The Well-Tempered Earthworm

On the Nature-Relationships of Digital Music

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(english translation by N. Andrew Walsh)

Imagine for a moment, dear readers, an enormous set of scales. In the one scale-pan is placed everything that lives on this planet: trees, fish, woodlice, elephants, and also us, the human inhabitants of the Earth. Our clothing, however, we must leave beforehand in the other scale-pan. For in this other one is gathered, namely, the entirety of the “anthropogenic mass” that is to be found on our planet. That is, everything that has been produced by human artifice: houses, streets, airplanes, nuclear power plants; plus all the small things that we carry on our persons, or what one finds in the last steps before the registers at an IKEA store. What do you think: which of the two scale-pans will sink lower?

The answer to this question is not wholly irrelevant. It may very well possibly be crucial for the survival of our species. For we are—and we often forget this—biological entities. Stated more precisely: members of the vertebrate sub-phylum in the class *Mammalia*. As such, however, we are dependent in an existential way on the ecological niche we call the Earth. And indeed in a much more fundamental way than on money or housing or musical instruments. At the present moment we are vertebrates confronted with a most acutely serious problem: our biological niche is threatening to topple over. A half-century prior one still thought that resource depletion and a resultant shortage of raw materials would be the reason for us one day reaching the “limits to growth.”[1] And yet in the interim we have come to realize that it will not be scarcity that is our greatest problem, but excess. For we not only plunder our niche: we build over it, lay asphalt across it, cultivate it, and bore tunnels underneath it. And we use it as a cesspit and waste dump for the excretions of our industrial metabolism.

Our planet is large and can take a lot. The technical term for the deposits provided by nature for our metabolism is “sink.” But at the moment quite a lot of these sinks are running up against the limits of their intake capacity—those for CO_2 (to give one example) that would in an intact biosphere normally be bound in many different ways: in the ground, in the moors, the waters, the forests, and the atmosphere. But our metabolic rate as a whole has taken on such monstrous proportions, that we are suffocating our own biological niche. To return to the riddle posed at the beginning: Israeli researchers have calculated, that the biomass was only recently, around the turn of the year 2020/2021, relegated to second place. For the first time in the history of our planet, it has now been surpassed by the mass of things made and used by humans.[2] A cæsura in geologic history—and an alarming signal. If we fail to

1 After the title of the report by the Club of Rome on the state of humankind in 1972 (Dennis Meadows et al, Potomac Associates, 1972).

2 See Emily Elhacham et al, “Global human-made mass exceeds all living biomass,” https://www.nature.com/articles/s41586-020-3010-5 (2021). The study is only concerned with such human-produced materials that are presently in use. If one also calculated trash and construction debris as well, then the turning point would have to be dated considerably earlier (see Reinhold Leinfelder, “Die menschengemachte Masse – Darf's ein bisschen mehr sein?” https://scilogs.spektrum.de/der-anthropozaeniker/die-menschengemachte-masse-darfs-ein-bisschen-mehr-sein/ (2021)).

reverse these developments as quickly as possible, life for us vertebrates will become very unpleasant indeed. For we require biomass to survive and within which to live. Because we ourselves are biomass. And yet rather than redistribute the burdens right away, we produce ever more things and simultaneously see to it that the biomass in the opposing scale-pan becomes ever lighter. *When* the scale finally tips over can only be predicted with the greatest difficulty.[3] It is nevertheless indisputable, that we find ourselves in the midst of a mass-extinction event: one that already now matches (and to a certain extent exceeds), in its speed and severity, that great mass-extinction event of approximately 65 million years ago to which the dinosaurs fell victim.[4] Our present crisis also has a cultural component. The conscious awareness of our own symbiotic dependence on that which we annihilate with all our might is limited. Instead we allow ourselves to be led by æsthetic predilections: if one enters the german term “Artenschutz” (species conservation) into google's image search, one finds droll koalas, gaudy birds, and a menagerie full of circus animals. To accept, that spiders, mosquitoes, and worms have the right to their own lives as well is more difficult for us. To understand how great their value is to us and our existence even more so. Yet the “silencing of nature,”[5] which we have been experiencing for several decades, does not merely mean that it's simply a regrettable thing, if there is less twittering to be heard in one's home garden, or when the heart-rending song of the Kaua'i 'O'o only exists on Youtube.[6] Rather, it means that we are irrevocably extinguishing ever more voices, pitches, and entire melodies from life's complex symphony and arbitrarily in their place are placing entirely other voices, pitches, and melodies, without ever having more than approximately understood the whole composition.

The “edaphon,” for example. What sounds like a rare form of tuba is in fact the technical term in biology for the sum total of soil biota. Actinotrichid mites, isopods, bristleworms—there don't seem to be any less-interesting and less-valuable contemporaries. They are a bit disgusting, we barely perceive them, and they are apparently excessive in number. Burrowing through a single handful of hummus are more microscopic animals than there are humans on this Earth, and in many regions of the world even just the earthworms would bring more biomass to the scale than would the mammals that live there.[7] Yet

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3 Similarly as with global warming, on account of the loss of biodiversity researchers have concluded that there is a tipping-point at which a destructive domino-effect will take place. The relationships are, however, too complex and too little studied to model them exactly in order to make any accurate predictions.

4 See in this regard, for example, Matthias Glaubrecht, “Das Ende der Evolution. Der Mensch und die Vernichtung der Arten,” Munich: Bertelsmann, 2019 as well as WWF, “Living Planet Report 2020. Bending the curve of biodiversity loss,” https://www.wwf.de/fileadmin/user_upload/living-planet-report/2020/Living-Planet-Report-2020-english-version.pdf (2020) and Thomas A. Neubauer, “Current extinction rate in European freshwater gastropods greatly exceeds that of the late Cretaceous mass extinction,” https://www.nature.com/articles/s43247-021-00167-x (2021).

5 Since the time of the Rachel Carson's classic *Silent Spring* (1962) is the motif of nature falling silent

6 See Meret Signer, “Hier singt ein ausgestorbener Vogel” [“Here sings an extinct bird”], https://www.tierwelt.ch/news/wildtiere/hier-singt-ein-ausgestorbener-vogel (2019).

7 See Otto Ehrmann, “Regenwürmer in den Böden Baden-Württembergs – Vorkommen, Gefährdung und Bedeutung für die Bodenfruchtbarkeit,” https://www.zobodat.at/pdf/Berichte-naturf-Ges-Freiburg-Br_105_0125-0176.pdf (2015) as well as Volker Hahn, “Lokale Regenwurm-Vielfalt in Europa größer als in den Tropen,” https://www.uni-jena.de/191024_Regenwurmvielfalt (2019), and HyperSoil (2004):

this mass is, similarly to the insects, birds, and sea-creatures, in the grips of contraction. More than a third of the earthworm species in Germany are on the "Red List" of extinct, endangered, or extremely rare animals; and it may reasonably be feared that rising temperatures will sharply accelerate these developments.[8] This would however be fatal. Earthworms, together with the other members of the Edaphon, have made up the *basso continuo* of life on Earth for millions of years. They plough, fertilize, and aerate the soil. They lay subterranean tunnel systems in the soil, which make possible the root-growth of plants, hold the water cycle to its course, and protect from soil erosion. They are a protein-rich source of sustenance for many other animals, protect soil and plants from mold infestation, and tirelessly produce verdant hummus that is not only the foundation of organic growth but is also an important sink for CO_2.[9] In short: earthworms and other soil organisms may count themselves as among our most important allies in the struggle against dying forests and desertification, floods and hunger, species loss, and the climate crisis. Yet instead of thankfully accepting this help, we humans are carrying out a veritable campaign of annihilation against them: in daily close-quarters combat with heavy harvest machinery and pesticides; in a sustained war of attrition through monocultures and sealing off the surface, and last of all a long-term and irreversible scorched-earth politics by means of intensifying global warming.[10] But because everything in otherwise healthy ecosystems is connected to everything else, such massive encroachments upon soil fauna have cascading consequences. Destroying the edaphon is one of many contributions to the collapse of entire ecosystems, which are thus lost not only as a habitat for thousands of living creatures and as a gene pool for future evolution, but also as natural CO_2 sinks: presently ever more forests and moors metamorphose at ever greater rates into CO_2 *emitters*, and contribute to the heating of the atmosphere rather than alleviating it.[11]

The good news in all of this: as primates of relatively advanced development we presently have available to us certain capabilities to shape events. Whether we bring them to bear on this inexorable chain reaction or not is for the moment not yet a question of natural laws, but of cultural ones. We can yet still choose how we behave relative to the natural world. We do not only just

"Lebewesen im Boden: Bodenorganismen," https://hypersoil.uni-muenster.de/0/06/03.htm, (2004).

8 See Helen Phillips et al., "Global distribution of earthworm diversity," https://science.sciencemag.org/content/366/6464/480 (2019) as well as BMU ["Bundesumweltministerium," the German Federal Environment Ministry] "Biodiversität im Boden. Antwort der Bundesregierung auf eine Kleine Anfrage der Fraktion Bündnis 90/Die Grünen," http://dipbt.bundestag.de/dip21/btd/19/091/1909179.pdf (2019).

9 See Ute Scheub and Stefan Schwarzer: *Die Humusrevolution. Wie wir den Boden heilen, das Klima retten und die Ernährungswende schaffen*. Munich: Oekom, 2017 and WWF, "Das Regenwurm-Manifest. Für lebendige Böden und einen funktionierenden Wasserhaushalt," https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/WWF-Regenwurm-Manifest.pdf (2016).

10 See Mailin Gaupp-Berghausen, "Glyphosate-based herbicides reduce the activity and reproduction of earthworms and lead to increased soil nutrient concentrations," https://www.nature.com/articles/srep12886 (2015) and Helen Phillips et al., "Global distribution of earthworm diversity," https://science.sciencemag.org/content/366/6464/480 (2019).

11 See Gregory Cooper et al., "Regime shifts occur disproportionately faster in larger ecosystems," https://www.nature.com/articles/s41467-020-15029-x (2020). German-language summary: Jan Dönges, "Große Ökosysteme kollabieren mit erhöhter Geschwindigkeit," https://www.spektrum.de/news/grosse-oekosysteme-kollabieren-mit-erhoehter-geschwindigkeit/1711748 (2020).

choose—we do so permanently, because we live in and from nature. Whether in our cultural norms of eating and living, or our travel habits: in all of our actions a relationship to nature is expressed. This fact cannot be escaped. Everything we do influences and changes nature. All that we do is shaped by the image that we make of nature. All that we model and instigate can influence and change the nature-relationships of others. And it is at this point that music comes into play.

Music as Expression of Nature-Relationships

Music that deals with nature or that seeks to express a nature-relationship has always existed: nature was glorified in song and the playing of instruments, beseeched, interpreted theologically, or invested with magical powers. Yet independently from such an ostensible and intended programmatics, music transports the nature-relationships of those who practice it and hear it to an entirely different level. “Connected to nature,” in a very literal sense, is first of all every kind of music, because the act of music-making always requires natural resources. In singing we use—according to a given musical culture in quite different ways—our own respiratory organs, vocal chords, and our body's own resonant volume. We bring differing degrees of mastery over nature to resonate in sympathy when we blow into animal horns, drum on stretched goat skin, or draw a bow of horse-hair across a gut string. And when we press even a single key of a church-organ we set a complexly condensed interaction of various materials into motion. But natural relationships are also expressed on the immaterial level of the accompanying discourses and narratives. To stay with the church-organ: for the great Baroque scholar Athanasius Kircher, it was not just simply a tool for producing sound, but was an allegory for the whole of Creation, the beauty and regularity of which it owed to the technical expertise of its divine master-builder. Examples such as this are many. Likewise, the system of musical harmony and disharmony, in the ancient Chinese musical culture as well as those in Asia Minor and the Mediterranean ancient world, was closely linked with an exegetical cosmology that may be traced through its many branching variants throughout music history. Music was regarded as a naturally or divinely provided intermediary of an eternal cosmic harmony and might thus exert healing or destructive influences on human beings. Such a cosmological relational frame functions in two directions: it conserves and transports a certain understanding of nature; it however also simultaneously defines the generally binding rules of æsthetics and taboos derived from it and bestows upon them a certain authority. Music is then not simply just “beautiful” or “less beautiful;” but rather it stands “harmonious with nature” or not, is perceived and described as either “organic” or “unnatural,” “pleasing to the god(s)” or “devilish.” Music can in this manner become a medium toward a relationship with nature, without itself dealing directly with nature. Sometimes this transpires subliminally and unintentionally, sometimes however entirely consciously, with instructional, revelatory, or manipulative intent. From time to time music becomes an instrument of oppression and political power, intended to secure and implement an ideologically motivated concept of nature. Deviations are then denounced as “primitive,” “against nature,” or “degenerate,” and thereby at the least renounced as valueless (if not as something that must even be actively suppressed).

For New Music in the 20th century, the critical confrontation with such ideologies of natural law play an enormously important, almost constitutive

role. Needing to defend one's own artistic autonomy and drive for progress against authoritarian and reactionary conceptualizations of naturalness was a historically formative and strongly binding collective experience. Where musical experiment was paired with technological innovations, the accusation of deficient naturalness was not long to follow. Hindemith's first “original works for record players” were criticized as a “joke of the laboratory”;[12] the electronic music of the postwar period was regarded by religious circles as an “act against Creation,” which could (they claimed) contribute “to a deep-structure injury to Man.”[13] “Ought it be permitted,” asks the musicologist Friedrich Blume, publisher of the encyclopedia *Die Musik in Geschichte und Gegenwart*,[14] in 1960, “that we take the axe to the roots of one of God's most perfect creations, in order to build a grotesque world out of its ruins that apes its creator? Is that not presumption? Does that not touch on blasphemy? It may well be the case, that this waveform-generation is something that reflects our present age of atomic disintegration and full automation. This fully denatured product has … nothing more to do, however … with music.”[15]

I am aware that I bechance a plunge into murky and prejudiced waters when I inquire into the relationships with nature in digital music. In order to obviate misunderstandings it should be clearly stated at this juncture: I am not here concerned with the conservative cultural struggles of the last century, and certainly not with denying any music its *raison d'être* on aesthetic grounds. Rather, I am concerned with those new and urgent questions that in the 21st century can no longer be avoided: what if our relationship to nature as a whole has become dysfunctional and self-destructive? What does it mean for the music of our present, that it sounds into and out of a world threatened by mass species extinction and an irreversible tipping-point of the climate? What role should it play, what kind of relationship to nature ought it transmit? And what relationship to nature actually speaks from it?

Digital Music as Global Monoculture

“The” music of the present—that seems at first glance to be a contradiction in itself. Music is stylistically, formally, and philosophically far too broadly expansive, that one could speak of it with a single over-arching singular. Yet precisely in the face of this multiplicity (and in historical comparison even more so), the nature-relationship expressed in music of the present is astonishingly uniform. For this relationship is, independent of any programmatic intentions, decisively characterized by a commonality that unites large parts of contemporary music across all stylistic and genre boundaries: the use of digital

12 The music critic Walter Abendroth, cited in Peter Donhauser, *Elektrische Klangmaschinen. Die Pionierzeit in Deutschland und Österreich*. Vienna: Böhlau, 2007, 73.

13 Hofmann 1964, cited in Christa Kirschbaum, *Singen in der Gemeinde. Darstellung und Vergleich dreier Konzeptionen zum Gemeindesingen in der Evangelischen Kirche in Deutschland*, unpublished graduation thesis, Essen 1986, 41.

14 [“Music in History and the Present.” The central reference work on Western music in the German language. -Ed.]

15 [In German: “Ist es statthaft … daß wir die Axt an die Wurzel einer der vollkommensten Schöpfungen Gottes legen, um dann aus den Trümmern eine Fratzenwelt aufzubauen, die den Schöpfer äfft? Ist das nicht Vermessenheit? Streift es nicht an Blasphemie? Es mag wohl sein, daß diese nur durch Apparate produzierbare und reproduzierbare Schallgeneration etwas ist, was unser Zeitalter der Atomzertrümmerung und der Vollautomation spiegelt. Mit Musik aber … hat dieses volldenaturierte Produkt … nichts mehr zu tun.”] Friedrich Blume 1960, cited in Winfried Kurzschenkel, *Die theologische Bestimmung der Musik. Neuere Beiträge zur Deutung und Wertung des Musizierens im christlichen Leben*, Trier: Paulinus-Verlag, 1971, 594.

components. That does not mean, of course, that there wouldn't be any exceptions: individual styles or the remnants of regional cultures, in which a nature-relationship is quite explicitly cultivated and practiced, which deviate from the mainstream. And it certainly does not mean to say, that the whole of the music of the present is completely digitalized through and through. But you would find only very little music left that makes a claim to artistic or pop-cultural relevance *without* carrying out at least some part of its existence, on some level of its production, its propagation, or its reception digitally. Even in those domains in which the analog was still widely dominant until only recently (for example, in early musical education or in small-town singing traditions), the great digitalization-boom as a consequence of the Corona-pandemic has weakened the last boundaries.

If I should cast a critical eye in this essay upon the hegemony of the digital, it should not be taken to mean that I wish to regard or even sweepingly vilify digitalization *per se* as "unsustainable." Without powerful computers there would be no climate modeling; without social media no "Fridays for Future." Digital technologies can in many cases make valuable contributions to our transition to sustainability.[16] This is also true for music as well. If Markus Maeder renders audible the desiccation stress of dehydrated trees or the vitality of soil, and issues an invitation to a nationwide citizen-science project to emulate him; if Christina Kubisch with her "electrical walks" makes the omnipresence of electrical fields sensually experienceable; if Erwin Stache invites you to save energy by means of a "sound-staircase" or subtly links biological species extinction to technological obsolescence; then all these are unquestionably magnificent, harmonious, and enriching concepts.[17] My mistrust is not directed toward such individual works; but rather toward the matter-of-factness and lack of criticism with which the creeping and comprehensive digitization of music is being pushed forward and accepted. Is it really a victory if the "digital" is also "the new normal" in music? Is it really justifiable, that technologically based forms of music assert a kind of claim for themselves to the right of sole representation of the Progressive, while purely analog forms of music-making are made to struggle with an ever-more-present image of backwardness and dowdiness? Is it justifiable that terms such as "experiment," "laboratory," "research," or "interdisciplinarity" are almost always linked in our music institutions with new technologies? It seems to me, that all too many hopes and promises of salvation, positive earnings outlooks, corporate interests, research funds, and cultural underwriting have been heaped into the scale-pan of digitalization. This one-sided supremacy requires a counterweight and has

16 The Research Council of the Federal Government [of Germany] for Global Environmental Change names here, among others: precision agriculture, the monitoring of ecosystems and biodiversity, the support for solidary lifestyles, as well as a collective global consciousness for sustainable development. (see WBGU, *Unsere gemeinsame digitale Zukunft*, Berlin 2019, 160-286).

17 For Markus Maeder's works see Lukas Denzler, *Sounding Soil. Die Musik der Böden*, https://zett.zhdk.ch/2019/02/20/sounding-soil-die-musik-der-boeden/ (2019). For the Electrical Walks by Christina Kubisch see Marion Saxer, "O-Ton-Rauschen. Der Wald in der akustischen Kunst und Klangkunst der Moderne," in: Ute Jung-Kaiser (Ed.), *Der Wald als romantischerTopos. 5. Interdisziplinäres Symposion der Hochschule für Musik und Darstellende Kunst Frankfurt am Main*, Bern: Peter Lang, 2007, 269-282. For Erwin Stache's projects "Ludwig nimmt die Treppe" und "Arten Sterben" see Henning Hübert, "Künstler lässt Treppe erklingen," https://www.deutschlandfunkkultur.de/experiment-ludwig-nimmt-die-treppe-kuenstler-laesst-treppe.2165.de.html?dram:article_id=338202 (2015) as well as Erwin Stache, "Arten Sterben." http://www.erwin-stache.de/Start/Objekte/M_S/MagAug/_19ArtenSt/Artensterben.htm (2019).

earned itself, like all hegemonies, a closer look.

Such a critical scrutinizing should not be mistaken for a romanticist transfiguration of the past. We know with absolute certainty that not all was better in the past and it is without question that digitalization has bestowed upon music a tremendous gain in new creative possibilities. Yet this limitless feasibility of creating has its price. On even the most sober reflection, it will be possible to say about the former analog music that it was often interrelated with its immediate geographical, climatic, and ecological environment. In the traditional music-forms of the Greenland Inuit, Arabic Bedouins, or alpine mountain-peoples it is not some arbitrarily invented construct of nature that is expressed, but rather it is related to just those living conditions and created out of just those resources that are available in those regions. One could dismiss this great diversity of regionally formed and lived music styles as irrelevant, as their reach is limited and they can only with difficulty be linked to urbane discourses and lifestyles. One could also regard them as an immensely valuable store of knowledge—and this not only in an æsthetic for socio-cultural sense, but also because a great richness of different relationships between humans and nature are deposited in them. A metastudy by the United Nations, using the example of Latin America, has recently confirmed once again what environmental protection organizations have already long known: indigenous knowledge is enormously important for protecting the climate and species. Forest regions under indigenous custodianship are verifiably less-intensely clearcut, suffer fewer extinctions of species, and absorb more CO_2 than other forest regions. “Indigenous and tribal peoples’ territories,” according to this report, “are spaces for the production and reproduction of their systems of communal living, for exercising their freedom, and for manifesting their cultures, spiritual beliefs, and ancestral knowledge. They share their territorial spaces with other living beings, with whom they maintain a direct relationship, where each guarantees the sustainability of the other.”[18] Indigenous music—maligned by us Europeans as “primitive”—is a part of this communal living and the knowledge-transfer from one generation to the next that forms the basis of it. It thus simultaneously becomes a medium for a provident and preserving relationship with nature. Yet this store of knowledge threatens gradually to run dry. For over a century already ethnomusicology has documented the progressive disappearance of indigenous music-cultures. And we can observe in the present, in real time, how intensely this development is once again accelerating. Not just digitalization is responsible for this. The climatic and ecological changes will likely also lead, sooner or later, to yet many more indigenous music-cultures (for example through unbearable heating or rising sea-levels) losing their ancestral native habitats.[19]

What remains is their digital archiving. At a first glance the cultural extinction of species seems to have been even somewhat ameliorated thereby. Many traditional melodies, songs, and instrumental techniques would have long ago vanished, had they not been archived digitally. Yet this is only half the truth: for the great richness of traditional and lived natural relationships expressed in this musical diversity cannot even be digitally stored. The reason: digital practices are everything but neutral concerning their relationship to nature. They convey

18 FAO/FILAC, “Forest governance by indigenous and tribal peoples. An opportunity for climate action in Latin America and the Caribbean,” https://burness.com/assets/pdf_files/fao-filac-final-report-en.pdf (2021), 99.

19 See Christine Dettmann, Gerrit Lohmann, and Bernhard König, “Bedrohte Musikkulturen,” https://www.youtube.com/watch?v=3QJU1B6ElyY (2020).

their own, specific ideology of nature, which inevitably rubs off on its æsthetic content. The more the Digital is established as the new normality, the more it impoverishes the former richness of regional human-nature relationships. Instead, a global monoculture of musical relationship to nature is increasingly taking hold, the spread of which began insidiously and has accelerated considerably in recent months due to the pandemic. Around the globe the same apparatus, the same paths of distribution, the same technologies are used for music-making and music-listening. We purchase the creative freedom and networking possibilities it enables with the largely uncritical acceptance of a highly problematic and globally standardized understanding of nature, which can be described with three terms: Decoupling, externalization, and appropriation.

Digital Music as Decoupling from Nature

Digital music enables unlimited control over the sounding at every level. Music has largely decoupled itself thereby from the previous limitations and natural foundations of their generation and reception. The “natural” gamut of tones of a music-instrument is no more a limiting factor in the path of a musical desire to create than are any corporeal limits of fluency, breathing volume, or dynamic differentiation.

But music has not only liberated itself from the limits of the physically or biologically feasible, but in a much more far-reaching sense from the deficiencies and shortcomings of everyday life. Among these may be counted, for example, the overcoming of economic constraints or eliminating the need for lengthy negotiation processes with intermediary bodies such as publishers or radio editorial offices. Among these may also be counted, however, a historically unique liberation from external constrictions and encroachments. Analog music was a music *limited by nature* through and through. It was not only bound by predetermined gamut of tones or characteristics of resonance. It also existed in an otherwise permanent state of unavailability, vulnerability to error, and imperfection, because it needed to be realized in real spaces by real people of flesh and blood. In the aggregate state of the Digital, on the other hand, sonic spaces can be created with a balance, brilliance, and acoustic freedom from interference that no architect could ever build. Digital music is able to balance complex sound structures to a degree that would never be possible for the sluggish human ear under real-world acoustic conditions: merging its individual components in a controlled manner, focusing them precisely, or separating them sharply, as desired. In its reception, digital music has likewise decoupled itself from time and space: in the interplay of streaming, universal WiFi coverage, and mobile devices it is itself available in almost any location. But we listeners can also use those devices at any time autonomously to enter a state of acoustic isolation and undisturbedness that seems normal to us now, but in fact has only existed since the first mass-produced Walkman appeared on the market in 1979.

Last but not least, digital music is able to achieve a degree of technical perfection that could only be dreamt of in the analog era. Music without error—that was originally a religious concept. Those monastic orders that sang strove for musical impeccability in lifelong religious exercises. Later, secular choirs, orchestras, and virtuosi set this for themselves as a goal, without being able to attain it. Thanks to digitalization the Utopia of yesteryear has become normality. As the musicologist Christiane Tewinkel searched for classical-music

CDs with audible errors on the occasion of a seminar on “Cultural History of the Musical Error,” she found that they don't exist. Nobody would bring a recording to market in which a squeak or a glitch can be heard.[20] Those who might perceive the digital flawlessness as “unnatural” can specifically attenuate or deliberately overemphasize it: the audible inhalation of a choir can be cut out with pinpoint accuracy. It can, however, also remain a part of the recording or even become a central element of the artistic design. The cold perfection of an artificially generated percussion track can be a stylistically characteristic feature; it can also however approximate by means of imprecision-algorithms back toward the imperfection of a real performer. What has long been common for the percussion tracks of synth-pop[21] can of course also be transferred to all other levels of music: every aspect of the production process or its sounding results can be selectively programmed as absolute perfection or also a piece of controlled unplannability and inexactitude.

Taking this all together, we can say in summary: digital music conveys on the level of its material the cultural image of a total subjugation, controllability, and the artisanal irrelevance of nature. “Naturalness” has been tranformed into a designable parameter. As an immutable and determining precondition, as an unwanted impairment or insurmountable limitation of music-making, on the other hand, its sun has set. Music has set itself up in a self-sufficient, trouble-free, and flawless counter-world, completely decoupled from the shortcomings of nature and life. The interplay of the various digital components enables every producer and every recipient unlimited freedom of choice, unlimited creative autonomy, and unlimited availability. At the same time, this also seems to redeem an ideal toward which bourgeois concert culture was already striving in the 19th century,[22] without being able to come even close to fulfilling at that time: to render possible for music a completely disembodied form of existence in which it emancipated itself from everything bound to nature. It seems as if music has never been as immaterial as it is today. But exactly this would be a grievous error.

Digital Music as Externalized Metabolism

Linguistic imageries can be treacherous. This also applies to the image of the scales with which I opened this text. The belief that music has somehow become “more immaterial” through its digitalization is imprinted by an especially treacherous imaginary set of scales, which could look, for example, as follows: in the one scale-pan are two thin, small devices—the laptop of a composer and the smartphone of one of her audience. In the second scale-pan, on the other hand, are piled up all those things that in the analog era needed to be built, printed, purchased, managed, and transported, so that the musical

20 See Andi Hörmann, “Ode an den Fehler. Über den Reiz musikalischer Unschärfen,” https://www.deutschlandfunkkultur.de/ode-an-den-fehler-uber-den-reiz-musikalischer-unscharfen-pdf.media.4e3906b44dc9ad6d28f794f7613bbb90.pdf (2015).

21 See Martin Dostál, “Genetic algorithms as a model of musical creativity: On generating of a human-like rhythmic accompaniment,” https://cai.type.sk/content/2005/3/genetic-algorithms-as-a-model-of-musical-creativity-on-generating-of-a-human-like-rhythmic-accompaniment/1504.pdf (2005), 332.

22 The emancipation of music from its corporeal, affective, and “primitive” effects was an important motif in the musical philosophy of the [German] Enlightenment. For Christian Friedrich Michaelis, Eduard Hanslich, and other prophets of the æsthetics of the autonomous artistic work, music should, as an expression of “tonally moving forms,” reflect human “greatness and sublimity.”

ideas of the composer might reach the ears of her listener: piles of music-instruments, mountains of staff-paper, perhaps additionally printers, publishing-houses, tour-buses, equipment, stage-pedestals, and concert-houses along with the adjacent parking deck. An immense pile of environmentally damaging anthropogenic junk.

You will already suspect that something in this image isn't quite right. But it is precisely this crude oversimplification that underlies the claims that digital culture counts as “intangible cultural heritage”[23] or that the digitization of music has contributed to a “de-institutionalization”[24] of artistic production processes. The opposite is the case: the production of music today is more material-dependent, more institutionally intertwined, and thus at the same time also more harmful to nature than it has ever been—and in the digitalization scale-pan it looks nowhere near as elegant and tidy as it might have appeared at first glance. The devices we all use every day already contain much more anthropogenic mass than they appear to. I was unable to find current figures on the “true weight” of a smartphone of the latest generation, but past figures speak for themselves: in 2004, 75 times the weight of raw materials needed to be used to manufacture a single desktop PC with a screen.[25] The ecological backpack of a brand-new cell phone from 2013 already had 937 times the weight of the device.[26] In addition to the usual chemicals, metals, and fossil fuels that are also found in conventional industrial products, the scale-pan of digital end-devices also contain numerous other raw materials that are considered “critical” in several respects—ecologically, politically and in terms of human rights.[27] For example, there is the light metal lithium, the mining of which on the three-country border between Bolivia, Chile, and Argentina is destroying the natural environment, poisoning the groundwater, and threatening the livelihoods of indigenous peoples.[28] There are the so-called “rare earths,” the particularly rich occurrence of which in the Arctic makes one

23 See Nana Brink, “Digitale Kunst soll Weltkulturerbe werden.” Deutschlandfunk Kultur, https://www.deutschlandfunkkultur.de/demoszene-stellt-unesco-antrag-digitale-kunst-soll.2156.de.html?dram:article_id=475554 (2020).

24 See Harry Lehmann, *Die digitale Revolution der Musik. Eine Musikphilosophie*. Mainz: Schott, 2012, 77ff.

25 1.8 [metric] tons of raw materials were used for the manufacture of a 24kg computer. See United Nations University, “Study tallies environmental cost of computer boom,” https://archive.unu.edu/update/archive/issue31_5.htm (2004).

26 In this example, 75kg of raw materials were required for a single 80g lightweight mobile-phone (not a smartphone!). See Wuppertal Institut für Klima, Umwelt, Energie, “18 Factsheets zum Thema Mobiltelefone und Nachhaltigkeit,” https://wupperinst.org/uploads/tx_wupperinst/Mobiltelefone_Factsheets.pdf (2013). The calculation is based on the MIPS formula (material input per service unit) also developed by the Wuppertal Climate Institute (see Michael Ritthof et al., “MIPS berechnen. Ressourcenproduktivität von Produkten und Dienstleistungen,” https://epub.wupperinst.org/frontdoor/deliver/index/docId/1533/file/WS27.pdf, 2002).

27 See Thomas Graedel et al., “Criticality of metals and metalloids,” https://www.pnas.org/content/112/14/4257 (2015) as well as Donata Riedel, “Der Rohstoffhunger der Digitalwirtschaft wird zum Problem,” https://www.handelsblatt.com/politik/deutschland/rohstoffkongress-der-rohstoffhunger-der-digitalwirtschaft-wird-zum-problem/22764402.html (2018 [expired link]) and TÜV Nord, “Die fünf Rohstoffe der digitalen Welt,” https://www.tuev-nord.de/explore/de/die-fuenf-rohstoffe-der-digitalen-welt/ (2020).

28 See Amnesty International, “Amnesty International Report 2020/21. Zur weltweiten Lage der Menschenrechte,” https://www.amnesty.de/sites/default/files/2021-04/Amnesty-Report-2020-Broschuere-Kapitel-auf-Deutsch-April-2021.pdf (2021) and Susanne Götze, “Kehrseite der Energiewende,” https://www.deutschlandfunk.de/lithium-abbau-in-suedamerika-kehrseite-der-energiewende.724.de.html?dram:article_id=447604 (2019).

of the last untouched landscapes on earth a contested hunting grounds for lucrative spoils in the global hunger for raw materials.[29] And then there is the no-less-coveted cobalt, which is mined in the Democratic Republic of Congo by children and adults under miserable and life-threatening working-conditions from small private mines and huge tailings piles.[30] But of course, these end-devices are just the tip of the digital iceberg. "A cloud," writes social psychologist Harald Welzer, "is imagined to be amorphous and disembodied, but it is nothing more than a very tangible server farm and is made of concrete, steel, sheet metal, glass, plastic, screws, toilet seats, and so on."[31] These server-farms already consume an immense amount of energy—and the trend is rising.[32] And this energy is by no means only "green": in order to be secured against power failures, the data centers require additional emergency power generators, which are operated with huge diesel engines and are regularly checked by test runs. "The Internet stinks," is therefore the headline in a daily newspaper that is not normally conspicuous for its exaggerated criticism of capitalism. At the heart of Internet culture, it smells "like a highway parking lot at night, where trucks park with the engine running."[33] In short, digital music is anything but immaterial. Its production is dirty and polluting. Every piece of digital art, every video uploaded, makes a small contribution to the transformation of living biomass into dead or toxic matter. And the mass digital reception of music is just as much a part of our self-destructive global metabolism as the use of disposable plastic or shopping trips by private car.

This does not mean that destruction of nature for the sake of music is something completely new. It already existed in the analog era and was connected in many ways with colonial exploitation and cultural expansion. Piano keys used to be covered with ivory, shellac records were made from the resin of the Asian lacquer scale insect, and rare tropical woods were and still are used in stringed instruments. But the digital era has catapulted the energy and environmental consumption of music into completely new dimensions. There are several reasons for this. One of them is the rapid acceleration of innovation cycles, which not only fuels the demand for raw materials but also causes the global electronic waste-pile to grow ever faster.[34] A record could be played for decades, a violin for centuries. The instruments of the digital end-devices of our musical mass consumption are discarded every year as

29 See Dietmar Pieper, "Machtkampf mit dem Eisbrecher," https://www.spiegel.de/politik/ausland/klimawandel-wettlauf-um-erdgas-oel-und-seltene-erden-in-der-arktis-a-1274371.html (2019) and Sara Moraca, "Der Kampf um Grönlands Bodenschätze," https://www.dw.com/de/der-kampf-um-grönlands-bodenschätze/a-57145542 (2021).

30 See René Gräber, "Kinderarbeit beim Kobaltabbau im Kongo für Smartphones und E-Autos," https://www.lost-children.de/kinderarbeit-beim-kobaltabbau-im-kongo/ (2021).

31 Harald Welzer, *Die smarte Diktatur. Der Angriff auf unsere Freiheit.* Frankfurt am Main: Fischer, 2016, 66f.

32 Andreas Schneider, "So viel Energie verbraucht das Internet," https://www.quarks.de/technik/energie/so-viel-energie-verbraucht-das-internet/ (2019).

33 Niklas Maak, "Auch das Internet hat einen Auspuff," https://zeitung.faz.net/faz/feuilleton/2018-01-13/auch-das-internet-hat-einen-auspuff/102139.html (2018).

34 Vanessa Forti et al., "The Global E-waste Monitor 2020. Quantities, flows, and the circular economy potential." United Nations University, http://ewastemonitor.info/wp-content/uploads/2020/12/GEM_2020_def_dec_2020-1.pdf (2020), 13. Summarized in German in: BR Wissen, "Globaler E-Waste-Monitor 2020: Viel mehr Elektroschrott weltweit," https://www.br.de/nachrichten/wissen/globaler-e-waste-monitor-2020-viel-mehr-elektroschrott-weltweit,S3ZvJab (2020).

electronic waste and mostly dumped in pits.

The amount of energy expenditure to consume music has also grown enormously. In general, researchers are now coming to the conclusion that energy consumption has increased overall as a result of digitization and has not decreased as originally hoped.[35] In the case of music it is probably, above all, its comprehensive, historically unique availability that drives up energy consumption. Precisely because we no longer carry music around with us in the form of physical sound-carriers and it has instead become obscenely normal to be able to call it up at any time and anywhere, an insane amount of energy has to be expended. As a child, I once heard an anecdote about a nobleman who had his court kitchen cook eggs for him every minute, just so that he could return home from the hunt to find a perfectly cooked egg waiting on his arrival. Digitization puts 3.5 billion smartphone users in the role of this prodigal nobleman—in relation to the totality of all music. “Streaming” means nothing other than that all existing music is constantly simmering away under a permanent supply of energy and is made available for immediate consumption by anyone who can afford a digital device. Considering the dizzying dimensions of this monumental madness (in 2019, videos with a total playing time of more than 500 hours were uploaded to YouTube every minute),[36] it's no wonder that Norwegian musicologist Kyle Devine, after meticulous research and calculations, has come to the conclusion that streaming is by far the most environmentally and climate-damaging form of music preservation ever seen.[37]

One of the recipes for success of digitalization is that it makes all of this invisible. The scale-pan in which our slim, shiny notebook lies remains clean because server farms and toxic electronic waste don't even get on the scales. They are far away, outside our perception. Digital music thus becomes the perfect soundtrack for what sociologist Stephan Lessenich calls the “externalization society.” His diagnosis: “We do not live beyond our means. … We live beyond the means of *others*.”[38] In his book titled [translated from the original German] “Alongside Us, the Deluge,” Lessenich illustrates this statement with the production of soybeans, palm oil, and cotton (among other things).[39] But this is equally applicable to the pretended immateriality of sampling and streaming. Digital music is also a piece of “enjoyment of wealth at the expense of others”[40] that outsources the costs and burdens of our progress and shifts them “into the beyond of social perception.”[41] The control and decoupling of nature described in the previous section thus becomes a mere simulation. Digital music brings with it not less, but much more dirt, disruption, and consumption of nature than analog music. But for these ugly sides of digital music, and for all the actual work and energy that has gone into it elsewhere in the world, the same that Harald Welzer writes about the elegant design of the Apple iPhones—it remains “invisible and also *should* be invisible”—

35 Steffen Lange et al., “Digitalization and energy consumption. Does ICT reduce energy demand?,” http://www.santarius.de/wp-content/uploads/2020/08/Digitalization-and-energy-consumption-Ecological-Economics-LangePohlSantarius-2020.pdf (2020).

36 See James Hale, “More Than 500 Hours Of Content Are Now Being Uploaded To YouTube Every Minute,” https://www.tubefilter.com/2019/05/07/number-hours-video-uploaded-to-youtube-per-minute/ (2019).

37 Kyle Devine, *Decomposed. The political ecology of music.* London: MIT Press, 2019.

38 Stephan Lessenich, *Neben uns die Sintflut. Die Externalisierungsgesellschaft und ihr Preis*. Berlin: Hanser, 2016, 64.

39 *Ibid.,* 82ff.

40 *Ibid*., 17.

41 *Ibid*., 69.

applies here as well.[42]

Digital Music as Appropriation of Nature

But it is precisely this lack of visibility that makes it difficult to maintain any critical distance from digitization. While vegan diets and the renunciation of air travel are now highly respected in society, skepticism about digitization always smacks a little of unworldliness.[43] It is even more difficult to translate such skepticism into concrete action. We all know the reason for this: digital media and ways of working offer so many advantages and have become so intertwined with every fiber of our existence that to renounce them would be tantamount to amputating a vital organ. For a composer or a musician, for example, digital abstinence would inevitably lead to making oneself disappear in the public eye. I, too, live permanently in this contradiction, as is particularly evident in the writing of this text. I upload videos, write twenty to fifty emails a day, publish and research almost exclusively online. It would be a terrifying idea for me not to be able to do all this anymore.

But on an artisanal and aesthetic level, too, the benefits of the digital are overwhelming. There is literally nothing left that cannot be transformed into music in some way. Any conceivable sound can be added to an arrangement, any impulses and data can be integrated into musical contexts. This (over)fulfills an age-old musical dream that began in the Baroque era at the latest: To be able to represent everything musically, to combine everything with every other thing, to turn everything into music. Johann Sebastian Bach already broke the boundaries of the circle of fifths, drew from everything that the musical understanding of his time offered, and made possible a previously unknown permeability between styles, affects, and keys. In the New Music of the 20th century, the linking and conquest of new territories of the sounding became the central elixir of life. Machine sounds, children's toys, everyday objects, spoken language: the list of what was reinterpreted into “composable material” in the course of these hundred years is endless. At times, this hunger for the new and unconsumed also transcended the boundaries of the sounding and expanded into the most diverse regions of the extra-musical. Social interactions became compositions; buildings became playable and walkable sounding bodies; gestures, movements, light and video became instrumental voices of a polyphony expanded into the visual.

Digital music fits conclusively into this tradition—and also especially where it is a matter of giving nature a musical voice. If you combine the infinite keyboard of the digital with the multi-dimensional circle of fifths of an expanded concept of art, then everything is possible: every living creature can play in a symphony, every landscape can become a walk-in concert hall. The most complex ecological relationships can be sensually experienced in interactive experiential spaces. Every conceivable relationship to nature can be presented and commented on in every conceivable way. Natural sound and musical

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42 Harald Welzer (see footnote 31), 74f.

43 The media educator Paula Bleckmann turns the concept of “unworldliness” upside down when she reports how elementary school children “who see a butterfly outside … wipe over the window pane to enlarge it. And if that doesn't work, they think the window is broken. That's what I call unworldly, when the world consists primarily of the world of [device] screens.” (cited in Peter Hanack, “Eine Grundschule ohne Tablets ist das Gegenteil von weltfremd. Interview mit Paula Bleckmann,” https://www.fr.de/wissen/schule-smartphone-tablet-digitales-lernen-interview-12255862.html 2019).

sound, irony and wit, bitterness and sarcasm, citational echoes and outrageous novelties can be dosed with a precision that could hardly be achieved by purely analog means.

Here's the catch: for all these great things to become possible, they require a process of transformation. In order to become musically formable and to be able to “play along,” nature must first be transformed into a form that can be artistically processed. In a sense, it must be translated into the aggregate state of the digital—be it by recording natural sounds and storing them digitally, or by converting measurement results or natural phenomena into binary signals. It is in the artificiality of things that the logic described above cannot be escaped. Externalization and decoupling are central and unchangeable characteristics of digital music. They cannot be removed even if the artistic intention goes in a completely different direction. This becomes particularly painful when music itself is supposed to become a voice in the sustainability discourse. It is not primarily the concrete, measurable environmental impact that makes this discrepancy between form and content so questionable. The sum total of damage from a single video or sample is rather small (similar to that of a single plastic bag). I find the subliminal and consciousness-raising effects of digital normalcy to be much more problematic. As a rule, they lead—just like any “permanent structural unsustainability”—to a “settling into lived contradictions.”[44] Only when one deals intensively with the connections outlined here does the dissonance of externalization become “audible” at all and begin to sound in disturbingly into the aesthetic content or the conveyed content. But our society is currently still far away from this. A supermarket that had plastic bags printed with appeals for more nature conservation would not have to wait long for the indignant shitstorm. In contrast, no one sees an inner contradiction in climate-moving YouTube videos.

I am convinced (even if I cannot empirically prove this thesis, apart from personal self-observation) that our digital music culture actively contributes to the alienation from nature. This seems to me to be increasingly true where nature itself becomes a musical theme. Digital music forms a context in which relating to nature is possible exclusively in the form of *appropriation*. For the programmatic or reflective reference *to* nature, a digital appropriation *of* nature is needed beforehand. Precisely because digital music has seemingly completely decoupled itself from nature, this absent nature can no longer be played with as space, processed as unruly work material, addressed as a friendly or hostile counterpart. The only possible relationship to nature is its appropriation and functionalization for the respective artistic concept. This also applies where the conceptual level is borne by humility or a critique of civilization. Involving nature in the composition process by digital means inevitably means confronting it with an attitude of domination, appropriation, and unrestricted control. No matter how nature-affirming an eco-soundscape may be, no matter how growth-critical the digital sonification of climate data may be—in the end, such concepts thus cannot help but reproduce a little of what they actually want to criticize. For they, too, contribute to the fact (albeit on a very small scale and with undeniably good intentions) that nature is being consumed and subordinated to human purposes. Digitizing bird calls and glacier sounds consumes no fewer natural resources than digitizing engine sounds for a Ferrari commercial. With each sample, another small droplet of

44 Bernd Sommer and Harald Welzer. *Transformationsdesign. Wege in eine zukunftsfähige Moderne*. Munich: Oekom, 2017, 40.

poison is dripped into the biosphere. Every digital forest simulation somewhere in the world makes another tiny contribution to the conversion of biomass into anthropogenic mass.

Now, of course, one can take the position that the question of the medium is secondary as long as the content is artistically relevant or serves a good cause. But what is the effect in the long run if the hegemony of the digital makes it seem completely normal, even in art, to regard nature as a raw material that can be exploited and used at will? Won't this inherent law of the medium ultimately have a stronger effect than any well-intentioned content? And are we really getting closer to the glacier or the earthworm by lining them up on the keyboard of digital music? In this way, we also turn them into a possession that we can shape artistically and consider contemplatively without needing rubber boots or getting our hands dirty. And in this way they also become the medium of the ever-the-same message: nature is subject to our control and creative sovereignty. It is controllable and has to be there for us.

This controllability has great appeal. But it is also a reflection of that dysfunctional relationship with nature and that "arrangement of incorporation"[45] in which our global misery has one of its many roots. And perhaps it is a not-so-insignificant part of this great, epochal problem: that smartphones and what comes out of them are of infinitely greater interest and fascination for most people than are earthworms and what comes out of them.

Plea for an *Avant-Garde* of the Analog

"Great mindshift," "Great Transformation," "Doughnut Economy," "New Enlightenment," "Reductive Modern,"[46] and so on: there are different names for the profound cultural change that the twenty-first century needs in order to find its way out of the climate and environmental crises. Despite all the differences in detail, the solution scenarios mentioned have one thing in common: they assume that there are planetary load limits that must not be exceeded and that unchecked growth therefore leads to ruin. And they are guided by the conviction that this problem also has a cultural dimension and will not be solved with new technologies alone. The cultural construct of an inexhaustible and completely controllable nature has reached its limits after a centuries-long history of success.

Establishing a new relationship with nature is a daunting task that will require all of our cultural resources. Regional characteristics and cultural differences will play an important role. Many proposed solutions are therefore not about patent remedies for the one, big global society, but about the greatest possible diversity of regional approaches to solutions. There are also many names for this. For example, there is talk of "real laboratories," "regional degrowth economies," or "pioneers of change." In other words, people who have the courage to embrace new forms of economic activity and coexistence, and places where sustainable ways of life can be tested and practiced. So far, music has hardly played a role in these solution scenarios. Especially not new music. That's a shame, because I believe its voice could be important and valuable—and without having to arm itself with the keyboard of unlimited digital possibilities. My conviction is that we need a new *avant-garde* of the

45 Stephan Lessenich (see footnote 38), p. 42.

46 The quoted terms are from the writings of Maja Göpel, Uwe Schneidewind, Kate Raworth, Ernst Ulrich von Weizsäcker, and Harald Welzer.

analog. Real laboratories of resonance. Experimental fields for new relationships with nature. And I believe that the musical heritage of New Music can offer some particularly valuable preconditions for this.

Let's be honest: what concrete consequences and options for action result from the contexts I have tried to describe? The illusionless answer is: none at all—at least for the vast majority. It would be naïve to hope for a broad popular or everyday cultural discourse on the environmental costs of streaming and digital music production in the near future. And it would be downright ridiculous to derive concrete demands for renunciation from the abstract contexts outlined here and—similar to speed limits, flight renunciations, and veggie days—to instigate a quarrel over digital abstinence or legal regulations of music consumption. Quantitative arguments would immediately lose out in such a debate. Of course, the climate and environmental damage caused by a single music video is negligible. And, of course, the idealistic damage of such an intervention would be enormous. Artistic freedom cannot be set off against biomass. And the value of a piece of music cannot be measured in greenhouse gas emissions. A change in thinking, especially in art and music, will therefore not be dictated from the outside or advocated with figures. It can only come from within, on the basis of an already existing foundation of values.

The heritage of New Music offers such a foundation of values. By this I do not mean a particular aesthetic current or musical language, but a basic attitude that was widespread in the 20th century. More than enough has been written and mocked in recent decades about how much the term “musical *avant-garde*” has fallen into disuse. But perhaps it is time to rediscover it under changed auspices. It might be possible to find some qualities in it that are currently becoming unexpectedly topical and valuable again. If you look at the history books of musical modernism, for example, you will find a great willingness to think in complex contexts and to get to the bottom of things. You come across an understanding of artistic relevance that doesn't necessarily have to rely on high reach and click numbers (back then they still called them “ratings”). One encounters a willingness to change and an eagerness to experiment; one encounters the unifying feeling of having to set out again and again and of being able to dare a new beginning. Above all, however, one encounters a large, central narrative that becomes highly interesting especially against the background outlined here: The search for *truthfulness in the musical material*.

This ideally charged material aesthetics knew many variations. In postwar West Germany, for example, certain chord combinations or timbres were considered to be downright “contaminated”: a prejudiced legacy of a critical and abusive use of music, with which one did not want to be affiliated any more than to the triumphalist architecture or propagandistic language of National Socialism. Quantifiable orders of magnitude did not play a role. The “used-upness” of a triad or the “quotedness” of a melodic phrase could not be measured by any scale in this world. Whether the vocabulary of a composition was “oppositional” or “affirmative” could only be determined if one knew the highly complex æsthetic discourses behind it.

My point here is not to revive old dogmas. But one can learn something for our digital present from the conscientiousness and zeal with which permissible and impermissible sounds were argued back then: it need not be indifferent to us from *which* material our music is formed. It need not be outlandish also to reflect on the distant effects and hidden implications of one's own actions. It can even be artistically relevant and enriching to take responsibility for the

material dimensions of music.

By a return to a tradition in the history of ideas—one that proposes thinking self-critically about one's own use of materials—an important topic could be addressed. There are strong social movements in our society for climate protection and vegan food, against clearing forests and cheap flights. But there is no digitization-critical movement of comparable size worth mentioning, at least not in Germany. The unease about the total digitalization of all areas of life has largely retreated into the private sphere or into resignation. Who else should play the role of a counter-public here? Universities? NGOs? The media? They are all drivers of and driven by digitization. At this point, we need similarly courageous, radical, and “off-beat” catalysts, as the artistic *avant-gardes* of the 20th century once were. People who are able to perceive the dissonance of externalization and who are willing enough to experiment in order to search for alternatives in as many places and in as many different ways as possible. One of these many, small sources of renewal could be what was once called “New Music.”

Here, one should not be content with the solutions of the day before yesterday and again want to smash, blow up, conquer, or appropriate anything. No, it's about something much more radical and subversive: turning off the computers. To go outside one's own front door. To expose ourselves unprotected to the polyphony, biodiversity and messiness of real life and—instead of continuing to plunder biomass and convert it into toxic waste and greenhouse gases—to let the earthworms do as undisturbed as possible what they have been doing for millions of years: helping us survive.

(in German 2021; English translation 2023)