous to the radiation of diversity of fauna in the Cambrian; with the crucial difference that in the Anthropocene diversification is confined to a single species. Moreover rather than precipitating an increase in the diversity of contemporaneous biota the Anthropocene explosion – through a manifold crowding-out effect – is measurably reducing that diversity.¹⁴ In other words our success in diversification – "the complex unfolding of meaningful lives" – has been achieved at the cost of impoverishment of the rest of the biosphere. When the question arises "how far the existence of a worthwhile life for [human being] involves the imposition of

¹⁰ *Id.* 279. His italics.

¹¹ *Id.* 45.

¹² Martin Heidegger, *Kant and the Problem of Metaphysics* (5th ed. tr. Richard Taft 1997) 160. *Mit der Existenz des Menschen geschieht ein Einbruch in das Ganze des Seienden dergestalt, daß jetzt erst das Seiende in je verschiedener Weite, nach verschiedenen Stufen der Klarheit, in verschiedenen Graden der Sicherheit, an ihm selbst, d.h. als Seiendes offenbar wird.* GA3.228.

¹³ Thomas Sheehan, "Astonishing! Things Make Sense!," 1 *Gatherings: The Heidegger Circle Annual* 1 (2011).

¹⁴ Well told in Elizabeth Kolbert, *The Sixth Extinction* (2014). See now, Yinon M. Bar-On et al., "The biomass distribution on Earth," 115 *PNAS* 6506 (2018) <https://www.pnas.org/content/pnas/115/25/6506.full.pdf>. As Francis Gooding puts it, "All the News is Bad," 41 *London Review of Books* (August, 2019) <https://www.lrb.co.uk/the-paper/v41/n15/francis-gooding/all-the-news-is-bad>

suffering on [other species]” the reply comes back ‘however far we please.’¹⁵ For the present then by putting extinction rate “into top gear” human existence has become “the most potent selective force to control the evolution of living organisms.”

Wittgenstein invokes the image of the Light Switch when he remarks:

“The evolution of the higher animals and of man, and the awakening of consciousness at a particular stage. The picture is something like this: Though the ether is filled with vibrations, the world is dark. But one day, man opens his seeing eye, and there is light [*und es wird hell*].”¹⁶

Wittgenstein goes on to say that this is a picture, *ein Bild*, and that “What is to be done with the picture, how it is to be used [*wie es zu verwenden ist*], is obscure.”

Heidegger’s accounts of this picture emphasize the disclosure of possibility, *Möglichkeit*. In a lyrical passage he writes,

“The look into the light [of a possible making-possible] tears darkness as such along with it, gives the possibility of that dawning of the everyday in which at first and for the most part we catch sight of beings, cope with them, suffer from them, and enjoy ourselves with them. 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 ‘otherwise’, the ‘what’, the ‘is’ and ‘is not’. Only insofar as this irruption has occurred do the ‘yes’ and ‘no’ and questioning become possible. The projection raises us away into and thus unveils the dimension of the possible in general [*die Dimension des Möglichen überhaupt*],

¹⁵ Williams wrote “a worthwhile life for some people . . . on others.” Bernard Williams, *Shame and Necessity* (1993) 125. “If therefore nature makes nothing without purpose or in vain, it follows that nature has made all the animals for the sake of men.” εἰ οὖν ἡ φύσις μηθὲν μήτε ἀτελὲς ποιεῖ μήτε μάτην, ἀναγκαῖον τῶν ἀνθρώπων ἔνεκεν αὐτὰ [ζῷα] πάντα πεποιηκέναι τὴν φύσιν. Aristotle, *Politics* 1256b (tr. H. Rackham). “Save men we do not know any particular thing in nature in whose mind we may rejoice or which we may join to us in bonds of friendship or any other kind of association: therefore the consideration of our own advantage does not demand that we preserve whatever exists in nature besides men. Instead, it teaches us that we should preserve or destroy it according to its usefulness, or adapt it to our use in any manner we please.” *Praeter homines nihil singulare in natura novimus, cuius mente gaudere et quod nobis amicitia aut aliquo consuetudinis genere iungere possumus; adeoque quicquid in rerum natura extra homines datur, id nostrae utilitatis ratio conservare non postulat, sed pro eius vario usu conservare, destruere, vel quocumque modo ad nostrum usum adaptare nos docet.* Spinoza, *Ethics*, Part IV, Appendix para. XXVI (tr. R. H. M. Elwes).

¹⁶ Ludwig Wittgenstein, *Philosophical Investigations* (tr. G. E. M. Anscombe, P. M. S. Hacker, Joachim Schulte; rev. 4th ed. Hacker and Schulte 2009) II.vii.55. *Die Evolution der höheren Tiere und des Menschen und das Erwachen des Bewußtseins auf einer bestimmten Stufe. Das Bild ist etwa dies: Die Welt ist, trotz aller Ätherschwingungen, die sie durchziehen, dunkel. Eines Tages aber macht der Mensch sein sehendes Auge auf, und es wird hell.*

and what is possible is in itself already articulated into possibly 'being in such a way or otherwise', into the possibility of 'being or not being'.¹⁷

What is 'the possible in general'? In the "crucial section"¹⁸ of *Being and Time* the possible is co-extensive with the retrievable as repurposable. Section 74 inquires about "the source from which *in general* openness [Dasein] draws the possibilities through which it specifically understands itself."¹⁹ That source turns out to be 'the heritage,' *das Erbe*:

"Resolution [*Entschlossenheit*], whereby openness returns to itself, opens up [*erschließt*] one's current, specific possibilities for authentic existence *from out of the heritage [aus dem Erbe]* that resolution, as thrown, *takes over*. The resolute return to one's thrownness entails *freeing up for oneself [ein Sichüberliefern]* those inherited possibilities, although not necessarily *as* inherited. Granted that everything 'good' is our heritage [*Erbschaft*] and that the nature of 'the good' is to make authentic existence possible, the actual freeing up of a heritage [*das Überliefern eines Erbes*] takes place in resolution."²⁰

Retrieval, *Wiederholung*, is "the act of explicitly freeing-up, i.e., explicitly returning to the possibilities found in already-openness [*des dagewesenen Daseins*]." But "not in order to reactualize [*nicht, um es abermals zu verwirklichen*] an already-open openness [*das dagewesene Dasein*]." (So 'repetition' mistranslates *Wiederholung* in this context.) Rather, "retrieval makes a response to a given possibility of already-open existence."²¹ Macquarrie and Robinson comment that "The idea seems to be that in resolute repetition one is having, as it were, a conversation with the past"²²

For their part Sheehan and Painter comment to the effect that authentic, resolute retrieval is a special case of the general phenomenon of human history: "Whereas having *any* kind of history means choosing among inherited possibilities and living into the future in terms of them, having

¹⁷ Martin Heidegger, *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude* (William McNeill and Nicholas Walker tr. 1995) 365.

¹⁸ Thomas Sheehan and Corinne Painter, "Choosing One's Fate: A Re-Reading of *Sein und Zeit* §74," 29 *Research in Phenomenology* 63 (1999). *woher überhaupt die Möglichkeiten geschöpft werden können, auf die sich das Dasein faktisch entwirft*.

¹⁹ *Id.* 64.

²⁰ *Id.* 65. Compare with *das Erbe* Pocock's notion of 'paradigm': "a conceptual constellation performing a diversity of authoritative functions;" "an activity of communicating and distributing authority by linguistic means;" "linguistic constructs recognized as carrying increasingly complex loads of biases, but at the same time carrying loads in excess of what can be predicted or controlled at a given moment." J. G. A. Pocock, *Politics, Language, and Time: Essays on Political Thought and History* (U. Chicago Pr. ed. 1989) 277, 14, 287.

²¹ *Id.* 67, 68.

²² Martin Heidegger, *Being and Time* (tr. John Macquarrie and Edward Robinson 1962) 438 fn.1.

an *authentic* history means making those choices in the light of the mortal becoming that is embraced in resolution.”²³

So in the general case also one chooses from *das Erbe* for the purpose of “living into the future,” of making one’s way. The difference between authentic and inauthentic choice appears to rest in the extent of freedom for repurposing, redirecting, and so on. Whereas inauthentic choice takes the inherited possibilities as simply given ‘in themselves’ for reactualizing or not, authentic choice takes them as ‘empty,’ for reinterpreting and refabricating to cope with one’s thrown circumstances. As Heidegger says, “one first makes the liberating choice to struggle with the tradition that one follows and to be faithful to what can be retrieved from it.”²⁴ The result may well be “dramatic modifications or innovations” hardly recognizable, even repugnant, to other inheritors of that same tradition.

In a different context the phenomenon of retrieval from *das Erbe* shows again a greater and a lesser range of freedom. Lévi-Strauss asks us to consider the bricoleur “at work and excited by his project. His first practical step

is retrospective. He has to turn back to an already existent set made up of tools and materials, to consider or reconsider what it contains and, finally and above all, to engage in a sort of dialogue with it and, before choosing between them, to index the possible answers which the whole set can offer to his problem. He interrogates all the heterogeneous objects of which his treasury is composed to discover what each of them could ‘signify’ and so contribute to the definition of a set which has yet to materialize but which will ultimately differ from the instrumental set only in the internal disposition of its parts.”²⁵

Though bricolage “can reach brilliant unforeseen results” on the technical plane, nevertheless its “possibilities always remain limited by the particular history of each piece and by those of its features which are already determined by the use for which it was originally intended or the modifications it has undergone for other purposes.”²⁶ The bricoleur’s materials are thus “pre-constrained” by these factors which together set a limit on his freedom of manoeuver.

Though by a different route the engineer finds himself in the same predicament. The engineer “no doubt also cross-examines his resources.”

²³ “Choosing One’s Fate” 75.

²⁴ *Id.* 67.

²⁵ Claude Lévi-Strauss, *The Savage Mind* (tr. Anon. 1966) 18.

²⁶ *Id.* 19.

“The existence of an ‘interlocutor’ is in his case due to the fact that his means, power and knowledge are never unlimited and that in this negative form he meets resistances with which he has to come to terms. . . . the scientist never carries on a dialogue with nature pure and simple but rather with a particular relationship between nature and culture definable in terms of his particular period and civilization and the material means at his disposal. He is no more able than the ‘bricoleur’ to do what he wishes when presented with a given task. He too has to begin by making a catalogue of a previously determined set consisting of theoretical and practical knowledge, of technical means, which restrict the possible solutions.”²⁷

Lévi-Strauss then remarks the critical difference between the engineer’s and the bricoleur’s respective relation to *das Erbe*: “The engineer is always trying to make his way out of and go beyond the constraints imposed by a particular state of civilization while the ‘bricoleur’ by inclination or necessity always remains within them.”²⁸

The bricoleur is ‘captivated,’ *benommen*, in Heidegger’s term,²⁹ by *das Erbe* whereas the engineer is not: the engineer seeks to access a further dimension of possibility.

An analogous polarity is the basis of Pocock’s distinction between classical and romantic politics. “Classical man’s attitude,” Pocock writes,

“towards his paradigms and traditions is critical; between the two extremes of erecting the paradigm into timeless unassailability and subjecting his intellect to the inapprehensibility of tradition, he explores both paradigm and tradition, using them, arguing over their use, inquiring into their diverse meanings and functions, and generally conducting that process of strategic conversation which is subsumed under the notion of paradigm change. . . . Classical man tends to assume that he has an identity and to inquire what can be done with it; his political action is civic, an operation outwards from his presumed identity towards the presumed identities of other beings.”³⁰

By contrast romantic man’s attitude towards the same phenomena

“is better characterized as dialectical; being far more concerned with ego, self-expression and identity, he sees linguistic, cultural and political structures as the institutionalized means of self-expression and self-creation; but his characteristic

²⁷ *Id.* 19.

²⁸ *Ibid.*

²⁹ *Fundamental Concepts of Metaphysics* §§ 58-60.

³⁰ *Politics, Language, and Time* 275.

posture is one of opposition and rebellion towards such structures. . . . Romantic man tends to assume that his identity requires to be asserted or discovered, and that hostile agencies are operating to thrust an identity not his own upon him; his political action is revolutionary, a transformation of the self, a reconstruction of the conditions under which selves are to be created, and an engagement in the presumed self-creation of others.”³¹

This axis of polarity – inauthentic/authentic, bricoleur/engineer, classical/romantic, etc. – repeats at the intraspecies scale the polarity of poor-in-world/world-forming at the interspecies scale which Köhler’s work documented.

Köhler’s intelligence-testing of chimpanzees showed the difference between their problem-solving capacity and ours to consist primarily in their relatively constricted capacity to see the possibilities presented by the problem situation.³²

These apes do possess a measure of capacity to ‘take things as.’ The prime example is their stick-use. “The stick,” Köhler writes, “is a sort of general tool [*eine Art Universalinstrument*] in the chimpanzees’ hands; it can be turned to account in almost any circumstances.” And its range of use can be extended. “When its use has become common knowledge and property, its functions extend and vary [*wurde seine Funktion mannigfaltiger*] from month to month.”³³ The chimps used sticks to dig for roots, to fish for ants, to beat vermin to death, to torment chickens, to strike down food hanging out of reach, etc.

And the chimps are capable of going the other way, of taking other things as sticks, the general tool. Consider Koko who, in the course of a test for getting food placed beyond his reach outside his cage,

“ignored the stick which lay a little to one side and on the periphery of his ‘sphere of action.’ Only after some time did he grasp the stick with his foot, and thus drew the bananas, clumsily enough, towards him. On a repetition of the experiment, he fetched his blanket and dragged it close to the objective, then let it fall after a short hesitation, and took up the stick once more. A day later, when no stick was available, he repeated the blanket procedure exactly, and then tried to angle the objective with a stone. Some days after he employed a large piece of stiff cardboard, a rose-branch, the brim of an old straw hat, and a piece of wire. All objects, especially of a long or oval shape, such as appear to be movable, become ‘sticks’ in the purely functional sense of ‘grasping-tool’ in these circumstances and tend in Koko’s hands to wander to the critical spot.”³⁴

³¹ *Id.* 275-276.

³² He tested chimpanzees in order to “gain knowledge of the nature of intelligent acts.” Wolfgang Köhler, *The Mentality of Apes [Intelligenzprüfungen an Menschenaffen]* (tr. 2nd rev. ed. Ella Winter 1925) 1.

³³ *Id.* 73.

³⁴ *Id.* 35.

Clearly here a behavioral manifestation of the Nietzsche-Darwin principle: “whatever exists, having somehow come into being, is again and again reinterpreted to new ends, taken over, transformed, and redirected by some power superior to it.”

Yet their wider deployment of the N-D principle is often prevented because the chimp is captivated, *benommen*, by what Köhler calls *die Optik der Situation*. Köhler’s entire approach to testing his animals was founded on assuring the surveyability of the problem-situation, on not hiding the ball from them but having all the elements of the, or some, solution visually present to the test subject:

“American animal psychology makes animals (or people) seek the way out of mazes, over the whole of which there is no general survey from any point inside; the first time they get out is, therefore, a matter of chance, and so, for these scientists, the chief question is how the experience gained in such circumstances can be applied in further tests. In intelligence tests of the nature of our roundabout-way experiments [*Umwegversuche*],³⁵ everything depends upon the situation being surveyable by the subject from the outset [*daß die Situation dem Prüfling offen gegeben ist*].”³⁶

Even so, with all the ingredients of solution in view, their problem-solving could snag on a ‘fixed idea.’ If a stick is needed to drag the food from beyond the bars to the chimp’s hand, and a small bushy tree is placed in the chimp’s cage, then to the human eye a source of sticks is obvious. The small tree is *Bestand*, ‘standing reserve’ for-using; to human being ultimately everything is *Bestand*. Yet for the chimp “the breaking off a branch from a *whole tree* . . . is an achievement over and above the simple use of a stick.”³⁷

Köhler places a small tree “consisting of three strong branches (without twigs) growing out of a thick trunk” at the very back of the cage, as far away as possible from the outside bars and thus from the food objective beyond the bars. Grande first seeks to seize a ‘stick’ by trying to pull an iron bar out of its attachment to the door of the room. She fails, and then tries a strip of cloth to reach the food, fails, and then tries a stone, and fails again. Again she goes for the iron bar but cannot dislodge it. Finally she goes to the tree and breaks off a branch, with which she “returns at once to the bars and attains her objective.” Köhler explains that “the black iron bar, although actually much more firmly attached to the door than are the branches of the tree [to

³⁵ “we do not speak of behavior as being intelligent [*einsichtig*], when human beings or animals attain their objective by a direct unquestionable route which clearly arises naturally out of their organization. But we tend to speak of ‘intelligence’ [*der Eindruck von Einsicht*] when, circumstances having blocked the obvious course, the human being or animal takes a roundabout path [*Umweg*], so meeting the situation. . . . All the experiments described in the following pages are of one and the same kind: the experimenter sets up a situation in which the direct path to the objective is blocked, but a roundabout way [*indirekten Weg*] left open. The animal is introduced into this situation, which can, potentially, be wholly surveyed [*völlig überschaubar*].” *The Mentality of Apes* 3-4.

³⁶ *Id.* 18. Cf. “The concept of perspicuous [surveyable, *übersichtlichen*] representation is of fundamental importance for us. It denotes the form of our representation, the way we see things.” Ludwig Wittgenstein, *Philosophical Occasions 1912-1951* (ed. James C. Klagge and Alfred Nordmann 1993) 133.

³⁷ *The Mentality of Apes* 104.

the trunk], yet stands out *visually* better from the wooden door, *as a separate object*, especially as one end is bent in from the door to the room. To ‘see’ a branch of the tree, so to speak, *as a stick*, [als Stock „loszusehen“] is much more difficult, and Grande did look at the tree twice, without this happening.”³⁸ The optics of the situation held her captive; for a while anyway.

Moreover:

“The results of [certain] experiments were later confirmed on all occasions when the crux of the situation was the removal of an obstacle. The chimpanzee has special difficulty in solving such problems; he often draws into a situation the strangest and most distant tools, and adopts the most peculiar methods, rather than remove a simple obstacle which could be displaced with perfect ease.”³⁹

The chimps’ view of the problem-situation as fixed obscured the solution. Their difficulty was in viewing the situation otherwise; we might say of varying it in the mind’s eye.

A principal aspect of difference – in degree not in kind – between chimpanzee and human is the latter’s greater ability to **produce** situational variants; that is, to operate on the totality, the situation, to produce a novel object, a novel view. As Heidegger puts it, to see “the ‘either/or’, the ‘both/and’, the ‘in such a way’ and the ‘otherwise’.” For Darwin the great puzzle was how organic variation arises. Variability ‘in general,’ *überhaupt*, originates with the human irruption into “the dimension of the possible in general.”

For Dasein the highest best use of **anything** is as variant-stock for taking-as-otherwise – *quocumque modo nos docet* – in world-building; whereby any ‘what-for,’ *Wozu*, is subject to redirection, repurposing, to a different *Wozu*. Another way of saying this is that no *Wozu* has *svabhāva*, self-nature. The view of something as having an inherent nature, fixedness, is an obstacle to taking it as *pratītyasamutpāda*, as dependently originated, and therefore subject to variation, to taking-as-otherwise. The capacity to take **everything** as varying and variable – as empty of *svabhāva* – is peculiar to the organism that is Dasein.

Dasein irrupts into the dimension of the possible in general: “Whatever we see could be other than it is. Whatever we can describe at all could be other than it is. There is no a priori order of things.”⁴⁰ The powerless (*ohnmächtige*, because we are unable not to exercise it) superpower (*Übermacht*) thus released is, however, in the blink of an eye destroying the conditions which make possible the irruption into the dimension of the possible in the first place: *peripeteia* at the macro scale.

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³⁸ *Id.* 105-106.

³⁹ *Id.* 65.

⁴⁰ Ludwig Wittgenstein, *Tractatus Logico-Philosophicus* (tr. D. F. Pears and B. F. McGuinness 1974) 5.634. *Alles, was wir sehen, könnte auch anders sein. Alles, was wir überhaupt beschrieben können, könnte auch anders sein. Es gibt keine Ordnung der Dinge a priori.*