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An ecology against the right. Learning uncertainty and humility from ecosystems

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An Ecology Against the Right

Learning Uncertainty and Humility from Ecosystems

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The social sciences and the natural sciences of the 19th century stimulated each other, and the theory of evolution gave birth not only to a Copernican revolution but also to a far-reaching misconception. The idea of the struggle for survival became a biological fundament of *völkisch*[1]. The findings of modern ecology are neither compatible with the simplistic principle of the "survival of the fittest"[2] nor with a balance in nature. Rather, it is the degree of cooperation and integration in a steadily growing network of life that can inspire a completely new image of functioning ecological and social systems.

It must be one of the most tragic aberrations of the history of ideas. The development of a naturalistic world view and of a concept of humankind**,** of all things, based on the theory of evolution, as a logical consequence of Enlightenment, has led to an anti-human ideology, to millionfold suffering and murder. It is precisely this further Copernican insult that tossed the perceived god-likes from their pedestal of superiority. As the last act of liberation of the modern European sciences, it was this central step towards secularization from the corset of the Christian religion that then seemingly delivered a justification for the greatest crimes against humanity, the Holocaust and National Socialist terror. The survival of the fittest and the struggle for survival in the evolution of the organisms became the model for *völkisch* ideology and racism. The ideology of Social Darwinism has still not vanished from our culture. Still, biologistic ideals continue to underpin "rightist" thinking. The Social Darwinist transfer of findings from biology onto society has thoroughly discredited the approach "of humankind learning from nature". All new attempts have to raise suspicion. Would it be possible for society to learn from the results of ecology without falling prey directly to a new form of unscientific and inacceptable biologism or ecologism?

Basically, it is to be expected that natural sciences are free of values and ideologies like the balance in nature and ecological occurrences. There was no good or evil in nature's unfolding

[1] The Oxford English Dictionary defines "völkisch" as "Designating an ethnocentric nationalist ideology in Germany in the late 19th and early 20th centuries, characterized by populism, anti-Semitism, and a belief in a mystical connection to the land; of, relating to, or advocating this ideology. Later also more generally: (of an ideology, its adherents, etc.) nationalist, populist, and (typically) racist." https://www.oed.com/dictionary/volkisch_adj?tab=meaning_and_use Last accessed 11 April 2024.

[2] "Survival of the fittest" has usually been translated into "*Überleben des Stärkeren*", however, "fittest" is "the best adapted", not, as the German term suggests, "the strongest", cf. Dellureficio, Anthony J. "H. G. Bronn, Ernst Haeckel, and the Origins of German Darwinism: A Study in Translation and Transformation. Transformations: Studies in the History of Science and Technology. by Sander Gliboff. Cambridge (Massachusetts): MIT Press. 2008." *The Quarterly Review of Biology*, 84, 2, 2009, 182-182.

before the species, as the actors of evolution could not anticipate, evaluate, and reflect on the consequences of their actions. Along with the evolution of humans, morals and ethics entered the planetary ecological stage. Since thought, feeling, and responsibility are part of this world, too. If we follow the ecological approach that arises logically from the findings of evolutionary science, humankind is part of the global ecosystem. In no way do humankind's intellectual properties place themselves above the rest of nature that created them. Of course, the delicate question arises whether we may or even should learn from an ecological system how to act as humans that enables and bears us with regards to nature and to our fellow human beings.

The key to learn appropriately from nature lies in the complexity and indeterminacy of the global ecosystem. An ecology against the (political) right means, most of all, that there are no secure and simplistic answers in nature.

From society to evolution and back: simple messages, disastrous misunderstandings

Volumes have been published on the interdisciplinary exchange of ideas between social sciences, biology, and anthropology that on the one hand led to the conception of evolutionary theory and ecology, but on the other hand created the consequential misunderstanding of Social Darwinism. Thomas Robert Malthus's *Essay on the Principle of Population* (Malthus 1789) on the potential problems of overpopulation, food shortages, and further catastrophes was transferred into the natural sciences by Charles Darwin and inspired him just like the "struggle for existence" led to the inspiration of British philosopher, biologist, and sociologist Herbert Spencer's (1820-1902) concept of selection as the driving force for biological evolution. This again, as a "natural law", seemed to substantiate that concept of Social Darwinism—which also actually could be referred to Social Spencerism, like the evolutionary biologist Ernst Mayr suggested (Mayr 1982). The presumed struggle for survival in nature, where only the fittest would be able to survive and propagate, became the legitimization for the suppression or even the eradication of the weaker—a keystone of national socialist ideologies of supremacy, expansion, and murder.

Darwin himself seemed to follow "Spencerism" to some extent when in 1871 (12 years after publishing his theory of evolution), he explained in his work about the evolution of humanity how human beings seemingly had overruled the law of selection for themselves, which lead to the propagation of the weaker:

> "With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilised men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of every one to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to small-pox. Thus the weak members of civilised societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. It is surprising how soon a want of care, or care wrongly directed, leads to the degeneration of a domestic race; but excepting in the case of man himself, hardly any one is so ignorant as to allow his worst animals to breed."[3]

[3] Darwin, Charles (1871): The Descent of Man and Selection in Relation to Sex. London, Murray. https://pure.mpg.de/rest/items/item_2309881_7/component/file_2309880/content Last accessed 11 April 2024.

He stops midway when he highlights the "Instinct of Sympathy" as the most noble part of our nature. But he mistakenly presents that we have to "bear without complaining the undoubtedly bad effects of the weak surviving and propagating their kind" (Darwin):

> "The aid which we feel impelled to give to the helpless is mainly an incidental result of the instinct of sympathy, which was originally acquired as part of the social instincts, but subsequently rendered, in the manner previously indicated, more tender and more widely diffused. Nor could we check our sympathy, if so urged by hard reason, without deterioration in the noblest part of our nature. The surgeon may harden himself whilst performing an operation, for he knows that he is acting for the good of his patient; but if we were intentionally to neglect the weak and helpless, it could only be for a contingent benefit, with a certain and great present evil. Hence we must bear without complaining the undoubtedly bad effects of the weak surviving and propagating their kind; but there appears to be at least one check in steady action, namely the weaker and inferior members of society not marrying so freely as the sound; and this check might be indefinitely increased, though this is more to be hoped for than expected, by the weak in body or mind refraining from marriage." (ibid.)

Charles Darwin too was a child of his own time and used his findings in the context of "Spencerism" for conclusions regarding the superiority of "races" and the Anglo-Saxon culture:

> "(...) and it is chiefly through their power that the civilised races have extended, and are now everywhere extending, their range, so as to take the place of the lower races. At the present day civilised nations are everywhere supplanting barbarous nations, excepting where the climate opposes a deadly barrier; and they succeed mainly, though not exclusively, through their arts, which are the products of the intellect. It is, therefore, highly probable that with mankind the intellectual faculties have been gradually perfected through natural selection; and this conclusion is sufficient for our purpose" (Darwin 1875).

The zoologist Ernst Haeckel (1834-1919) spread the theory of evolution in Germany. There, the idea of social Darwinism possibly fell on even more fertile ground than in England—at a time when all effort was made to install the young German national state into a geopolitically risky environment and to construct a supposed supremacy as a justification for belligerence. The artistically talented Haeckel approached evolution by depicting the diversity of biological forms. His illustrations of the foraminifera or radiolarians (see figure on next page; Haeckel 1862) are legendary. Sentences like "One could believe that in this enchanted coral grove, where each animal becomes a flower, the blissful peace of the Elysian Fields prevails" ('*Arabische Korallen*;' Hackel 1875, already quoted in *Jahrbuch Ökologie* in 2007, Gerd Weigmann) illustrate how Haeckel was inspired quite peacefully by nature's beauty.

The symmetry and beauty in nature—as in the case of the foraminifera—that humans can obviously perceive—(mis)leads intuitively to the concept of order and balance in nature. Without a doubt, evolution has encouraged our ability to quickly detect patterns and classifications of biological diversity. It allows the opportunistic Homo sapiens to tap into an immense diversity of food and to orient themselves even in incomprehensible ecosystems. It facilitates recognition of the expectable. Pattern recognition also renders orientation in a non-spatial sense. It supplies reassuring explanations where there might be none. The gift of detecting natural orders does not

prevent us from interpreting patterns, order, and balance where they do not exist. And it incites uncertainty or even rejection when we are confronted with perceived “chaos.” It is known from psychology that humans, for example, mostly find symmetrical faces prettier than asymmetric ones. Many prefer a tidy forest and the orderly park landscape to a “primeval forest.”

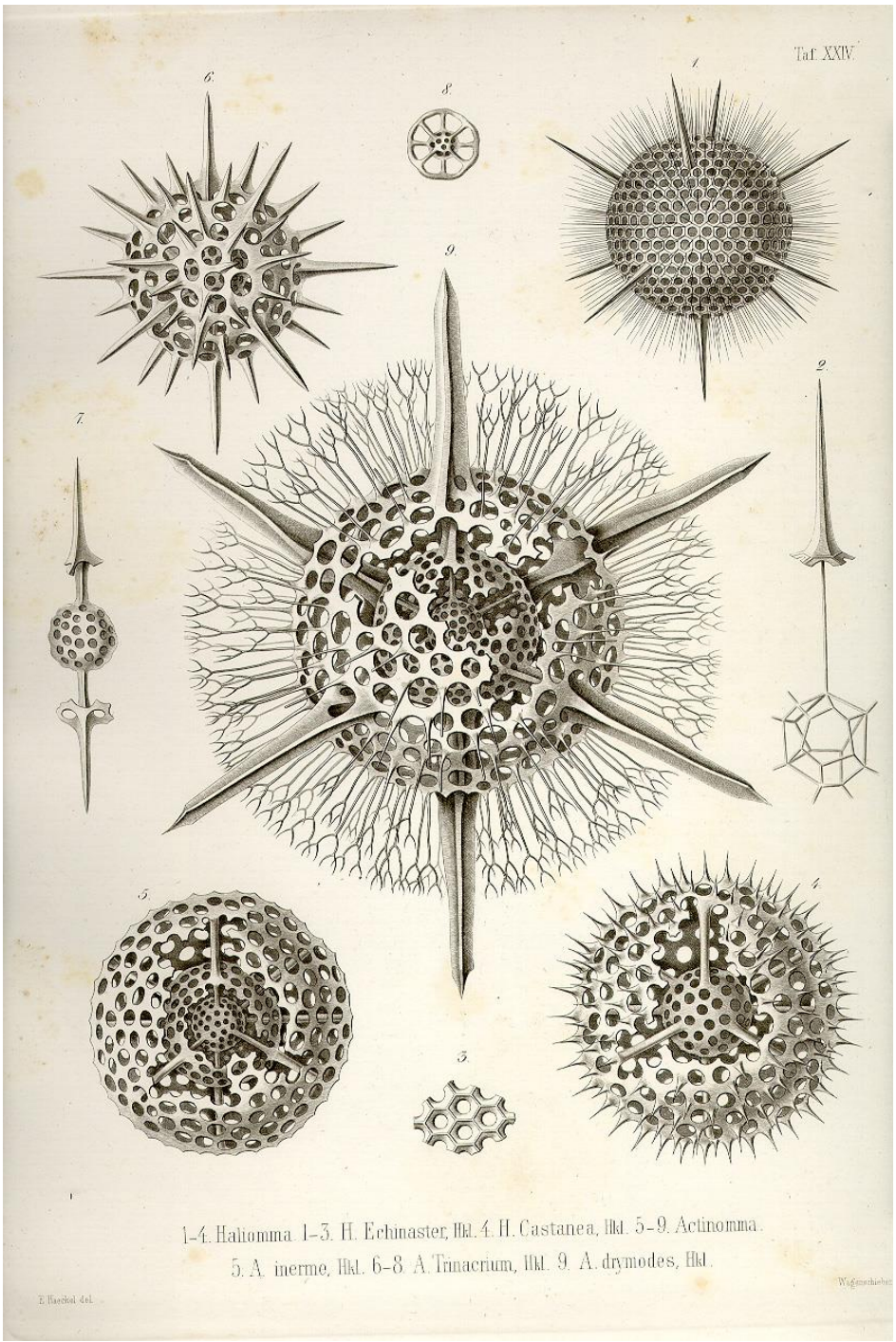

Table XXIV from Ernst Haeckel: The Radiolaria (Rhizopoda radiaria)”, Berlin 1862.

Many biological forms are shaped according to the construction of symmetry, which intuitively also stands for the "natural order" we expect**.** The zoologist Ernst Haeckel illustrated and classified the diversity of forms, engaged with animal morphology, pondered the function of the forms based on evolutionary theory, and ultimately became a forerunner of eugenics, which denied the right to exist to those e perceived as weak and those not meeting normative expectations.

It was an important epistemological step in biology not to merely describe the forms of the organisms but to connect them with functions. Haeckel must have been excited by the idea of evolution, as it offered a key in understanding the diversity of forms. His commitment to Darwin's evolutionary theory brought him the vilification as "ape professor;" he obtained letters with death threats.

Yet it was tragic that Haeckel, to whom pacificism was not unknown, was led from evolutionary theory to racist ideas that made him into one of the German pioneers of "race hygiene" and euthanasia. He did not only think about the unity of matter and spirit but also wrote—in his book "*Ewigkeit*"[4] in 1915–unambiguous lines like "A small dose of morphine or cyanide would not only liberate these deplorable creatures themselves, but also their relatives from the burden of a long, worthless, and agonizing life" (Haeckel 1915). Who could have imagined back then that the Germans would take measures two decades later and with an iniquitous meticulousness implement such crude ideas?

The purportedly corroborated scientific idea of the existence of superior *Völker* who gained both their power from the evolutive adaptation to the native and primal nature and the right to bluntly eradicate the seemingly weaker ones because they are superior. This became the ideological groundwork of the "right" that emerged from the national conservative milieu. That, just as purportedly, led to the necessity to separate and maintain ethnically pure communities in their homeland; the *völkisch* struggle to survive by exclusion of and combat against those that are different. The concept of "right" is to feel superior by birth or origin, to be content with one's own company and without any doubt taking the seat assigned in the "natural order", confidently, and on the basis of the perceived law of the stronger. The concept of "right" is also a world of power-bestowing simplicity.

Modern ecology: the end of the "ecological balance" and the "survival of the fittest"

Ernst Haeckel's deduction of "*Oecologie*" from Darwin's evolutionary theory was groundbreaking—and un-ideological. "As *Oecologie*, we understand the collective science of the relationships of the organism to the surrounding external world, where we can, in the farthest sense, calculate all "conditions of existence" (Haeckel 1866).

"Ecology" survived the ideological aberration of its creator and only much later became that discipline that described the clever term: the sciene of husbanding (in nature) The advancement of the biological and ecological sciences did not prevent all their terms from being used wrongly or being misunderstood. For many, ecology is still to this day a synonym for the well-known "ecological balance" in nature. The basis is an idea of order in nature that seems to have been established in all organisms' struggle for being. In this context, it is also worth remembering Herbert Spencer's idea of an "equilibrium" as evolution's goal, as it would show a process of constant perfection.

[4] *Ewigkeit*, Engl., eternity.

That idea of an ecological balance, however, fundamentally faltered in the 1960s through the Nobel prize winner Ilya Prigogine's works on thermodynamics and irreversible processes. The laws of physics and biology put together made it clear: There is no such equilibrium in nature in the sense of a balancing condition. A complex system of interacting subsystems has developed on Earth's surface over hundreds of millions of years, a system which, through a constant application of increasingly large amounts of energy, has successfully continued to distance itself from a "thermodynamic equilibrium." The physical work performed in this system leads to a continual growth of biomass. This quantitative and above all qualitative growth increases not only its ability to work and innovate within its own system, but also its ontic openness, i.e. the possible futures of the system. An inconvenient message: No, the physicists' thermodynamic equilibrium is not to be confused with a perfect ideal state.

Still, the idea of a natural, perfectly even balance would still be ideologically easier and more attractive to translate than concepts like thermodynamics and informational entropy, exergy, or inherent indeterminacy. But by now according to works by Eugene Odum, Crawford Holling, James Kay, Sven Erik Jørgensen and many others, modern ecology is simply no longer straightforward "teaching of eating and being eaten."

The concept of ecosystems as self-organizing, dynamically changing, open, and economic systems makes it plausible that they really do exist based on energy, matter, and the flow of information and do not merely portray human constructs of different arbitrary units of nature. But the fact is also that the progression of ecosystems theory still has not been received by many "ecologically working" scientists. It comes as no surprise that school teachings are still worshiping the idea of an ecological balance (e.g. from a lesson in biology: "Natural ecosystems stand in an ecological balance that renders all living beings a long-term continual existence and further development (…)" (*Protestant Oberschule Hochkirch* 2020). Classics in biology lessons, like predator and prey graphs based on snow hares and lynxes, are based on research from the first half of the last century.

Modern ecology shows how life is developing on the very narrow ridge between chaos and order, moving–open-endedly—on both progressive and regressive paths; through self-organization, the ecosystem creates more and more opportunities for life. The perception that there is seemingly a higher development within the conditions of evolution has, among other things, to do with life having developed a capacity to remember. Information about solutions developed in the past does not necessarily get lost (even when a single species becomes extinct) but is collectively saved both in the genome and in the interactions of the organisms. They create path dependencies, certain "blueprints" that cannot change arbitrarily.

The information in the ecosystem is recombined countlessly, with stronger connections and new utilizations. Some "biological wheels" have been "reinvented" repeatedly by life—as shown by the convergent evolution of certain adaptation strategies, such as the development of the shape of fish and whales, but key innovations, such as certain biochemical reaction pathways, have been maintained over millions of years and are shared correspondingly by a number of organisms.

It seems especially important that within the framework of evolution, certain solutions, functions, and assertive models do dominate, however, the ones that are perceived as less developed, "weaker", and less well adapted are by no means eliminated. Certain mutations and genotypes can, under specific circumstances that are less advantageous (such as altered conditions) lead to a substantial selection advantage. One such example is the initially highly problematic light human skin that proved to be convenient for the production of a vitamin when

advancing to the northern areas with lower light. Should—for whatever reasons—the high-energy radiation on the Earth's surface increase, the innovation of light skin would be put into question again.

The development of multicellular organisms linked to numerous selection advantages did not necessarily lead to their discontinuation. Even the primitive bacteria, the archaeans, are still around. And even while microorganisms do not shape the "face" of ecosystems, they still dominate the scene. They are able, e.g. as pathogens, to change the development of multicellular organisms abruptly into a different direction. The moment that living conditions become extreme in one place temporarily or permanently—e.g., after a volcanic eruption or after substantial climate changes—the supposedly simple strategies of the single-cell organisms are often the only ones that still function.

From the Darwinist competitive evolution of the individual to the holobiotic cooperation and integration

Life is a systemically escalating process that has been running so successfully for such a long time on our planet because it is precisely that the supposedly better "models" have not replaced and eliminated the old ones. Rather, the old and the "simpler", or the less complex ones have been brought along and accumulated—in continually strengthening networks that are integrated into a comprehensive network. The global ecosystem did not only "improve" over time by unlocking available energy sources or rare water and nutritious resources and making the working capacity of living systems flexible, but also developed the networking, organizing, and self-regulating abilities. Forests, e.g., create a part of the climate that the trees need, through the ecosystem function itself.

Even sensitive organisms can occur in regions with extreme climate if these organisms are protected from other inconveniences of extreme weather—like ferns sensitive to drought, or frogs in the shade of rain forest trees. What started with the passive exploitation of a present species through another species often became an intense symbiotic cooperation, expanding to double and multiple organisms. Lichens e.g., are obligate relationships between fungi and algae or bacteria. Actually, all multicellular organisms do not consist of one species, but of several. Cyanobacteria living in plant cells became chloroplasts that plants use to conduct photosynthesis. The mitochondria that are indispensable for energy metabolism in the cells of all multicellular organisms are "undigested" offspring of alpha proteobacteria. Who are we—and if so, how many? Well, at least we are not just a primate species but rather one double organism. If not even more: In the last one to two decades, it has become clear just how much multicellular organisms, like animals and plants, are not only populated but virtually permeated by countless microorganisms in a microbiome. Fungi residing within plants alone serve as functional structures for those plants and have a substantial impact on their development and ability to live. Obviously, evolution did not care which species could "crush" others best, but rather which species managed to live and cooperate with as many other ones as possible. The recombination, wiring, and fusion of old and simple solutions has led to innovation in multicellular organisms and ecosystems and established a higher functionality. Recent research has found that plants can develop drought resistance, disease defense, or even communication with each other through fungi that live inside them. The circuitry of individual trees and subterranean living fungi in the so-called mycorrhiza is of central importance to the function of forest ecosystems. Van der Heijden et al. (2015) summarized that plants receive up to 80% of the critical nutrients, nitrogen and phosphorus, from symbiotic fungi; according to estimates, there could be ca. 50,000 fungi

species that cohabitate in mycorrhizal relationships with ca. 250,000 plant species. Apparently, there are also intense signal exchanges and communication processes within the root fungal network's microbiome. In the end, growing integration leads to evolutionary success. When microorganisms cooperate with multicellular organisms like trees, the whole ecosystem becomes more resistant against disturbances—and that benefits not only the trees, but all other organisms living in and on or with them.

The new ecological findings concerning the integration of organisms in ecosystems question conventional views of the species concept, among others. There has long been talk of holobionts (e.g. Baedke 2020), whose evolution is not just a matter of the multicellular "host". It surely holds true that no organism can "rest" on their cooperation and co-workers. In the course of open-ended evolution that knows neither "good" nor "evil", and no "higher" or "better", there is constant experimentation and reconstruction, as new players are continuously integrated. The uncertainty in this interplay also results from nature being devoid of hierarchies. A microscopically small virus can alter an individual's fate just as much as an overpowering predator can. Or the fate could even be driven into a new direction by a mutation inside a cell.

When we take a look at a seemingly calm ecosystem, e.g. a forest, it is not in any biological balance. Rather, it is an ever-changing energetic structure under constant work where energy, materials, water, and information are transposing, mutations are occurring, new relationships between components are being tried out, total information is growing–and at any time a small change can have a large impact.

Openness and transmutability

One thermodynamic necessity of all systems is their openness. Ecosystems need high-quality energy that can be devalued in energy metabolism. There is no such thing as energy recycling—an unfortunate problem that our modern, energy intensive human society has to cope with. In addition, ecosystems are necessarily open for material input, e.g., water, and nutrients.
But new information is also integrated regularly. The inclusion of new players that change their habitable locations due to environmental transformations is a regular phenomenon. It is even a condition for the maturation and the growth of ecosystems. Without the immigration of new species, central Europe's tundra would not have become forested again after the ice age. The pioneer shrub and tree species like hazelnut, birch, or pine have not gone extinct during the reforestation but rather continue to play a role in the ecological framework that is becoming richer in species. This is especially true in the "repair" of ecosystems after a disturbance and in the course of natural succession. The idea that nature strives towards a climax or end point is just as outdated as the idea of ecological balance. Ecosystems simply continue to develop and grow open-endedly–despite the physical boundaries of growth. It is a qualitative growth of information and the integrated network. Currently, Earth's ecosystems might be exhibiting a biomass that already existed in earlier geological eras. But their information content and complexity are disproportionately greater.

The rather trivial and yet still exceedingly important realization of evolutionary and ecological sciences pertains to the fact that no solution is forever. In the framework of adaptive cycles, the ecosystem's complexity and functionality grows through constant rebuilding as well as through the collapse of frameworks and the subsequent reorganization. Ecosystems yield continual "creative destruction", as macroeconomist Joseph Schumpeter in his work "Capitalism, Socialism, and Democracy" (1942) expressed in a thoroughly biological way for economics:

> "The opening of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as U.S. Steel illustrate the same process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure from within (…)[N.B.:] Those revolutions are not strictly incessant; they occur in discrete rushes which are separated from each other by spans of comparative quiet. The process as a whole works incessantly however, in the sense that there always is either revolution or absorption of the results of revolution" (Schumpeter 1942).[5]

Something similar can be said about ecosystems. Through the release of system components, new possibilities for development in economic and ecological systems emerge. In this "panarchic" process, as described by the ecologist Crawford Holling (e.g., Gunderson and Holling 2001), the components do not necessarily disappear and by no means do they annihilate "weaker ones". Rather, the previously less dominant system components can obtain an important role during reorganization.

An phenomenon essential for the creative destruction in nature developed explicitly after the emergence of multicellular organisms in the course of evolution: the limited lifespan. The death of complex organisms is actively initiated at the latest after reaching a genetically fixed age, which is a basic condition for making room for genetically recombined, young organisms. In the case of very complex and intelligent systems like animals, the maturation of an individual comprises the accumulation of tested experiential knowledge. Especially in the case of socially living animals, such as human beings, the wisdom of the old is part of the survival strategy of the group–and thus also the stimulus for the development of our "instincts of sympathy" to benefit all members in the society, whether weak or strong.

Learning from ecosystems—a question of ideology?

There are fundamental mechanisms in the ecosystem that lead to diversity and the ability to change and adapt: preserving the old, permitting the new, and the adaptive restructuring through innovation and constant recombination. It is of central importance that the ecological knowledge accumulated in the genes and in the interaction of organisms also comprises the totality of all solutions for the use of resources, survival, and further development so that it is never certain of itself and never self-sufficient. The laws of physics—including the relentless laws of thermodynamics—as well as the complexity of interactions necessitates that there can be no balance and no climax in development within a somewhat unreliable environment. No crown of creation, no finale, perfection or superiority, no end of history. There may be powers ordering nature that came into existence in response to the problem of the "thermodynamic chaos". However, even they contribute to the complex global ecosystem that remains inherently surprising**.**

These findings render modern ecology decisively useless for many conservatives, who have pursued the invention and development of nature conservation useless. Ilya Prigogine, who shaped the modern concept of ecosystems, is the lead author of an article titled *The End of Certainty* (Prigogine and Stengers 1997).

Scientific progress: First the "divine order burst, now, the "natural order" and the "ecological balance" become untenable, too.

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[5] https://periferiaactiva.files.wordpress.com/2015/08/joseph-schumpeter-capitalism-socialism-and-democracy-2006.pdf, last accessed 11 April 2024

Now, what is the message? Can we learn about sustainability from ecosystems? Is the econic approach (Hobson and Ibisch 2012), a new biologist ideology that precisely renders this question inadmissible? Without a doubt, no generation is immune to adopting scientific concepts into the current world view. After all, with the bad experiences in the past, ample caution is needed.

Indeed, ecosystems thinking, i.e. the ecosystems approach, is accused of reductionist ecologism. Meinhardt Creydt (2019) writes in a contribution titled "Ecosystem-Thinking and Ecologism":

"Reductionism has changed its shape through ecosystems-thinking." The assumption, "Ecosystem-Thinking comprehends the forest as a network of diverse factors. The question is how the quantitative changes of one factor affects other factors. What are the positive and negative feedback, threshold levels, values, and tipping points? "The whole" seems to be coming into view, but only from a certain perspective. For instance, plants only count "with regards to their property as biomass producers". The factors of an ecosystem are relevant according to their function. Who or what fulfills them, is unimportant." (…) This form of ecosystems-thinking differs completely from an approach that was inherent to the "old nature and *Heimatschutz* movement"[6]. According to Trepl, 'Protection of nature for nature's sake or for the joy of flowers and butterflies is dismissed as romantic sentimentality,' and 'imperative to protect nature because its intactness (whatever that was supposed to mean) is the precondition for the survival of humans.' In support of this, Trepl continues: "To have proven this scientifically is the ecology's merit: Trepl states, that finally, with firm ground under one's feet, one could argue with facts instead of merely insisting on subjective wishes (quotations within the quotations from Trepl 1983).

It is noteworthy that here the "old nature and *Heimatschutzbewegung*" is contrasted with ecosystemic thinking. Apart from that, the criticism is based on the glaringly incomplete reception and improper reduction of modern ecology. Ecology is anything but trendy but has matured over decades into a more and more interdisciplinary and integrating science. The ecosystems approach does not focus solely on the function, and it is by no means incompatible with an emotional approach to or love of nature. What Creydt ultimately rejects implicitly is—regressing to simpler views of nature—the engagement with the complexity and functionality of ecosystems. Wolfgang Sachs's criticism of ecology is cited, too: "Systems thinking aims at controlling the secondary order, at the control of control. It is the epistemology for a preventative observation and a control of the exploitation of nature" (Sachs 1991). Witty wording, but still a huge misunderstanding (based on an incomplete knowledge of the ecosystems theory and empiricism?). Systems-thinking and ecosystem ecology teach, above all, that controlling complex systems is barely possible. Why then should the "controlling control" succeed and be intended at all anyway?

The ecosystemic view is by no means a part of a reductionist measurement of nature. On the contrary. It does not offer simple truths. Especially not truths that legitimize us as humans to elevate ourselves above nature, other living beings, or other humans. There is no biological-ecological justification to suppress, exclude, or murder. Ecology against the Right: There has been reason for humble astonishment about the complexities of nature that we humans still don't

[6] „*Heimatschutz*"cannot be translated as „Home defense" despite that literal meaning but refers to a rather loaded national concept of "home, homeland, and native region". For a more detailed analysis of the historical concept of Heimatschutz, *see* Bickle, Peter (2002). *Heimat: A Critical Theory of the German Idea of Homeland.* Canden House.

understand and underestimate after centuries of research. Scientific naturalism should not stand in our way as the third Humanist Manifesto shows for example (American Humanist Association 2003), which was also signed by Nobel Prize Winner Ilya Prigogine. One of the six principles of this manifesto is the statement: Humankind is an integral part of nature, the result of undirected evolutionary change (cf. contribution by Ibisch and Sommer to ecohumanism in this volume).

Even if there is no ecological balance, our wish for a life in "harmony with nature" is all too understandable and human. The strong culturally influenced ability to cooperate consciously, to self-reflect, and to exercise empathy and kindness is what distinguishes us most from other animals. If we could succeed in cultivating this ability further and strive for harmony with nature that persistently transcends our understanding, then we might possibly get somewhere… with a sustainable society.

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