

Mateusz Borowski, Mateusz Chaberski,
Małgorzata Sugiera (eds.)

EMERGING AFFINITIES

Possible Futures
of Performative Arts

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This volume is a response to the growing need for new methodological approaches to the rapidly changing landscape of new forms of performative practices. The authors address a host of contemporary phenomena situated at the crossroads between science and fiction which employ various media and merge live participation with mediated hybrid experiences at both affective and cognitive level. All essays collected here move across disciplinary divisions in order to provide an account of these new tendencies, thus providing food for thought for a wide readership ranging from performative studies to the social sciences, philosophy and cultural studies.

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Foreword

Mateusz Borowski, Małgorzata Sugiera

In the last two decades, the landscape of performative art practices has radically changed. New forms at the crossroads of science and fiction, 'pure' and political art, and one- and multi-person projects have been rapidly emerging and developing. The new forms hybridize various media, merging live and mediated participation to offer individualized experiences on both an affective and cognitive level. As a consequence, every artifact produced in these arrangements becomes a unique example of a new idiosyncratic genre, and in many cases, the participant could hardly say she has to do with an artifact at all. Many artists try to enlarge the scope of life experiences instead of performing a traditional kind of aesthetics. As a matter of fact, ever since critics have tried to keep abreast of these radical changes, they have defined and labeled the emerging hybrid forms with a range of hyphenated terms, such as bio-art, techno-art, multimedia-art, remix-art, recycling-art, junk-art, drift-art, Net-art, post-Internet art, and several others. Many of these names disappeared as quickly as they appeared, together with the new practices they were meant to grasp. Scholars adopted and elaborated at least part of these terms and concepts, or came up with new theoretical inventions, such as Nicolas Bourriaud, who wrote on relational aesthetics and then postproduction as a creative method (cf. 2002a; 2002b). Others, like Julianne Rebentisch in *Aesthetics of Installation Art* (2012) or Josephine Machon in *(Syn)aesthetics* (2009), looked for umbrella terms to embrace the new performative phenomena. As a result, narrowly specialized research fields and idiomatic research methodologies have emerged, many of which could not be employed in the context of another performative practice. The terminology developed for bio-art becomes rather problematic when applied to forms that go by the name of techno-art, even when the problem of the new approach to spectating/reception/co-creation/interaction is taken into account. Hence, the growing need for new methodological approaches and novel analytical languages to meet the challenge is increasingly visible, and demands we connect various disciplines and discourses to investigate possible futures of performative art practices. We must look into futures to open new research vistas that will allow us to see the past from novel archaeological perspectives.

The authors of *Emerging Affinities: Possible Futures of Performative Arts* address a host of contemporary hybrid (aesthetic) phenomena, crossing traditional disciplinary divisions both to provide an account of these new tendencies in performative practices and to offer new methodological approaches and definitions. It comes as no surprise that several authors explore postdisciplinary perspectives from the emerging field of Anthropocene studies, as it is exactly at this juncture that the need for both transversal methodological approaches and speculation on not-so-distant futures to better grasp today's phenomena and challenges is demonstratively present. Significantly, one of the main aims of this emerging field is to subvert the basic dichotomies of the Western episteme by showing their historicity, and to supersede them through local and ever-shifting alterities. One of the first to be superseded is the dichotomy between Nature and Culture/Technology which has been formative for our civilization and, treated as part and parcel of capitalist industrial development, has been more often than not highlighted as the main cause of today's ecological catastrophe.

In "Love your Monsters," Bruno Latour, one of the founders of science and technology studies and, at the same time, a severe critic of purification processes undertaken by the Moderns, revisits Mary Shelley's *Frankenstein*. He does so in order to demonstrate that, to save the Earth's ecological heritage, we should stop laying disciplinary boundaries, to embrace human power, technology, and larger modernization processes. To steer clear of claims of exponentially approaching imminent catastrophe and the need for radically downscaling our economy on the one hand, and from Utopian plans to save the Earth by geoengineering on the other, Latour draws a new vision of both human agency and the planet through a new reading of this canonical novel. Interestingly, he does not claim that our technologies have always been perfectly natural, as do other post-environmentalists. For example, in the same volume, Michael Shellenberger and Ted Nordhaus underline that even our nuclear plants are drawn "from the raw materials of the Earth" (2011: 12). Far from this, "Love your Monsters" returns to *Frankenstein*, as it lives on in popular imagination as both the widely known modernist myth of human mastery, and a cautionary tale against human hubris and technology that is conjured whenever we feel endangered by a new technological invention, most recently cloning and GMO. "We use the monster as an all-purpose modifier to denote technological crimes against nature," writes Latour, and points out further that, in so doing, we "confuse the monster with its creator" (2011: 21). To his mind, Frankenstein's real sin was not so much to imitate God's creative act and challenge innate human limitations, but to abandon the creature and condemn it to a solitary life. As such, he reads the novel as a parable about political ecology, and is certain that we should never even dream of separating ourselves from the non-human world, technologies, and our nature; we cannot be disentangled from them. However, to do away with the myth of human mastery, we must exchange

the notion of modernity as merely humankind's emancipation from Nature, for what he calls a "compositionist" one. For this notion "sees the process of human development as neither liberation from nature nor as a fall from it, but rather as a process of becoming ever-more attached to, and intimate with, a panoply of non-human natures" (ibid: 22). Therefore, Latour sees the growing necessity of rewriting the emancipation narrative as the ever-increasing attachment between things and people. To support his new reading of *Frankenstein*, he directs the reader's attention to one important fact. Almost every day our newspapers report "more entanglements of all those things that were once imagined to be separable – science, morality, religion, law, technology, finance, and politics" (ibid: 22). Yet we have not only been reading about this almost every day for the last couple of years. Significantly, we have also experienced it by immersing ourselves in these entanglements in a range of performative art projects. London-based Marshmallow Laser Feast (MLF) collective's multi-person and multi-sensory immersive installation *We Live in an Ocean of Air*, which premièred at Saatchi Gallery in late 2018 is a case in point here.

MLF's first artistic VR project, *In the Eyes of the Animals* (2015), demonstrated a unique combination of technologies from untethered virtual reality, heart rate monitors, breath sensors, and body tracking devices, for a complete immersion in a world beyond human perception. This mixed reality project offered a group of viewers taking a walk in Grizedale Forest a first-hand experience of the local symbiotic system, otherwise inaccessible to the human senses. It presented a narrative, based upon a typical food chain, starting with a mosquito which sees CO₂, progressing through a dragonfly which sees 300 frames per second and a full light spectrum, and then, combing some physiological features across the family of the same species, a frog. It ended with an owl shot by a hunter, but before that, each viewer could explore the perspective of a creature with abstract peripheral vision, as its eyeballs are almost egg-shaped. Although the artists consulted experts, including those from London's Natural History Museum, and based their work on scientific fact, this was a speculative project, an approximation of what it could mean to view the world as another species. It should be stressed here that the installation also offered a tactile experience. For example, when looking through the eyes of the dragonfly, the viewer felt vibrations on her back, giving her a feeling of not only seeing the world through the insect's eyes, but of having wings as well. However, the project primarily engaged sight, and in this respect, it differed from many previous mixed reality installations of this kind. Mostly, what has been recognized as political art in the Anthropocene brings in the other human senses, trying to critically subvert the dominant oculo-centric perspective. Instead, MLF's *In the Eyes of the Animals* could be defined as an instructive exercise in perspectivism, which has been discussed by critical anthropologists in their studies of Amerindian cultures. For example, in *Beyond Nature and Culture*

(2008), Philippe Descola quotes the cosmologies of Achuar and Chewong peoples as examples of relative vision of each living creature. Every animal is capable of imagining itself as a different species, and seeing the world through the eyes of another. Therefore, its identity is fluid, and dependent on situated relationships with others, and never freezes into a stable set of categories. The ability to take the position of the other and see from a different point of view is the ultimate condition for the well-being of all creatures and their peaceful co-existence. Similarly, Eduardo Kohn defines perspectivism as specific for Amerindians in his research project of an anthropology beyond the human. In *How Forests Think* (2013), perspectivism allows one to see other creatures as both alter and equal to us, made of the same primordial matter. They remain on the same footing, since they are humans for themselves, able to perceive our alterity. By no means do we want to suggest that we are able to experience what is 'natural' to Amerindians only through cutting-edge technology in our disenchanting world. In both cases, we are dealing with cultural apparatuses that, in a similar process of acculturation, albeit differently, teach us how to look at the world and make meaning. A more recent MLF project, *We Live in an Ocean of Air*, demonstrates this particularly clearly, once again with a complex VR rig. The main aim of the project is not only to make every breath exhaled by the participant visible as a cluster of small red dots, but also to show how these red dots become blue, when a tree – a central element of VR simulation – 'converts' it into oxygen. In other words, here the human as such and every participant in particular is intentionally presented as a part of a living world. Therefore, when asked in an interview if we can reconnect to nature through VR, Ersin Han Ersin of MLF answered as follows: "Virtual reality can open a better space to understand everything around us that wasn't available before" (2017). He formulated his answer in a rather general way. Therefore, to make our point, we have to ask what exactly was unavailable before MLF's latest up-to-date project helped us to understand it.

Unlike *In the Eyes of the Animals*, this multi-sensory multi-person virtual reality installation takes place in a traditional space – downstairs in the Saatchi Gallery, in two neighboring half-open spaces. It is not only your breath and the blood flowing through your body and the bodies of other visitors that are virtual. A giant sequoia tree from the Sequoia National Park is also projected. The smell of humid earth distributed in the installation space and the changing temperature are not virtual, but still artificial. Participants are invited to enter a realistic forest. It is virtual/artificial, and at the same time overpoweringly real to one's senses. You remain yourself, but you see the world from a radically different perspective, and this affects your behavior here and now. You can see how powerful this immersive experience is even before entering the installation, watching a group of visitors in the installation space, equipped with VR rigs. This foreknowledge makes you more cognizant of your own body and its movements, of the situation of being

seen when seeing a virtual world. In this respect, the MLF installation makes you feel like you are stepping onto the canvas, a metaphor which applies not just to this project. It is worth reconsidering in the context of an argument by preeminent German art historian Hans Belting.

In his *Florence & Baghdad* (2008), Belting argues that the realistic perspective – based on the stable relationship between the subject and the world, with the human gaze as a focal point, producing images as seen through a window – remained a theoretical ideal in the painting and architecture of the Renaissance. Only in the theater of the epoch did it materialize, in part through the proscenium arch. It was proscenium arch theater, with its attendant cultural practices, which conditioned and preserved a human-centered perspective, not only as a privileged way of seeing, but also – or even primarily – as the very basis of the Western episteme, long into the twentieth century. The introduction and wide acceptance of the central perspective was a much more significant development than just a shift in the concept of artwork and in the systems of representational conventions; it was closely linked to a widespread reorganization of knowledge and social practices. At that time, a new kind of observing body was born, which gradually became a component of new social, libidinal, or technological machines, economies, and apparatuses. The paradigmatic incarnation of this body is a traditional theater-goer who sees within a prescribed set of possibilities and limitations, even though she is rarely aware of them because they have been ‘normalized.’ The fundamentally theatrical setup of the *camera obscura* can be easily recognized even in the forms of experimental theater that came in the wake of performance art of the 1960s and 1970s. As Belting demonstrates, the human-centered perspective in Renaissance painting, architecture, and theater for the first time allowed the act of looking to be inscribed into the represented space, in order to persuade the observer that she perceives both a represented world and reality with her own eyes. One and the other seem to be constituted, controlled, and measured by her active gaze. However, the presence of the gazing subject within represented reality, today’s virtual reality included, is only a simulation, an effect of the workings of geometrical construction that, while sundering the act of gazing from the physical body of the observer, creates a vacant place; a place for rent, so to speak. Any observer who occupies this place presumes that the gaze represented is her own. For Belting, it is mainly because of the workings of the human-centered perspective that this symbolic form and cultural practice is a privileged site of meeting with oneself as the other. In this respect, *We Live in an Ocean of Air* offers a viewing experience markedly different from that elicited by the central perspective. Each viewer sees not only the represented gaze, but also herself as an inherent part of the picture. She sees her body moving through the virtual space, her every breath. Moreover, the world she sees is, in a sense, a product of her body, as it is generated from the data gathered by her body’s functions in real time. In other words, it is no

longer a place to rent. It is a world that comes into being through a performance of a human body connected with technology.

Significantly, MLF is both an artistic collective and a small experiential studio that often works on commercial commissions, not only to fund their art projects, but also to build their own pipelines and toolkits, which they then use in their installations. Therefore, MLF truly works at the intersection of art and technology, and the technology they employ is the same in both commercial and artistic endeavors. As a result, it can hardly be said that they use technology to create a special kind of an aesthetic experience, understood as only specific to the realm of art. Nor do they make perfect mimetic representations of the world. Rather, they gather data in a digital library or a digital archive. As Ersin Han Ersin said in the aforementioned interview: “We often call it digital fossils because if that forest is gone, we still keep data of the forest quite accurately” (2017). Clearly, they think of themselves as involved in a scientific undertaking, even though they use their “digital fossils,” as they called it, as material for art commissions.

The contributions to this volume provide ample evidence that work across disciplinary boundaries, connecting science, technology, aesthetics and politics, is becoming a new idiom of performative practices. These new participatory forms effectively undermine our received aesthetic categories, developed since the Enlightenment and throughout the nineteenth century and based on a number of dichotomies (author/work of art; work of art/recipient; truth/fiction; life experience/aesthetic experience; real/virtual; theory/practice etc.). The expanding field of performative practices calls for new and novel approaches and concepts to describe these changes and developments which we are presently facing. The task of inventing a new language of theoretical description might seem daunting, but the anticipated gain makes the risk worth taking. This volume is an attempt to meet this challenge. However, given the multiplicity and diversity of these hybrid forms, the task of developing a single concept or methodology seems futile. Instead, we propose looking at tendencies and regularities in three interrelated thematic areas.

The first part of the volume is devoted to a problem which seems fundamental to the changes of performative arts under the influence and in productive conjunction with various sciences and technosciences. It draws on insights from a long-standing tradition of science studies, which, in recent decades demonstrated the performative characteristics of scientific endeavors from their seventeenth-century beginnings. The concept of science as a set of performative, local practices lies at the core of the contributions to this part. They all demonstrate that artistic forms do more than reflect or propagate scientific discoveries. They provide frameworks for transdisciplinary investigation and cooperative problem-solving which respond to particular social, artistic, ecological, or political needs. The hybrid performances analyzed in the second part of the volume are

focused on a more specific, yet related issue – the changes of human sensorium which in various ways merges with technological extensions and interfaces. What underlies these performances is the concept of the human cognitive apparatus as performative, an assemblage in a constant process of becoming, inseparable from the mediating machines. The third part of the volume is rooted in another critical concept of knowledge as an effect or product of local practices within epistemic communities. The texts gathered here demonstrate that contemporary performance undermines the very rudiments of Western episteme, problematizing its reliance on alterity – the exclusion of ‘others’ (colonial, political, disciplinary etc.) from the processes of knowledge-making. The performances discussed in this part create spaces in which the well-known and established re-connects with what has been ousted from the dominant epistemic paradigms in the modern period. All three parts of the book are therefore intended as diagnostic forums, in which the authors identify the most salient trends and tendencies in today’s landscape of performances. In this respect, we subscribe to the notion of performance as a methodological lens which allows one to see the processual, active, emergent phenomena which come into being as a result of productive clashes and fusions of disciplines and perspectives. In other words, refraining from any overarching synthesis and unified approaches (a task which seems unfeasible in a collective volume like this one), we have tried to look at some of today’s cultural developments to see potential beginnings of futures to come.

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Introduction

Mateusz Borowski

Two Hundred and Two Cultures

Most probably it is only today, in the midst of debates over the Anthropocene as the current geological epoch in which humans are a major geologic factor, that it has become clear what stakes are involved in bridging the gaps between the humanities, arts and sciences. Heather Davis and Etienne Turpin, the editors of the volume *Art in the Anthropocene* argue that the era of the Sixth Extinction of species and rapid climate changes calls not only for new scientific concepts and technological solutions, but most of all, for new ways of thinking “with geology and biology, with the power of imagining all that might take place” (2016: 9). The collection they edited can be seen as such a tentative attempt at bringing together discourses and practices which still remain separate in the Western culture – academic essays and interviews with renowned scholars representing various disciplines are accompanied by presentations of artistic projects addressing ecological and eco-political issues. Significantly, this book is by no means unique among the current works on the possible involvement of art in counteracting the deleterious effects of the Anthropocenic on the natural environment and in helping to forge a livable future for all earthly creatures. Similar attempts at linking scientific investigations, philosophical reflection, and artistic practice can be found in other key publications tackling issues pertaining to the Anthropocene and its discontents.

For example, the collective monograph *Arts of Living on a Damaged Planet* (2017) contains essays by scientists, historians and artists, but also opens with literary pieces and poems by the celebrated science-fiction author Ursula Le Guin. Moreover, the book itself is organized in an unconventional way, with its two parts, “Monsters” and “Ghosts,” starting on either side of the volume and converging in the middle. In the introduction, the editors explain the reasons for this monstrous, hybrid book structure without beginning or end: “It juxtaposes many genres to show how varied storytelling styles might inform each other both in learning about our challenged planet and in forging strategies for living with others in the yet-to-come” (Bubandt et al. 2017: 10). According to the editors, the artistic practices and imaginative narratives should not be treated as derivative of scientific

discoveries, but rather as creative means of meaning-making, which play a crucial role in subverting the ideologies sustaining the Anthropocenic predicament faced by humans and non-humans today. The idea of a book which includes a variety of discourses and, through its design, invites the reader to look for possible inter-connections, overtly relies on the notion of “sympoietic practices for living on a damaged planet” (ibid: 9) which Donna Haraway introduces in her contribution to the volume. She developed this concept in *Staying with the Trouble* (2016), another hybrid work which draws on insights from the humanities and arts, merging scholarly discourse with literary fiction.

Her project of connecting these various disciplines is firmly rooted in new concepts in evolutionary biology which depart from the Darwinian paradigm, premised on the modern idea of progress and competition, toward those perspectives which stress the significance of symbiosis as a critical evolutionary force. She is particularly inspired by the concept of sympoiesis, suggested by M. Beth Dempster in 1998, to describe open evolutionary systems linking various species and abiotic elements into productive relationships; systems with no spatial or temporal boundaries, controlled in a distributed manner and capable of rapid and unpredictable change (Haraway 2016: 61). According to Haraway, the theory of sympoiesis provides an alternative evolutionary narrative that puts greater emphasis on cooperativity and connectivity than on competition and specialization. As such, it replaces the idea of survival of the fittest with the notion of survival of those who are capable of forging new cross-species connections and are the most likely and willing to change. At the same time, sympoiesis is a powerful metaphor that organizes Haraway’s writing, which itself defies disciplinary boundaries and draws on insights from both arts and sciences. In *Staying with the Trouble*, scientific discourse is brought into contact with current ecopolitical issues and a science-fiction collection, *The Camille Stories*, which Haraway wrote during workshop in Cerisy in 2013. Both the shape and the argument developed in her book are intended as a hybrid discourse to supplement the Darwinian sciences, which, between 1930s and 1950s, came together in the “New Synthesis” with those approaches which emphasize the “multi-species becoming-with” that “sustain us in staying with the trouble on terra” (ibid: 63):

An emerging “New New Synthesis” – an extended synthesis – in transdisciplinary biologies and arts proposes string figures tying together human and nonhuman ecologies, evolution, development, history, affects, performances, technologies, and more. (ibid)

These few examples of scholarly attempts at synthesizing what used to be regarded as separate discourses and practices are symptomatic of today’s drive toward a transdisciplinary effort as a response to the sense of emergency instigated by the

debates around the Anthropocene. The extent and significance of these developments can be described with reference to the twentieth-century debate about need to realign the two cultures, humanities and sciences, about which C. P. Snow wrote sixty years ago (1998).

In his preface to the 1998 edition of Snow's *The Two Cultures*, originally published in 1959, literary critic Stefan Collini stresses that the concept of two cultures was born out of a political impulse to reconnect various domains of knowledge, so that they could more effectively work out solutions for the social problems of the era, particularly that of widespread poverty. Collini argued that Snow's idea managed to stir considerable debate and controversy in the early 1960s, but by 1998 it had fallen into oblivion, mainly because of the intellectual and social changes in the latter half of the century. Collini elaborates on the cultural developments which rendered Snow's concept obsolete. On the one hand, he argues, there are more and more sub-disciplines which continue to specialize, as the two empires of sciences and humanities keep splitting into smaller states. On the other hand, these sub-disciplines and new fields of study evince an interdisciplinary character and form surprising alliances across the former disciplinary divisions. Therefore, Collini concludes, "[I]t is largely a matter of emphasis whether one regards these changes as indicating that, rather than two cultures, there are in fact two hundred and two cultures or that there is fundamentally only one culture" (1998: xliv). In the same paragraph Collini hastens to add that whether we are presently dealing with a multiplicity of micro-disciplines or just one general framework for all academic endeavors depends on one's point of view. The former perspective accentuates the ways in which each professional group works out its own idiom to sustain its boundaries. The latter focuses on the largest possible common denominator that could provide common ground for bringing together the various intellectual enterprises. According to Collini, these two juxtaposed views remain in constant tension in contemporary societies, which seek to mend the gap between various domains of knowledge production.

At the time Collini was writing his essay, in the era of the "science wars" between scientific realists and postmodern relativists, the problem of disciplinary divisions and borders was particularly acute. With the benefit of hindsight, we can find particular examples of these opposing perspectives on the problem of atomization of scientific and scholarly disciplines which he addressed in the above quote. On the one hand, the multiplicity of scientific practices was, for example, addressed by Karen Knorr Cetina, who came up with the concept of epistemic cultures, each driven by a different set of rules, values and types of conduct (1999). On the other hand, in 1998, E. O. Wilson introduced his idea of consilience in an attempt to work out a unifying framework for all fields of human endeavor (1998). At a time of renewed interest in disciplinary divisions, Stephen J. Gould addressed the problem in an ingenious way, not only proposing his own way of mending the

gap between the humanities and sciences, but also critically examining the concept of the two cultures at the core of these debates. In his final work, *The Hedgehog, the Fox and the Magister's Fox* (2003), he took a closer look at the aforementioned edition of Snow's text, a bit more favorably reading *The Two Cultures: A Second Look*, published in 1963 as a response to some criticism leveled at the original essay. Gould is not only suspicious of the all-too-simple, binary division into humanities and sciences which Snow propounded. He argues that Snow also falsely identified upper-class British scholarship with a much wider community of humanists (ibid: 90–91). It was only in the later essay that Snow admitted his mistake and recognized that intellectual life develops in many directions simultaneously, even positing the existence of a third culture, of social sciences. Thus, Gould concludes, Snow's later essay suggests that there could also be a fourth or fifth culture, or more, which effectively undermines the binary model at the heart of the two-culture concept. Capitalizing on this "lesson in the fallacies and dangers of dichotomy" (ibid: 94), Gould proposes his own way of "mending the gap between science and the humanities," as the subtitle of the book announces. Himself a versatile humanist, a paleontologist, evolutionary biologist, and historian of science, well-versed in the canon of Western literature and art, he argues that the division into radically different domains of humanities and sciences, a product of post-war debates on the two cultures, was actually projected backwards onto the entire modern era. It consequently occluded the productive interconnections between them since the Scientific Revolution. Gould's book uncovers them in a series of historical investigations which come together to prove that the two-culture division is actually a short-lived phenomenon which should be done away with to end the "science wars." He speaks in favor of perspectives which enable more fruitful cooperation between scientists, historians of science, and representatives of other branches of the humanities, striving for new solutions to scientific problems and for ways of applying the knowledge produced.

In performance studies Gould finds an ally in Sue-Ellen Case, who does not refer to his work directly, but works on a similar premise. In *Performing Science and the Virtual* (2007), she also demonstrated that in the modern era, theater, in its various historical guises, was closely connected to scientific endeavors. She returns to seventeenth-century culture to show that theater and science were both born as two apparatuses with vantage points for a careful observation of a given object, whether a natural phenomenon or human behavior. Renaissance theater represented a metonymy of the world, a fragment that stood for the whole which encapsulated the general principles operating outside theater, just as laboratories, conceived at roughly the same time, gave scientists an opportunity to observe natural occurrences and describe them from an objectifying distance. Case puts forward the thesis that theater and science are not separate discourses, but rather two intertwined practices of representing human knowledge:

Science and theater offered an organization of knowing and managing as a viewing apparatus, a lens, through which the appearance of the object was translated, with the assumption that its translation would provide a more accurate vision of it. If science emulated theater, theater emulated science. (Case 2007: 13)

Case has no doubt that, at the turn of the twentieth century, theater and performance art effectively undermined the authority of science in uncovering theatricality at the heart of scientific experiments. She draws on such examples as Michael Frayn's *Copenhagen* (1999), in which theater becomes a quantum physics laboratory, or Caryl Churchill's *a number* (2002), in which the relationship between a cloned body and its identity is likened to an actor and her role. These and many other examples quoted and analyzed by Case corroborate her claim that contemporary performative arts reveal deep affinities with scientific practices. However, from the point of view of the chapters in this section, one aspect of Case's argument needs to be modified – the concept of theatricality as a feature of scientific experiments. This makes the latter a sphere of make-believe, simulations, and fictions, with little reference to the outside world. The authors of the chapters in this section discuss projects which draw a different analogy between the aesthetics and scientific experimentation – their ability to create realities, relationships, and worlds within collectives comprised of humans and non-humans, biotic, abiotic, and technological elements. In other words, the common denominator between the arts and sciences is the concept of performance as a structure of joint actions across disciplinary boundaries, which brings about emergent effects, merging knowledge production with affective impact.

Performance and Science

The concept of performance as an artistic *and* scientific endeavor also dates back to the turn of the twenty-first century. It was also at that time that idea that human knowledge was produced not by two, but by “two hundred and two cultures” was propounded by the rapidly developing sociology and history of science. Scholars working in this transdiscipline introduced and elaborated the concept of scientific knowledge as a product of culturally and historically contingent sets of practices. In her landmark study *Epistemic Cultures*, published in 1999, Karin Knorr Cetina offers an ethnographic description of two communities of scholars working in the most significant Big Sciences of our time – high particle physics (HEP) and molecular biology. At the root of her work lies a new concept of knowledge, which departs from its understanding as scientific belief, technological use, or intellectual property. She defined it as “practiced – within structures, processes and environments that make up specific scientific settings” (ibid: 8). The notion

of practice, present in science studies from the 1970s onward, emphasized contextual acts of knowledge-making in historically and culturally specific settings. It is from this point of view that the idea of science as a unified discourse seems even more misleading, because the two epistemic cultures investigated by Knorr Cetina, although both qualify as scientific, evince divergent and often opposing characteristics on various levels of their organization. In HEP, the investigated phenomena are always necessarily mediated by powerful laboratory machinery, which turns the experiment results into signs and inscriptions. Biologists in labs have more direct access to the living tissue which they subject to processing and scrutiny. Consequently, HEP experiments could not be handled by a single person and involve entire research groups of individuals who become a collective subject of knowledge. In molecular biology, it is still the individual scholar who remains the source of the knowledge produced, even if he or she relies on the help of other scientists. Knorr Cetina enumerates other significant differences in the structure of these two epistemic cultures, including the professional hierarchies, rules of conduct and the ways in which private relationships may influence the experimentation process. However, it is not only the infrastructure of research institutions and the structure of scientist communities that govern the production of physical and biological knowledge, respectively.

Knorr Cetina's study was among those written by sociologists of science who analyzed the internal workings of laboratories and the principles that regulate the relationship between a phenomenon under scrutiny and the outside world. With reference to Steven Shapin and Simon Shaffer's *Leviathan and the Air Pump* (1985), she stressed the fact that, in a laboratory, a natural phenomenon may be either staged (as in HEP experiments) or extracted from natural environment and adjusted to the needs of an experiment (as in molecular biology). These operations involve a great degree of technical manipulation and purification to assure that the phenomenon under investigation is not distorted by background interference or the accidental intervention of unpredictable factors. Knorr Cetina stresses this artifactual nature of laboratory material, she also points to its highly ambiguous, processual ontological status. Materials processed during experiments have no stable identity, they are constantly changing, decomposing, and reassembling in complex processes. Moreover, the treatment they undergo and the results obtained depend on a number of contextual factors, including the metaphorical mappings scientists use to describe the materials and equipment with which they are dealing. For example, the large and complex particle accelerators and colliders are often spoken of as animals which grow old and have particular characteristics and temperaments, and a limited life span which needs to be considered in any experiment. In a biology lab test, animals and living tissues are often treated as machines, particularly because they are mass produced (like particular lineages of mice or cancer cells) to further eliminate any accidental impact of genetic mate-

rial on the result of a test. Knorr Cetina comes to the conclusion that, despite all the clear efforts to stabilize the material under scrutiny, in a laboratory, “natural objects are treated as *processing materials* and as *transitory object-states* corresponding to no more than a temporary pause in a series of transformations. Objects are decomposable entities from which effects can be extracted through appropriate treatment” (ibid: 37).

The concept of epistemic cultures understood as regulated sets of practices which produce knowledge-effects, brings along a view of science “in the performative idiom” (ibid: 9). It emphasizes the performative character of scientific knowledge as emerging from collective interactions between human bodies, machines, biotic elements, cultural norms, and forms of social conduct. In this respect, a modern laboratory, as described by Knorr Cetina, could be counted among all those sites in which performance, as defined by Jon McKenzie, is the major organizing principle. In his seminal book *Perform or Else: From Discipline to Performance* (2001) McKenzie argues that in the late twentieth century the societies of discipline described and analyzed by Foucault (which functioned on the principle of strict submission to norms regulating life even on the micro-level of biopolitics) have turned into societies in which performance reigns supreme. Within this conceptual framework, performance is understood not only as an art form providing participants with the possibility to, albeit temporarily, subvert dominant norms or try out new identities. McKenzie calls this particular kind of collective practice cultural performance, but it is not the only one existing in late-twentieth century societies. Performativity, as he argues, has become a prime value in other spheres of late capitalist societies, namely in the sphere of management (organizational performance) and technology (technological performance). In these two areas, performance is not a subversive, but a normative and regulatory force summoning both people and machines to constant creativity – effectiveness and efficiency. In view of Knorr Cetina’s ethnography of epistemic cultures, modern sciences also perform, producing knowledge out of creative interactions of human and nonhuman assemblages.

This aspect of scientific inquiry was investigated by Bruno Latour the same year that *Epistemic Cultures* was released, in a collection of essays entitled *Pandora’s Hope* (1999). There he employs the concept of performance with reference to scientific experiments, although, in the glossary at the end of the book, the term “performance” figures only as a synonym for another term, “name of action.” His definition emphasizes yet another characteristic of the procedures employed by scientists during experiments and research – the fluidity and transitory nature of the objects under scrutiny and the entire laboratory apparatus. He defines “name of action” as follows:

An expression used to describe the strange situations – such as experiments – in which an actor emerges out of its trials. The actor does not yet have an essence. It is defined as only a list of effects – or performances – in a laboratory. Only latter does one deduce from these performances a competence, that is, a substance that explains why the actor behaves as it does. The term ‘name of action’ allows one to remember the pragmatic origin of all matters of fact. (ibid: 308)

By employing the term “actor,” Latour stresses the active role played by the elements of a laboratory set-up, emphasizing their agency in bringing about knowledge-effects. This perspective seems particularly pertinent in the discussion of today’s transdisciplinary performative forms, which no longer seem to be forms of interhuman encounter that re-establish communal bonds or prompt participants to take political action. Rather, they entangle humans with non-humans, often employing intricate technological dispositives, to create sympoietic collectives which generally negotiate new forms of livable co-existence. In the following, I would like to take a closer look at an example of such a performative form, which, though disguised as a traditional documentary, can in fact be read as a prototypical performance across disciplinary boundaries, facing the challenges of the Anthropocene.

Exercises in Intra-action – A Case Study

The example in question is and acclaimed documentary, *Chasing Ice* of 2012, directed by Jeff Orlowski. Despite the semblance of a traditional form, at closer inspection it reveals a performative streak – it is a fundamentally self-reflexive work, a documentary about another documentary project. Both these levels are significant, as they facilitate the telling of the story of wildlife photographer James Balog, who, in the early twenty-first century, began tracking glacial retreat, a phenomenon which indicates critical changes in the global environment. Balog spent several years photographing glaciers and icecaps in Greenland, Iceland, Alaska, and Montana, coming up with time-lapse presentations that visualized the pace at which ice melts and retreats. Subsequently, he toured his presentation around the world, campaigning for a heightened awareness of climate change. Orlowski, who accompanied him throughout his project, provides an account of the process of gathering evidence to support the claims that climate change is actually taking place.

The film is an excellent example of a project which joins various scientific discoveries with digital technologies to demonstrate the performative production of knowledge about natural phenomena. Climate change seems to be especially good material for demonstrating the stakes involved in transdisciplinary research. As

German social psychologist Harald Welzer argues in his *Climate Wars* (2008), climate change is a result of such a complex network of cultural, social, economic, and natural factors that it challenges the fundamental laws of causality that lie at the core of our understanding of the world. He is convinced that our steadfast reliance on causality, our belief that climate change results from a single cause or a finite set of causes, makes us incapable of taking into account the contingencies and chaos intrinsically connected with all social and natural processes. Undoubtedly, today's environmental documentaries try to face this challenge, while a number of media, film, literature, and art scholars try to chart this vast landscape of contemporary documentary forms and techniques. For example, in her relatively recent book *Green Documentary: Environmental Documentary in the 21st Century* (2014), Helen Hughes traces the trends in environmental documentaries which flourished in the early twenty-first century, in response to a host of ecological problems, particularly global warming, climate change, and massive changes in Earth's geological makeup. The novelty of these documentary forms in comparison to the earlier ones came partly from the unprecedented nature of global environmental phenomena and their entanglement with political and economic issues. Yet, as Hughes stresses in the introductory chapter, the new environmental documentary is also quite preoccupied with broadening the social awareness of the complexity of these problems by channeling non-human perspectives – i. e. by introducing points of view that emphasize the active role of non-human agents (natural and geological forces, plants, and animals, but also the media recording and reporting on them) in shaping the ecological changes on Earth. These new documentaries employ innovative strategies of addressing recipients, engaging them more effectively and imparting upon them the sense of urgency of the ecological predicament which, in one way or another, we are all soon to face. In this respect, they acquire performative features.

However, in the context of this introduction, *Chasing Ice* provides excellent material to prove that the convention of a documentary film can be employed for bringing together various disciplines and practices for interventionist purposes. The film begins with a montage of footage from a variety of media reports and interviews with experts from the early 2000s, in a period of intense weather-related disasters all around the globe. Those sudden and rapid catastrophes (floods, hurricanes or storms), so appealing to the media for their spectacular images, were often presented as harbingers of a major future collapse of Earth's ecological system. However, as Balog's project demonstrates, these catastrophes are just surface phenomena, momentary manifestations of processes occurring in deep geological time, on a temporal scale which evades human perception. Therefore, Balog's question at the beginning of the movie, "How can you photograph climate change?", sounds like a challenge to the environmental documentary. How to register a phenomenon so vast and protracted that its causes and effects cannot be

laid out and explained in a comprehensive way? In other words, how to show that what we commonly take to be harbingers of a future disaster are in fact past consequences of events on a geological scale which have been underway for decades or centuries, depending on ever-changing scientific estimates? From this point of view, Balog's project draws its rhetorical power from confounding our sense of the before and after, by skilfully using photography to mediate between human and the geological temporal scales. This effect of confusing temporalities is a means of imparting viewers with a sense of urgency of the environmental problems, to demonstrate the entanglement of humans with non-human forces beyond their control. These non-human forces are not only geological and biochemical processes, but also technologies for visualizing and conceptualizing the relationships between humans and nature.

Actually, Balog's project provides a good foundation for touching upon another topic closely connected with the problem of profound ecological and geological shifts. His question of how to photograph climate change also expresses the challenge to find media to make climate change visible. In fact, *Chasing Ice* is essentially a documentary about documenting – a film which shows not only the melting of icecaps, but also the problem of how to record it and make it available and comprehensible to wide audiences. Orłowski's film demonstrates that the whole project could only come to fruition through the cooperation of a large collective, of not only humans but also properly prepared machines. Having decided to embark on this project in cooperation with *National Geographic*, Balog realized that he needed to design and manufacture the equipment, which could autonomously produce photographs of glaciers over extended periods of time in extreme weather conditions. Therefore, an integral part of his project's story is his struggle with technology which refuses to cooperate and perform in low temperatures. In his initial design, Balog did not take into account the fact that his equipment could be attacked by endemic animals – birds which pick at solar batteries powering the cameras, or foxes which chew on cables. It was only when he introduced changes to the custom-made computers governing the cameras and provided more durable cases for the equipment that was he able to get the visual material representing the melting of the ice. It is crucial, therefore, that Balog struggled with these adversities in order to produce technology which would have the potential to record what evades the human eye. Thus, he showed that in order to register climate change one has to see it from the manifestly non-human perspective of a self-operating camera.

It is only appropriate that media scholar Joanna Zylińska opens her recent book, *Nonhuman Photography* (2016), with reference to Balog's project. She quotes it as an exemplary meditation on the changing function of photography, which has ceased to be merely a medium for representing current or past events. By analyzing a host of photographic projects (including a few of her own), she argues

for an understanding of photography as an activity which always involves creative cooperation between humans and technology. She regards photography as a process, rather than a set of objects (ibid: 4). This activity, critically shaping our understanding of the world and environment, “not only represents life but also shapes and regulates it, while also documenting or even envisioning its demise” (ibid: 2). This understanding of photography could just as well be extended onto other documentary media, facing new challenges in the age of ecological crises. Orłowski’s documentary on photography clearly shows that the process of documenting glacial retreat is such a cooperation between various agents to produce a new understanding of life forces.

In this respect, Orłowski’s film which simultaneously documents climate change and contributes to establishing it as an actual phenomenon, can be seen as yet another concept of performativity – one introduced by Karen Barad in her seminal *Meeting the Universe Halfway* (2007). This is a lengthy account of Niels Bohr’s approach to physics, which connected experimental practices and philosophical meditation on crucial ontological questions. Faced with the problems that came with quantum physics in the early twentieth century, particularly the problem of indeterminacy, Bohr proposed a radical departure from the traditional notion of the scientist’s objectivity and detachment from the observed phenomenon. Far from epistemological skepticism, he wanted to treat science as a way of producing knowledge in the interaction of matter with the human mind and various non-human elements, including the measuring apparatus. In this respect, his work went beyond the bounds of the hard sciences, and is analyzed by Barad as a new philosophy which draws conclusions from the new scientific discoveries of its era. She reconstructs these forgotten aspects of Bohr’s work only to develop her own understanding of scientific practices, calling them performative in a strictly defined sense: “[T]hey challenge the representational belief in the power of words to represent pre-existing things [...] [A] performative account insists on understanding thinking, observing, and theorizing as practices of engagement with, and as part of, the world in which we have our being” (ibid: 133). It is this creative engagement with materiality of the world which lies at the core of scientific practices and gives rise to the investigated phenomenon as the “specific intra-action of an ‘object’ and ‘measuring agencies’” (ibid: 128).

In other words, Barad tries to step over another line which has existed in Western thought since time immemorial – between ontology and epistemology. Turning to Bohr’s philosophy, she tries to approach the question of indeterminacy differently, by undermining the assumption that the measuring apparatus merely registers natural and objectively existing phenomena. As she argues with reference to a number of canonical experiments in quantum physics, this field of studies asks us to finally recognize that measuring is so entangled with the phenomenon under scrutiny that it should be regarded as constitutive of this phenomenon.

In other words, any type of observation regarded as a local and material practice contributes to the creation of what is observed. Obviously, this subversion of the fundamental tenet of Western science leads to a reformulation of its role as a knowledge-making discourse. It should be regarded as a set of world-making procedures which performatively produce multiple experiential connections with phenomena being described.

Chapter Overview

The various concepts of performance and performativity quoted above provide a conceptual framework for all three chapters in this part of our book. They are focused on examples of variously defined performances which serve as a common ground for scientific ideas, technological advancements, and aesthetics to converge. Each of these encounters has a different structure and purpose, but they all create collectives of humans and non-humans which performatively bring about the desired effects – technological solutions to practical problems, ways of producing knowledge or new concepts, points of view and affects. In all these instances, performance proves a framework for such transdisciplinary investigations.

Drawing on a rich tradition of studies on laboratory life, Jussi Parikka takes a closer look at a few contemporary examples of performative projects which extend and modify the concept of the laboratory as space of experimentation and knowledge-making. In Parikka's examples, the laboratory provides a context for transdisciplinary research outside of typical institutional structures and is therefore open to a variety of discourses and disciplines. It is instrumental in bringing them together as a systemic part of the infrastructure across art and academia. The laboratory is a particularly good structure for practice-led research in the uncharted territory of media studies, which investigates the relationships between communication technologies and human bodies, affects and cognition. In his discussion of the activities and infrastructure of ACTLab and other modern media research institutes, he concludes that they are critical sites not only for producing knowledge and technological solutions to particular problems, but also conceptual frameworks for the understanding of today's rapid cultural changes.

In a similar vein, though from a markedly different perspective, Izabella Pluta discusses the relationship between technosciences and contemporary performative practices. Her text is an extensive report on the "Masque et Avatar" project, which gathered theater practitioners and computer programmers to collaborate on technology which could combine live-action theater with virtual simulation. The consecutive stages of the project provide an excellent example of how new theater technologies and performative forms emerge from the cooperation of humans and machinery. However, an equally significant actor in this experimen-

tal setup is the historical tradition of *commedia dell'arte*, which, to a large extent, affected the outcome of the designers' and programmers' work. This was not all the project's practical significance. By matching a historical form of theater with cutting-edge technology, it also provided ample material for theoretical investigation into the relationship between the acting human body and its virtual doubles.

Mateusz Borowski's chapter moves into the realm of new performative forms, particularly "live art," which draws upon concepts from biology and other life sciences. He analyzes three projects which start from scientific discoveries to create speculative, alternative worlds for the participants. In the manner of science-fiction novels, the three installations demonstrate possible distant futures of life on Earth. Borowski reads these performances as responses to current debates on the need to redefine the modern concept of life, not only in view of contemporary environmental problems, but also the emergence of technologies which imitate organic processes. These performative forms become sites in which various concepts of life materialize for the participants, inviting them to acts of collective knowledge-making.

All three contributions, despite their differences in approach and the material they analyze, identify similar attempts in the expanding field of performative forms which defy the traditional division into aesthetic experimentation, political intervention, and scientific research. These three chapters support the claim that today's performative arts go hand-in-hand with the scholarly attempts to bridge the gap between various disciplines inherited from the modern era. Today's trans-disciplinary performances provide multiple frameworks for staging sympoietic encounters between scholarly and artistic idioms, and academic experts, activists, and audiences, to work out solutions to practical problems and collectively look for possible livable futures.

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