with Animals: New Perspectives on Anthropomorphism (New York: Columbia University Press, 2005), 52–53.

14   Jonathan Burt, "The Illumination of the Animal Kingdom: The Role of Light and Electricity in Animal Representation," in Society & Animals 9:3 (2001) © Koninklijke Brill NV, Leiden, 2001: 204.

15   John Berger, "Why Look at Animals?" (1977), in About Looking (London: Writers and Readers, 1980); reprinted as John Berger, Why Look at Animals? (London: Penguin Books, 2009), 11.

16   Daston, "Intelligences," 39.

17   Ibid., 38.

18   Sigmund Freud, (1918), "The taboo of virginity—Contributions to the Psychology of Love III," in The Standard Edition of the Complete Psychological Works of Sigmund Freud, Vol. XI, trans. James Strachey (London: The Hogarth Press and the Institute of Psychoanalysis, 1958), 199.

20   Dominic Pettman, "When Lulu met the Centaur: Photographic traces of creaturely love," NECSUS_European Journal of Media Studies (Vol. 4, No. 1, Spring 2015): 143.

21   Dominic Pettman, Creaturely Love. How Desire Makes Us More and Less Than Human (Minneapolis: University of Minnesota Press, 2017), 6.

Curating's Technological Unconscious:
The History of Cybernetics and the Gaian Transformation of Curation

Adeena Mey

Cybernetics and the Exhibition Form

New Directions May Emerge, the Helsinki Biennale 2023 (HB23), provides a rare occasion to rethink a particular set of vectors that inform the way practices of exhibition-making and the tools through which they can be discussed critically and historically are shaped. Although, at the time of writing, the exhibition has yet to happen, I wish to discuss some of its undercurrent positions in relation to a possible genealogy of exhibition and curatorial thinking in which HB23 might be inscribed. But if this attempt to sketch such a genealogy does indeed historicize it, it hopes to do so by uncovering a largely ignored "technological unconscious" in the writing and discussions in exhibition histories and its archives. In this sense, it is driven by a revisionist impulse. But it also attempts to respond to our current moment and to discuss contemporary orientations in the (re)thinking of the biennale format. In other words,

it takes HB23's title quite literally and will try to interrogate what and how "new directions may emerge." As put by HB23 curator Joasia Krysa:

> Helsinki Biennial is committed to responsible exhibition-making and inclusive principles—not as a theme but an ethical position and a method—and this extends to the curatorial process. Curating is a practice that is best shared, and so the next edition of Helsinki Biennial is conceived as an exercise in co-creating to explore the ways of thinking and doing a biennial otherwise. I have invited a number of arts collectives, research institutions, and other kinds of entities—as "curatorial intelligences"—to join the process and to think through the issues pertinent to the biennial together.[1]

Here, it might be useful to single out the issues of co-creation and of including curatorial agencies that de-center the process of curation and put it at odds with what now almost seems to be a dated figure—namely, the curator as a single author, orchestrator, etc.—and their gearing towards the ethics of responsibility and inclusivity mentioned above, paralleled by an engagement with "some of the pressing issues of our time, encompassing environmental damage, political conflict and the impact of technology." [2]

These issues thus seem to constitute the cause and horizon of a renewed curatorial practice and a rethinking of the biennale format, affecting it at its very core, begging a rethinking of its modus operandi. My contention is that HB23 takes part in a wider transformation of exhibition-making and curation and that it invites a return to what I have called the "cybernetization of the exhibition." I have described this process, which consists in the redefinition of the exhibition and the institution as an informational and communicational medium, based on a series of writings and institutional experiments taking place in the 1970s by the likes of curators Peter Althaus, Jorge Glusberg, Pontus Hultén (to which we could add, amongst others, philosopher Vilém Flusser). Yet the 1970s also saw the emergence of a distinction between so-called "first-order" and "second-order cybernetics," the former being, broadly, the main inspiration for these curatorial and theoretical attempts to

transform museums and the exhibition form. My hypothesis is that HB23 and other recent curatorial experiments invite us to return to this bifurcation between first- and second-order cybernetics. It seems to me that this is relevant for two reasons. Firstly, with regards to the Anthropocene, second-order cybernetics—which engages with autopoietic, self-organizing systems—equips us better to rethink the role of biennales and the way they can address what Isabelle Stengers has called the "Intrusion of Gaia." Secondly, reconsidering these two trajectories of cybernetics is also necessary to recover what Yuk Hui calls the "technological unconscious" to re-include the question of the technical apparatus with which exhibition and curatorial thinking mostly engage on a representational or thematic level.

First-Order Cybernetics and Exhibition-Making

"Cybernetization" draws from the discipline theorized by Norbert Wiener, which he defined as the general science dealing with "the entire field of *control* and communication theory, whether in the machine or in the animal." Taken from the Greek *kubernētēs* meaning "steering/governing" it approaches machine and animal, living and non-living entities defined as information-processing organisms seeking homeostatic balance. This is achieved thanks to *feedback*, which enables self-regulation. Moreover, for Wiener, this notion of steering and control can be expanded to include neuroscience and computer science, as well as the political and social fields. For philosopher Claus Pias, cybernetics brought a shift through which "things as life, language, or work were united in the concept of the human being," whereas with this new epistemology they "encountered one another beyond human limits in control circuits of information, switching algebra, and feedback." [3] These descriptions correspond to a moment referred to as first-order cybernetics in the history of the discipline and I will subsequently address mutations in recent exhibition-making and thinking through so-called second-order cybernetics.

Here, we can render the broad definition of the process of cybernetization of the exhibition that I have written about with philosopher Yuk Hui:

> The cybernetisation of the exhibition is to be understood here as the cybernetic conception of the

exhibition, which implies its concrete—that is, spatial, technical, material—reshaping through the integration of the notion of *feedback*, and its conceptualisation as an organised retroaction system. The exhibition as a modulating apparatus acts both on the mediation between objects, visitors, and institutions, and on the attentional-sensible modalities of the spectators.[4]

The argument can be supported with examples from the history of exhibitions. As remarked in a report on the state of contemporary art museums published in *Museum*, the museological wing of UNESCO, the 1960s saw the emergence of institutions connected by "a kind of informal fraternity of co-operation between like-thinking museum programmers and represents the beginning of a system of comprehensive planning which will certainly become stronger in the years to come. All the museums mentioned co-operated with at least one show involving one or more of the others during the late sixties and 1970."[5]

In a series of interviews on the topic of the "museum of the future," French critic Yann Pavie identified this emerging network of new institutions and actors as comprising of Eddy de Wilde at the Stedelijk Museum in Amsterdam, Pontus Hultén at Moderna Museet in Stockholm (and later at the Centre Pompidou), Pierre Gaudibert at A.R.C. in Paris, Harald Szeemann and the Kunsthalle Bern, Michael Kustow at the ICA in London, as well as Peter F. Althaus at Kunsthalle Basel. This network sought to develop new types of art institutions that could respond to the artistic and cultural, as well as the social, political, and technological, mutations of the 1960s.[6] The emergence of such new museums happened at the juncture of several factors. First, the necessity to accommodate artistic experiments of the 1960s whose forms radically questioned the museum's traditional structure and functions. Second, an increasing reflexivity of art institutions towards themselves and their social missions, especially in light of the upheavals of the late 1960s; indeed, as stated by the curators in the *Museum* journal report transcribed by Szeemann: "We must no longer regard the museum as just an instrument for offering art to the public. The museum has become more critical both of art and of itself, because it has become aware of its function outside

daily life. It does indeed function outside the system, sets itself up in opposition to the establishment, yet continually shows itself to be an instrument of the system."[7] These factors can be seen as having been cyberneticized, the new aesthetic, social, political, and infrastructural imperatives of the museum being recast by the broader epistemological transformation towards conceiving of all entities as information-processing systems. In the field of cultural institutions, this transformation has resulted in a conception of museums as centers of information or communication, one of the effects being a closer involvement of museums with research and universities and, at the same time, an increased popularity of museums among a general audience. Contemporary attempts to understand and redefine this emerging exhibitionary complex include: Hulten's "museum as site of communication" epitomized by the information infrastructure of the Centre Pompidou; curator Jorge Glusberg's concept of the "museum of communication"; Flusser's proposal to reorganize biennials on a scientific format, as "open and fluid forms," according to communication theories; Althaus' notion of the "Open Museum/Das Offene Museum"; or Wim Beeren's proposal to move "From exhibition to activity" realized in his nationwide outdoor project for *Sonsbeek'71*. For Glusberg and his project of a "critical museology," it is necessary to reinscribe the museum beyond artistic discourse in order to place it in the channels that participate in its internal structuring and its social effectiveness: the museum is fundamentally a "sign comprising other signs" and can therefore be designated by the McLuhanian expression of "museum-as-message." As for Althaus, then director of Kunsthalle Basel, on the basis of his research into urban space and its rationalization—the development of a "thought model" for flexible structures capable of growing, shrinking, and regenerating, allowing humans to identify with this environment, he formulated the notion of the "open museum," a concept that was put to the test in the 1970 exhibition *Das offene Museum*, which was held in the Swiss museum under his direction at the time. Beeren, in the catalogue introduction of *Sonsbeek'71*, wrote:

> It has become one of Sonsbeek's aims to stimulate a greater public in the awareness that such things as visual

phenomena exist, and that those phenomena often concern space. Until recently those visual phenomena were confined to the realm of science or to the grounds of the museums. But now the time has come that artists are deeply involved in those spatial relations, and the attention they pay to it has long since ceased to be expressed in mass alone. Spatial relations means also: to be involved.[8]

In Beeren's curatorial frame, this emphasis on "spatial relations" and "activity" also pointed to the limits of the very idea of curating exhibitions. As he put it:

It is evident that the term exhibition is only partly relevant. We have turned to the word "manifestation" and subsequently to "activity". *Sonsbeek'71* is more like a workshop than a show. This means the Dutch public will not be able to take a walk amongst impressive statues, but that it will have the opportunity of a much closer involvement.[9]

But the most cogent example of this moment of (self-)redefinition of the museum, on which I wish to focus a little bit more here, is best described by Hultén:

Around the 1960s, we discovered that the traditional museum could be opened to radically different works bearing the aggressive values of what is authentic, original and new; commissioning artists' group creations whose originality and outcomes could stand at the antipodes of the art classically admired and admitted; playing alternative music, redefining interpretation; showing films other than those of established commercial circuits; in a word, betting on the event and on life to the detriment of outdated habits. The museum became a parallel place.

Hultén's museological and curatorial concept of the "museum as site of communication" built on his previous work in Stockholm as director of Moderna Museet and on a series of acclaimed international shows. His work as director of the

department of plastic arts at the Centre Pompidou drew on and extended his vision realized through attempts to reinvent art institutions and experiments in exhibition-making.[10] Conceived during the 1960s while he was at Moderna Museet, Hultén's idea of the museum was synthesized in the notion of a "museum in movement." At that point, accounting for the artistic, social, and political changes of the time, an advanced museum's mission was, according to Hultén, not only to accommodate the experiences of late modernism and of the expanded arts, but, as exhibition theorist Kim West puts it, to no longer consider the museum as "a sanctuary that upheld the pure freedom of modern art to express its dynamic nature, but a catalyst that would render contemporary art active as a principle of extension of the freedoms of democratic society."[11] In its most programmatic and theoretical version, Hultén's museum was to become a "research center" and its curator "its coordinator," a conception in which the avant-garde horizon of the blurring of art and life would be accomplished thanks to art's modeling on information and communication theories. As he put it in an interview with Yann Pavie:

We would like to do what the Surrealists called the "critique of life". Such a mechanism is interesting only insofar as it functions permanently and is based on a methodology. A true science of information is being formulated in correlation to the new orientation taken by the sciences and the human sciences: computer sciences (*informatique*), cybernetics, linguistics, semiology, art history ... concepts of theory, history, space, time, sign are all called into question.[12]

Although this statement was made in 1971, in reference to the model of Moderna Museet, two years prior to his appointment at Beaubourg, a diagram sketched by Hultén also directly influenced the conception of the Centre Pompidou as an organic-machinic infrastructure. This diagram of a "site of communication" consisted of four concentric circles respectively standing for four kinds of "information," meaning that all components composing the art institution were to be understood as informational elements, summarized as follows:

1. Primary Information (teleprinted communication);
2. Spaces and tools for the treatment of information (workshops for the public, artists and museum staff);
3. Processed information (art exhibitions, films, music, dance, theatre...); 4. Art collection, film archive ... Processed and saved information: memory.[13]

These four layers were further characterized in detail by Hultén:

> The outermost layer, the spherical envelope, discerns the universe of daily life, which is characterised by a concentrated acceleration of information. This information, as far as possible, should not be edited. It is for us raw and unmediated material. Here we find for example teleprinters from all news agencies. This will represent a sort of "degree zero" of information, a place where the individual is attacked by all kinds of information. Of course, it will not be possible to obtain unmanipulated information, but the very fact that these pieces of information will often be contradictory will create a situation of conflict, a critical situation. The situation of the street is recreated and intensified, the conditions for discussion improved.
>
> The second layer will be reserved for workshops, that is, it will include spaces and tools: places where means of production are made available, from hammers to mere nails, from paintbrushes to computers. These tools are available, but nothing regarding their use is decided, nor the fields to be exploited, nor the goals of these experiences. Museum staff might act as instructor for these machines. These workshops might be used either by an artist, by us or by everyone. Specialists in the fields of art or communication will work on all sorts of problems.
>
> The third layer of the sphere will present productions from the workshops and will be dedicated to manifestations: visual arts, films, photos, dance, concerts ... but also exhibitions of "finished products." This is cultural activity as we already know it. But it is probable that contacts with the workshops will give this activity a more revolutionary aspect.

> The last or core layer will contain the "memory" of processed information; this is the museum's conservation and collection task.[14]

Through this cybernetic conception of the museum, Beaubourg was also understood to become France's cultural brain, decentralizing some of its programmes and accompanied by a specific idea of museum experience, "the place *par excellence* for communication, encounters, broadcasting (*diffusion*)."[15] These ideas of free-flowing circulation have notably been criticized by Jean Beaudrillard, for whom the only thing actually circulating fluidly seemed to be the "beguiling masses," but as regards "the stock—works of art, objects, books—as well as the so-called polyvalent interior workspace: there the flow has stopped entirely."[16] Robin Mackay, in a discussion of *Les Immatériaux*, wrote that Beaubourg was merely a "receptacle for the 'festive neoconservatism' [denounced by philosopher Gilles Châtelet] in which 'cultural production' is incited to be a facsimile or working scale-model of economic dynamism, oriented towards an optimisation of the liquidity of all flows."[17]

Exhibition-Making's Ecosystemic Turn?

Here, I wish to point to another question. Indeed, if it is broadly first-order cybernetics that was the main inspiration for these curatorial and theoretical attempts at transforming museums and the exhibition-form, the 1970s also saw the emergence of a distinction with second-order cybernetics. As mentioned earlier, first-order cybernetics focuses on information, its circulation and control in systems aimed at maintaining homeostatic balance, and conceives of both living and non-living organisms as information-processing entities. As for the second, referred to as "the cybernetics of cybernetics" by Heinz von Foerster, it is more concerned with self-referring, self-generating, autonomous, systems (machinic or living), as expressed through the concept of *autopoiesis* coined by cognitive scientists Humberto R. Maturana and Francisco J. Varela in their book *Autopoiesis and Congition: The Realization of the Living* (1972/1980). The 1970s also saw the emergence of the Gaia Hypothesis, proposed by chemist James Lovelock and microbiologist Lynn Margulis, which

"suggests that living organisms on the planet interact with their surrounding inorganic environment to form a synergetic and self-regulating system that created, and now maintains, the climate and biochemical conditions that make life on Earth possible."[18] As literary theorist Bruce Clarke has suggested, the Gaia Hypothesis "echoe[s] ecosystem ecology despite its arrival from outside of ecology proper."[19]

In the field of contemporary art, curator and professor of art and economies Mi You has recently identified:

> a recognizable ecosystemic turn in organizational and curatorial practices [...] Ecosystems strive to structurally integrate different "stakeholders" including artists, audiences, and their wider communities, administrators, and curators, as well as infrastructures [...] In arts and culture, one finds Ian David Moss's "ecosystem-based arts research" and recent calls to conceive of museums as ecosystems, for example at the Taipei Biennial in 2018.[20]

As for HB23, it engages with notions of ecosystem on various levels. For instance, it places "particular emphasis on outdoor artworks which subtly operate in dialogue with the surrounding environment and its unique ecosystem." TBA21–Academy, one of HB23's curatorial intelligences is presented as "a contemporary art organization and cultural ecosystem fostering a deeper relationship to the Ocean through the lens of art to inspire care and action."[21] New modes of interactions between the biennial and its environment are also expected to be fostered by a non-human curatorial intelligence, an AI Entity called *Newly Formed* created by artist Yehwan Song. Based on multimodal machine-learning technology and the collection of Helsinki Art Museum HAM, *Newly Formed* is designed to produce "new and unexpected artwork groupings. The groupings respond to inputs including the AI's analysis of the artworks, Biennial visitors, and Helsinki's geography."[22] "Ecosystem," then, in this context, seems to refer to a rethinking of the biennale format as a collaborative network itself interacting with a variety of milieus (natural, techno-social, cultural, etc.), based on a variety of distributed curatorial agencies. Mi You's discussion of contemporary art's "ecosystemic turn" is written in response to

documenta fifteen and ruangrupa's experiment with *lumbung*. As put by ruangrupa:

> Documenta fifteen is practice and not theme based. It is not about lumbung or the commons, or any such notion. When we started, we realized that making a "showcase" of collective practices, done by many art centers, would be a trap. Instead, this exhibition and journey are with collectives and artists who have longstanding experience with practicing and not preaching (much)—walking the talk—and who would like to learn new tricks, strategies, and approaches from one another to enrich their local communities. So, in a way it is a study of many models.[23]

This study of many models is encapsulated in ruangrupa's own definition of the notion of *ekosistem*: "Ekosistem is the Indonesian term for ecosystem, developed in reference to, but not synonymous with, the ecological concept of ecosystem. 'Ekosistem' or 'ecosystem' describes collaborative network structures through which knowledge, resources, ideas, and programs are shared and linked."[24]

But with HB23, a different genealogy of the ecosystemic turn can be sketched. Without submitting HB23 to any linear reading or clear, logical, continuous causalities, looking at some of Joasia Krysa's formulation of decentered modes of curating and non-human curatorial agencies might help complicate the contemporary landscape and the articulation of this ecosystemic turn. In *Curating Immateriality* (2006), Krysa asked: "How do curators respond to new forms of self-organising and self-replicating systems, databases, programming, code and source code, net art, software art and generative media within the wider cultural system? What new models of curatorial practice are needed to take account of the production processes, that are increasingly collaborative and distributed over technological networks and software?"[25] And in an earlier essay, Krysa questioned a fundamental shift that can be seen as being the core concern within the ecosystemic turn. Indeed, the issue, she wrote (about "online curating," but the question can be translated to recent modes of self-generated organizations), "is not simply to engage with online curating in terms of modes

of display or new objects to select, but to consider how the practice itself has been transformed by distributed networks."[26]

These two examples suggesting an emerging paradigm in contemporary art founded on ecosystemic notions articulate two directions. The Indonesian *lumbung* and *ekosistem* draws from non-Western epistemologies and cosmologies, potentially pointing at the articulation of a "cosmotechnical" and "technodiverse" thinking of exhibitions.[27] With HB23, and its cybernetic epistemology, emphasis on network systems and now A.I., we find ourselves with a more future-oriented approach. Either way, Mi You's diagnosis of documenta fifteen might seem to apply. Indeed, she suggests that "the flourishing of these concepts raises an intriguing question: Does the organizational become an end in itself, a kind of institutional self-actualization of the artists, curators, and community organizers? Are we entering an era in which artistic curatorial practices are merged into organizational development, or even entrepreneurship?"[28] Here, what seems to divide Mi You and ruangrupa echoes Bruno Latour's asking what the politics of ecological thinking could be. Indeed, Latour notes:

> how much difficulty ecology movements have always had finding a place on the political chessboard. On the right? The left? The far right? The far left? Neither right nor left? Elsewhere, in government? Nowhere, in utopia? Above, in technocracy? Below, in a return to the sources of wisdom? Beyond, in full self-realization? Everywhere, as the lovely Gaia hypothesis suggests, positing an Earth that would bring all ecosystems together in a single integrated organism?[29]

For Yuk Hui, "Modernity was characterised by a technological unconsciousness willing infinite progress. By a technological unconscious, I mean the supposition that human beings could advance history according to their will and desire while ignoring the apparatus that makes the will possible, and that turns desires into nightmares." In this regard, should it become an increasing and more generalized trend, the experiment shaping this ecosystemic turn literally *matter*, for their explorations of infrastructure and the ecosystemic *work through* their

technological unconscious. By so doing, they might represent a symptom of the exit from the Modern and articulate a path towards new directions.

1   Joasia Krysa quoted in "Helsinki Biennial 2023 is created together with five curatorial collaborators," Helsinki Biennial website, https://helsinkibiennaali.fi/en/story/helsinki-biennial-2023-is-created-to-gether-with-five-curatorial-collaborators/.

2   "Helsinki Biennial 2023 brings together twenty-nine artists and collectives to exhibit across Vallisaari Island and the Finnish capital" [Press Release], available at: https://helsinkibiennaali.fi/en/media/.

3   Claus Pias, "The Age of Cybernetics," 2003, in Claus Pias (ed.), Cybernetics. The Macy Conferences 1946–1953. The Complete Transactions (Zurich/Berlin: Diaphanes, 2016).

4   Yuk Hui and Adeena Mey, "The Exhibition as Medium: Some Observations on the Cybernetisation of the Institution and the Exhibition," Afterall. A Journal of Art, Context and Enquiry, Issue 53, 2022: 80.

5   Pierre Gaudibert, Pontus Hultén, Michael Kustow, Jean Leymarie, François Mathey, Georges Henri Rivière, Harald Szeemann, Eduard de Wilde, "Exchange of Views of a Group of Experts," Museum, Vol. XXIV, no. 1, 1972: 48–49. This report results from two meetings (6–7 October 1969; 1 April 1970) in Paris with contemporary art curators and museologists on the initiative of UNESCO. This group of experts, as it was referred to, met in order to discuss "problems of common interest to Western museums of contemporary art: ethics, organization, exhibitions, cultural involvement and other events; relations between such museums and their trustee bodies, artists, the art market, press and other mass media, the public, publishers; ideas and experience in relation to architecture and equipment. Tape recordings were made of these discussions." Furthermore, "A questionnaire taking into account the content of these discussions was sent to 116 museums of contemporary art or contemporary art sections. Sixty-six replies

were received." These conversations were subsequently rewritten into this published account by Harald Szeemann, curator at the Bern Kunsthalle. Michael Kustow of the ICA in London wrote comments on the questionnaire. Georges-Henri Rivière, "Editorial," Museum, Vol. XXIV, No. 1, 1972: 4.

6   Gaudibert, et al., "Exchange of Views of a Group of Experts," 5–32.

7   Ibid., 6.

8   Wim Beeren, "From exhibition to activity," Sonsbeek 71, exh. cat., 1971, 11.

9   Ibid., 13.

10   Hultén's projects are widely acknowledged in the history of exhibitions. Moreover, some represent important case studies for the archaeology of moving-image exhibitions. Shows he curated at Moderna Museet such as Hon – en katedral (1966), Andy Warhol (1968), or The Machine as Seen at the End of the Mechanical Age at Moma (1968–69) all experimented with specific ways of presenting moving-image works inside the gallery (or inside Niki de Saint Phalle's gigantic doll in Hon). On Hon – en katedral see Benoît Antille, "'HON – en katedral': Behind Hultén's Theatre of Inclusiveness," Afterall, no. 32, Spring 2013: 72–81. On The Machine as Seen at the End of the Mechanical Age see Julie H. Reiss, "The Moving Image as Seen at the End of the Mechanical Age," François Bovier and Adeena Mey (ed.), Exhibiting the Moving Image. History Revisited (Zurich, JRP-Ringier, 2015), 18–27.

11   Kim West, "The Exhibitionary Complex. Exhibition, Apparatus, and the Media from Kulturhuset to the Centre Pompidou, 1963–1977," Södertörn Doctoral Dissertations (Stockholm: Södertörn University, Aesthetics, School of Culture and Education, 2017), 45. West's dissertation thoroughly retraces this shift in Hultén's thinking about exhibitions and

museums from "museum in movement" to the museum as "catalyst for social change," as "broadcast station," and as "live centre of information."

12   Yann Pavie, "Vers le musée du futur: entretien avec Pontus Hultén," Opus International, no. 24–25, May 1971: 63.

13 + 14   Ibid., 58–61.

15   Yann Pavie, "Vers le musée du futur: entretien avec Pontus Hultén," op. cit., 63.

16   Jean Baudrillard, "The Beaubourg-Effect: Implosion and Deterrence" (trans. R Krauss and A. Michelson), October, Vol. 20, Spring 1982, 3.

17   Robin Mackay, "Immaterials, Exhibition, Acceleration", in Yuk Hui and Andreas Broeckmann (eds.), 30 Years After Les Immatériaux. Art, Science and Theory, (Lüneburg: meson press, 2015), 225.

18   https://www.sciencedirect.com/topics/earth-and-planetary-sciences/gaia-hypothesis.

19   Brian Clarke, Gaian Systems, Lynn Margulis, Neocybernetics, and the End of the Anthropocene (Minnesota, MI: University of Minnesota Press, 2020), 10.

20   Mi You, "What Politics? What Aesthetics?: Reflections on documenta fifteen," e-flux, issue 131, November 2022, https://www.e-flux.com/journal/131/501112/what-politics-what-aesthetics-reflections-on-documenta-fifteen/.
21   "Helsinki Biennial 2023 brings together 29 artists and collectives to exhibit across Vallisaari Island and the Finnish capital."

22   Michael Irwin, "Forward-looking Helsinki Biennial Engages AI Curator," Ocula, 10 April 2023, https://ocula.com/magazine/art-news/forward-looking-helsinki-biennial-engages-ai/.

23   Ruangrupa, 'Keep on doing what you're doing…', documenta fifteen handbook, (Kassel: Hatje Cantz, 2022), 30.

24   Ruangupa, "ekosistem," documenta-fifteen Glossary, https://documenta-fifteen.de/en/glossary/. It is also useful to quote ruangrupa's definition of lumbung:

"lumbung as a collectively-governed architecture for the storage of food serves a community's long-term well-being through communal resources and mutual care, and it is organized around a set of shared values, collective rituals, and organizational principles. ruangrupa translates and continues this tradition of sharing within our own practice. We do not consider lumbung merely as a chosen 'theme' for documenta fifteen. Instead, it is deeply imbued in ruangrupa's everyday practice and is a summary of our methods and values thus far. As a collective, we share resources, time, energy, funds, ideas, and knowledge among ourselves and others." See Ruangupa, 'documenta fifteen and lumbung practice', https://documenta-fifteen.de/en/press-releases/documenta-fifteen-and-lumbung-practice/.

25   Joasia Krysa, "The Work of Culture in the Age of Network Systems," in Joasia Krysa (ed.), The Work of Culture in the Age of Network Systems (Brooklyn NY, Autonomedia, 2006), 9.

26   Joasia Krysa, "Kurator: A Proposal for an Experimental, Permutational Software Application Capable of Curating Exhibitions," in Lars Bang Larsen, (ed.), Networks (Cambridge, MA: The MIT Press, 2014), available at:https://www.academia.edu/30945605/
27   See Yuk Hui's The Question Concerning Technology in China. An Essay in Cosmotechnics, Falmouth, Urbanomic, 2016; "Rethinking Technodiversity," https://courier.unesco.org/en/articles/rethinking-technodiversity.
28   Mi You, "What Politics? What Aesthetics?: Reflections on documenta fifteen."

29   Bruno Latour, Politics of Nature. How to Bring the Sciences into Democracy?, trans. Catherine Porter, (Cambridge MA/London: Harvard University Press, 2004), 5.

What Never Was but Might Yet Have Been[1]

Lívia Nolasco-Rózsás

*T*he last decades have brought about seismic shifts in the capabilities of computing machines. As computation unfolds around us, possibilities and imaginaries turn into actualities. But questions are also raised about the societal and political embeddedness of digital technologies. The artistic and curatorial projects that I will discuss below adopt a critical attitude that enables their authors and also their audiences to articulate these questions around the potentialities and biases that phenomena related to computation, including artificial intelligence and machine learning, propel. They provide us with an answer to the question of how the notion of agency changes if human and non-human entities collaborate. What is the relation of contamination to computation? And of regeneration? Could the latter lead to re-worlding?

This text will attempt to give partial answers to these questions via projects of prefiguration (a term used here