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STRATA: The Research Process in the Making of a Performance-Based Film

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Résumé de l'article

Does a performance-based film as a creative artifact contribute new knowledge on the topics it adresses partly through its practice and outcomes? The focus of this article is on the performance-based film project STRATA. Under the direction of artist duo Verena Stenke and Andrea Pagnes (VestAndPage), STRATA brings together artists, performers, scholars, and researchers from the humanities and social sciences through collaborations and interdisciplinary processes. Locations featured in the film include the Swabian Jura caves in Germany, which were used for shelter by Ice Age humans forty thousand years ago. VestAndPage intend to open up a contemporary discourse on the past by engaging performing artists as they confront the concept of deep time and layers of memory in human history. They investigate the human body as a site that exists in continuity with the geological, rather than cut away from it, undertaking site-specific/site-responsive performances within caves and grottos. Working from the a priori assumption that everything in the world is interconnected and coexists with its environment, they take ecological thinking as an entry point to enliven an emerging corporeal epistemology to inform a more holistic and multicultural perspective. In the article, the authors attempt to trace continuities between their research activity on performance, filmmaking, sound and light design practices, and the methodological differences between practice-based research in moving images and academic research in film and image studies. They recount the evolution of their thinking, sensations experienced, practice-based artistic research, and working methods, which draw largely upon phenomenology and heuristic processes.

STRATA: The Research Process in the Making of a Performance-Based Film

Andrea Pagnes, Verena Stenke, Douglas Quin, and daz disley

1. Introduction

On the threshold of beauty, science and art collaborate.
—Edgar Varèse (1967, 196)

STRATA is our fifth performance-based film project and deals with the concept of deep time, the formation of layers in human history, memory, and the geological.[1] After three years of preparations, sudden delays, and waiting due to the pandemic, we started filming in spring 2021 in the caves of the Swabian Jura in Germany. Lockdown and the regulations for COVID-19 were still in force, making the production more complex than expected, but it could not have been otherwise.

Deep time is a profoundly different time scale in geological and evolutionary processes than that with which we deal in our daily lives. John McPhee introduced the term "deep time" (1981, 20) to the modern philosophical concept of geological time developed in the eighteenth century by Scottish geologist James Hutton (1726-1797),[2] regarded as the father of modern geology. Observing sequences of formations from rocks cut across and intruding on each other, Hutton recognized an ancient Earth with "no vestige of a beginning, no prospect of an end" in these unconformities (Baxter 2004, 231). Earth's landscapes are shaped through long-lasting processes of cyclical counterforces: erosion, deposition, consolidation, and uplift. For Hutton, over longer time scales, nothing is constant: "We are as lost in time as in Copernicus's space" (Baxter 2004, 231).

Our idea to make a performance-based film on deep time stemmed from the results of research funded by the British Arts and Humanities Research Council, conducted by the network Rock/Body: Performative Interfaces (University of Exeter, UK), and consisting of a series of seminars organized by human geographer and anthropologist Nigel Clark and art historian João Florêncio. We were invited to participate along with a number of other scholars, including Timothy Morton. The core idea of the seminars was that the Anthropocene prompts us to see human beings as geological agents. The focus was on the human body and its relationship to the ecological, the effects and consequences of human dependency, and the use of geologic framing. The aim was to shed light on how we understand social life as shaped and perturbed by physical forces, and whether geological *strata* (natural formations) and layers resulting from human endeavour are similar to structures of memory—the process of storing and retrieving information.

Venetian-born artist and performer **Andrea Pagnes** and German artist **Verena Stenke** have been working together as VestAndPage since 2006, exploring performance art and filmmaking as phenomena of thin places through their collaborative practice, artistic research, and curatorial projects. They are founders and curators of the Venice International Performance Art Week and currently serve as lecturers at ArtEZ University of the Arts (NL) and Unidee Academy (IT). **Douglas Quin** is a music composer, sound artist, and film sound designer whose works have been performed internationally. The recipient of numerous commissions and awards, Quin is professor emeritus at the S.I. Newhouse School of Public Communications at Syracuse University. **daz disley** is a UK-based artist with a background in sound, music, light, and technology. His current research interests are in the domain of audio software and platforms. disley is module leader in the Home of Performance Practices Department at ArtEZ University of the Arts (NL).

Considering how the exploitation of natural resources is legitimized on a global scale, at the expense of life on the planet, the seminars provided a forum for reflection to consider the socio-political and ontological concerns about humankind's presence and indeed survival on Earth. Deep time emerged as a main topic. The idea that deep time transcends hegemonic modes of perceiving and marking time gave us the impetus to think of a performance-based film—to glimpse, at least ideally, its contours and the possible convergence of artistic and scientific comprehension. From the outset, it meant approaching this daunting prospect through a work of imagination—an abstract entity, never-ending, continually growing, perhaps a thing (not an object) of any form. Thus, we were venturing into a conceptual terrain full of pitfalls to arrive at a performative outcome.

To imagine travelling back through the eons of time is to feel a vertiginous beauty that one cannot hold. "Beauty is nonconceptual. Nothing in the object directly explains it" (Morton 2013b, 208). Beauty, as Kant (2000) expressed, precedes cognition. Hence, reproducing perceptual beauty through performance-based filmmaking, imagining going back through time, is very subjective. One has to access one's critical memory. One has to outsource and compare different kinds of representations of beauty one's memory has stored over time and reshape them for the purpose. It is an action of "transcendental reflection" (Kant 1998, 367) to inspire the artistic practice. It involves critically examining the assumptions that inform knowledge and understanding their limits, thus learning from one's experiences in order to perform. At the same time, it is an opportunity to explore the complex relationship between performance art and reality and how performance art can challenge dominant discourses and expose the constructedness of reality (Diamond 1997).

My partner in art and life is German artist Verena Stenke, and we have been working together under the acronym VestAndPage since 2006. Whether we perform live or create films, we question how we can make our perception of time tangible by reflecting on the artistic processes we undertake to produce a work. Our creative practice is contextual and situation-responsive, conceived psychogeographically in response to social contexts, natural surroundings, historic sites, urban ruins, and architectures. In a "Poetic of Relations" (Stenke and Pagnes 2020), we examine notions of temporalities, memory *strata* (formation) and communication, as well as the fragility of the individual and the collective within social and environmental spheres. When we perform site-specific work, we are aware that our actions, even though minimal, impact the environment. Therefore, we must consider the consequences of our artistic choices and strive toward wise and responsible relationships with all living beings and natural systems. It means caring for the opaque, the invisible, the unknown, the complex, the unexpected, and the variable. Most problems find their origins within relationships, but relationships are where conflicts can be solved; hence, we must always make connections. In that, we consider performance a tool to search for ways to inspire a sense of connectivity with oneself, one another, and the reality outside, disorienting as it may be. "To join the dots and see that everything is interconnected. This is the ecological thought. And the more we consider it, the more our world opens up" (Morton 2010, 1).

We previously partnered with scientists, philosophers, and sociologists for our film trilogy *sin∞fin The Movie* (2010-2012). We learned that art and science follow their respective trajectories but can open unexpected scenarios once they entangle and engage. As artists and performers, we deem it essential to attempt to give artistic and/or narrative forms to our lived experiences and the philosophical theories we explore. We aim to raise meanings that take shape in living and moving images. We try to transpose them to the limits of artistic representation, respecting the epistemic potential of such experiences and ideas under certain aesthetic conditions. We do not seek to solve a formal identity between lived experiences, theoretical concepts, and representational forms but rather to find an aesthetic-epistemic logic of those same ideas through the use of art

processes. It is like perceiving the beauty of something elusive to define and difficult to explain rationally yet clearly felt with affective resonance.

2. A Film Project

By Andrea Pagnes (VestAndPage)

The film *STRATA* is the result of an interdisciplinary project that Verena Stenke and I have conceived to investigate the human body as a site that exists in continuity with the formation of geological layers. To do so, we invited performing artists, vocal performers, musicians, and sound and light designers to meet with archaeologists, speleologists, cultural scientists, and time psychologists to seek convergences between art and the human sciences.

The film production sites are the Swabian Jura caves in Baden-Württemberg, located in southwest Germany. Our Ice Age ancestors used them as shelters about forty-three to thirty-three thousand years ago. Some of the first handcrafted flutes, small ivory figurines representing a waterbird, a horse and a mammoth, the Venus of Hole Fels, and the therianthrope figurine of the Löwenmensch (Lionhuman) of Hohlenstein-Stadel have been found in these sites.

Therianthropy refers to the mythological ability to shapeshift from the human form into an animal. In the film, together with the Lionhuman, we animate a series of therianthropes, interpreting them as fantastical creatures that inhabit liminal spaces, thin places, chiasmic intersections where the invisible intertwines with the visible and "every relation with being is simultaneously a taking and a being taken" (Merleau-Ponty 1968, 266).

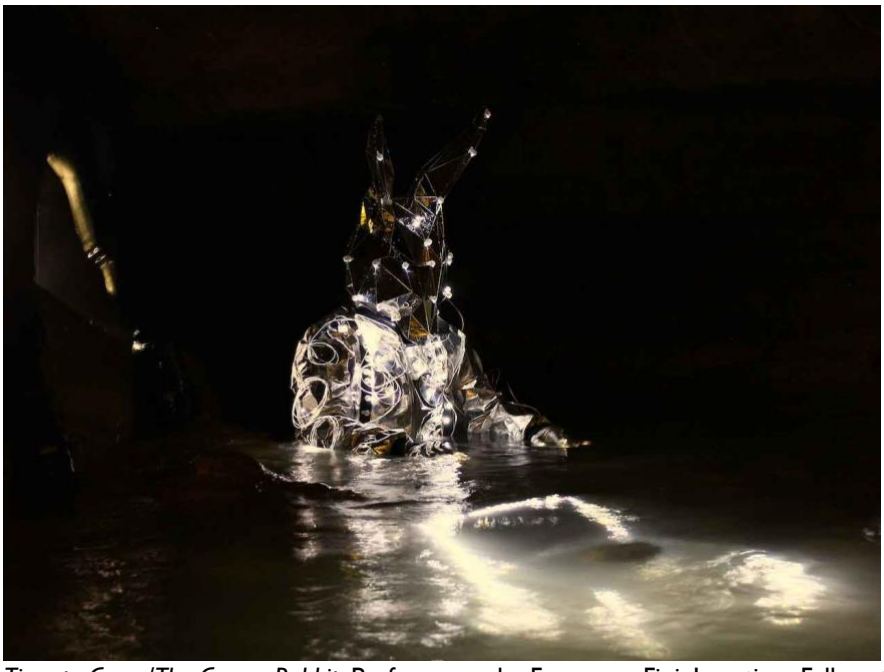
We performed them as proto-mythological, imaginary characters constantly transitioning between two worlds, as if belonging to an elusive cosmic time. Some were developed from the figurines found in the Swabian Jura caves, like the Lionhuman and the Waterbird. The enigmatic painting of the Cave of the Trois-Frères in France inspired the character of the Sorcerer. The White Crow and the Cosmo Rabbit are from our imagination.

Seven Rock Bladelet Cuts/The Lionhuman. Performance by Andrea Pagnes (VestAndPage). Filmed by Verena Stenke (VestAndPage). Location: Hohlenstein-Stadel Cave. Photo: Marcel Sparmann, 2021.

Dive-in/The Woman Waterbird (White). Performance by Marianna Andrigo. Location: Blautopf spring. Film still, 2021.

Marking Time/The Sorcerer. Verena Stenke (VestAndPage) is preparing Nicola Fornoni to perform as the Sorcerer. Location: Hohlenstein-Stadel Cave. Photo: Marcel Sparmann, 2021.

Marking Time/The White Crow and the Sorcerer. Performance by Verena Stenke (VestAndPage) and Nicola Fornoni. Location: Hohlenstein-Stadel Cave. Photo: Marcel Sparmann, 2021.



Time to Come/The Cosmo Rabbit. Performance by Francesca Fini. Location: Falkensteiner Cave. Film still, 2021.

The findings in the caves of the Swabian Jura have led to the hypothesis that the caves are not places of illusions, inhabited by shadows of forms of the things that make up the world, as Plato (2007) imagined. Instead, they are the places where the first anatomically modern humans developed the concepts of image and reality, operating as artists that sculpt and paint what they perceived as energy and vibration of what animates the visual matrix of reality (Demuth 2022). In Plato's allegory of the cave, "the prisoner-philosopher is guided by sight, breaks free and discovers true reality in the light of the sun. But what he fails to realise is that this great projector in heaven is the prototype (and the archetype) of the cave's fire which also projects light and forms a reality on earth. The pure forms are still forms, and the realm of ideas is another screen" (Vudka, forthcoming).

These ideas have been highlighted by several prehistory archaeologists we interviewed, including Nicholas Conard, whose team found the figurine of the Venus of Hohle Fels, considered to be the most ancient undisputed sculptural example of artistic depiction of a human being, in 2008; Kurt Wehrberger, former codirector of the Museum Ulm and curator of its Archaeological Collection, which hosts the zoomorphic Lionhuman figurine; and Stefanie Kölbl, director of the Prehistoric Museum of Blaubeuren, where the Venus of Hohle Fels and the waterbird are displayed.

Kurt Wehrberger with the Lionhuman ivory figurine. *On Scars and Myths: A Conversation*. Museum Ulm (DE). The *STRATA* Knowledge Archive. Interview still. © VestAndPage, 2021.

Stefanie Kölbl with prehistoric Venus ivory figurines. *On Death and Rebirth: A Conversation.* Prehistoric Museum of Blaubeuren (DE). Interview still. The *STRATA* Knowledge Archive. © VestAndPage, 2021.

During the preliminary stage of our research and the preparatory phase of the film, we interviewed them and other archaeologists, including Guido Bataille, Johannes Wiedmann, Rudolf Walter, cultural scientist Barbara Spreer, and art historian and philosopher Bernhard Stumpfhaus, to shed light on the questions we had. Can the divide between nature and culture be overcome by viewing the human body as an expression of geological matter and as a site of exposure and response to changes in the dynamics of Earth's systems? Can art make visible the sediments in the depths of humankind, the history of our planet, society, and the human psyche? Could the encounter between art and science shift the anthropocentric thinking driven by capitalist imperatives into a post-anthropocentric view: to soothe the wounds of our bleeding, haemorrhaging reality?

Housed in the *STRATA* Knowledge Archive [3] (a section of the film *STRATA* website), these conversations raise awareness of our geological past. They discuss progress through the lens of cultural exchange and cooperation. They analyze the growing complexity of social systems and

their evolutionary consequence, sharing the necessity of a more holistic approach to life, in order to recover a harmonious coexistence between humans and nature.

Eventually, they inspired Stenke and me to imagine a film under a new poetic gaze: one wherein performing within nature, as part of nature rather than apart from nature, is a way to experience the world anew, with heightened, empathetic sensitivity to beauty and emotion. A method of looking at human existence to capture its deeper meanings and cultivate a greater sense of connection: the essence of things, rather than simply their surface appearance.

Deep time is a highly complex thing. In archaeology, the geological time scale is not considered to be strictly linear but rather a sequence of different periods characterized by various geological and biological events. While there is a general progression of time, with older periods occurring before more recent ones, the actual timeline made visible is often more complex. It can be affected by a range of factors, such as the formation, sedimentation and erosion of rock layers, uplift, volcanic activity, and changes in climate and sea level.

Archaeologists use the geological time scale as a framework for understanding the chronology of human history and prehistory. They also rely on other methods, such as radiocarbon dating, dendrochronology, and stratigraphy, to refine and confirm the dates of specific archaeological sites and artifacts. Ultimately, the goal is to create a more accurate picture of the past, considering geological and cultural factors.

In explaining deep time, archaeologists echo theoretical physicist Carlo Rovelli's position that time itself is not so much a fundamental structure of the world but something that is born stratified, to be understood little by little considering gravity, heat, and entropy. Its direction is unstable: "It is neither absolute nor uniform, nor is it fixed: it flexes, stretches, and jostles" (2018, 50). Deep time is part of a complexity from which we emerge as human beings—animals who live in time, pieces of the world. It is also a way of thinking about our planet. For Rovelli, we live inside time in some way as we are inside nature; the more we understand nature, the more we understand how much we are inside it (2023).

However, translating these concepts into performative actions conducted in exceptional natural environments presents significant problems. There is always the risk of inevitably putting one's presence before nature, using the environment, even involuntarily, as a scenographic background. Indeed, when we perform site-specifically for our films in extraordinary natural locations, we feel that our sense of mystery and wonder is renewed and our imagination enlivened. However, it is not enough to project concepts we confront into an artistic medium like performance-based filmmaking, nor to restore universal or abstract ideas of beauty and specks of beauty we perceive subjectively through constructed moving images.

In other words, to attempt to engage with the geological and the notion of deep time through performance-making is not only to venture inside remote caves and perform site-responsive actions that require significant physical and psychological training and logistical preparation. It is also to acquaint oneself with the literature of geology and time theory in order to understand which trajectory to take and the range of formal outcomes that are possible.

Stenke and I practised mindfulness to stay present in challenging environmental situations, relaxation techniques such as deep breathing, meditation, and progressive muscle relaxation to help calm the mind and heat the body at low temperatures. Over a period of five years, we repeatedly visited the caves we had chosen as locations to shoot the film, mapping their rocky formations and rough structures in as much detail as possible to access them more efficiently.

In addition, still being in the preliminary stages of our research, we sought authors who examined how the formation of layers in human history present similarities with the formation of geological strata, including Lewis Morgan. In his book *Ancient Society*, he theorizes that human societies have developed from the earliest communal groups in ancient times to more advanced forms of social organization through a process of cultural evolution. They have built upon each other over time, similar to the formation of geological strata, resulting in distinct periods of history (ages, eras, or epochs) reflecting different levels of technological, economic, social, and political development (1985).

Questioning if the formation of geological stratifications may be compared to how the human brain stores memories in its complex network of interconnected neurons functioning to encode, consolidate, and retrieve information, we found the theory by Nicholas Steno, whose *Prodromus* (1669) is considered a foundational study in the geological literature, to be very informative. Steno posited that formations of rock layers are superimposed and arranged in a time sequence: "Different solids contained within a solid" (Winter 1916, 209).

Thus, we imagined our solid human bodies contained within the solid earth—our flesh, bones, and skin as geological layers themselves, and the fragmented beauty of the violated landscapes residing in our memories as insects of time. We performed within the subterranean, winding conduits of the Gustav-Jakob Cave, crawling as if dancing through narrow passages not even half a meter wide, formed of superimposed rock stratifications from oldest to youngest: our bodies fractal expressions of deep time.

Rock/Body. Performance by Fenia Kotsopoulou, Marcel Sparmann, and Sara Simeoni. Location: Gustav-Jakob Cave. Photo: daz disley, 2021.

We descended to the bottom of the slippery, dark funnel of Schiller Cave, a sight to behold, with its unique geological features, its cold mud enveloping us up to our knees, giving us the sensation of making us sink into its core.[4]

Spiralling Time/Ammonite. Performance by Giorgia de Santi. Location: Schiller Cave. Photo: Marcel Sparmann, 2021.

We repeatedly went upriver for Falkensteiner Cave's clear, gelid waters, which gush out from syphons narrow as gullets, wading where the walls of the gorge force you to pass from one bank or shoal to another, striving to maintain our balance on their slippery surfaces.

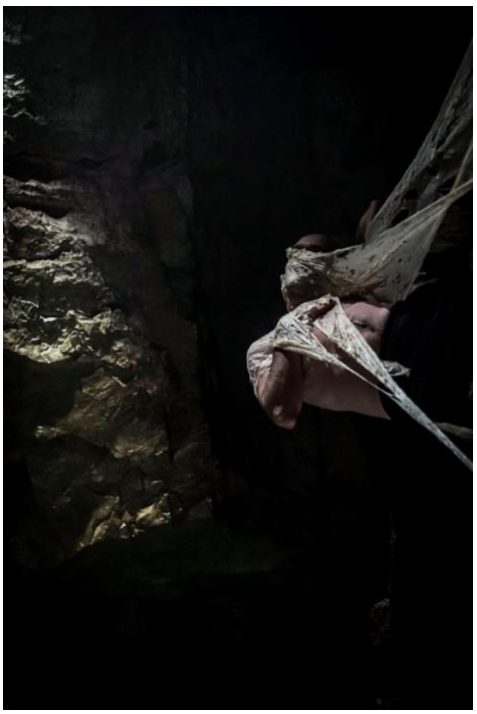
The Walk. Performance by Sara Simeoni. Location: Falkensteiner Cave. Photo: daz disley, 2021.

We undertook performative actions in an attempt to integrate our bodies or parts of them with the particular geological conformations that we gradually discovered going deeper into the caves, at times embracing each other to try and become one with the rocks which supported our precarious equilibrium.

Rocks/Venuses. Performance by Fenia Kotsopoulou and Verena Stenke (VestAndPage). Location: Falkensteiner Cave. Photo: Marcel Sparmann, 2021.

Whether Steno's law of superimposition of geological strata could apply to human memory formation is difficult to ascertain. It is speculative but evolved as an operative metaphor for exploring performative possibilities. What also hindered our thinking was how to combine it with Hutton's breath-stopping view of deep time. Could our finite, fragile bodies dwell inside the enduring vastness of the geological? How could we perform deep time as a concept, a category, or a measure of duration without a beginning or end?[5]

Performance is ephemeral in nature, therefore contradicting Hutton's idea that deep time is like an entity *ad infinitum*. We had the feeling of embarking on a nonviable journey—erratic motes striving to illustrate with our bodies a dynamic living tension with a dimension of time we cannot grasp, micro-organic vessels adrift in the infinite sea of a time scale whose traces dwell in the geological strata of deep dark caves, cosmic accidents of an intricate evolutionary process.



Rock/Body Entanglement. Performance by Marcel Sparmann. Location: Falkensteiner Cave. Photo: Fenia Kotsopoulou, 2021.

3. The Ecological Thinking in *STRATA*

Can the human body become an expression of geological matter and a site of exposure in response to changes in the dynamics of time and Earth systems? Can performance-based filmmaking attempt to move beyond the nature/culture divide?

STRATA's opening moves are that art-making processes can function as harbingers of possible changes, that ecological thinking is essential to understanding human existence, and that plurality, the nonbinary, and inclusiveness of diversity are fundamental prerequisites for social development. Ecology, mobilized in the making of the film as a research tool for understanding interactions between concrete entities, grounds the embodied performances in underground landscapes shaped by cold, muddy waters and wet, slippery rocks; the bodily self is thus a part of the *oîkos*, or "house," at the root of the term *ecology*.

From these perspectives, the film also attempts to emphasize the need to recognize the interconnectedness of all beings in the world, the impact that our human actions have on the environment, and the agency and value of nonhuman beings for a more holistic, integrated approach and a more ethical, sustainable relationship with the environment. In the conversations housed in the *STRATA* Knowledge Archive, we emphasized the need to consider social, cultural, and political dimensions of ecological challenges. We, humans, are not separate from nature but deeply embedded in the web of life (Capra 1997).

To explore the intersection of processes of embodied cognition, performance practice, environmental philosophy, and ecological thinking, we also drew inspiration from Lorraine Code. Her works have contributed to feminist epistemology and the development of environmental philosophy. Considering the ethical and political dimensions of environmental issues, Code argues that ecological thinking requires a shift away from dualistic thinking that separates humans from nature. She stresses the importance of acknowledging not a monolithic truth but rather diverse ways of knowing and being and of engaging in collaborative and democratic processes to address environmental challenges: "Ecological thinking is not simply thinking about ecology or the environment. It is about imagining, crafting, articulating, and endeavouring to enact principles of ideal cohabitation" (2006, 24).

Additionally, we looked at anthropologist and critical theorist Elizabeth Povinelli, whose work engages with questions of power, inequality, and social justice concerning environmental issues. Her concept of ecological thinking highlights the complexity of social, economic, and political forces that intersect with the natural world. In her essay "Do Rocks Listen?" (1995), Povinelli argues that ecological thinking requires us to acknowledge how colonialism and capitalism have shaped our relationships with the environment. Calling for strategies to address power structures, she foregrounds the experiences and perspectives of marginalized groups often disproportionately impacted by environmental degradation and climate change (2016).

Feminist and postcolonial perspectives on understanding the relationship between mimesis, power, and identity can offer essential insights into how art and literature can challenge dominant discourses. They can also provide alternative modes of representation (Diamond, 1997).

Anguezomo Mba Bikoro, the French-Gabonese performer who participated in *STRATA*, considers performing to be a means to take back or re-member distant moments in time. This helps to heal the present, which may in turn help subvert dominant patriarchal discourses. Indeed, honouring or criticizing what preceded us through performance serves to not forget about ourselves and what has existed and will exist without us.[6]

Disentanglement. Ritual performance by Anguezomo Mba Bikoro. Location: Bärenhöhle Cave (The Bears Cave). Photo: Marcel Sparmann, 2021.

The River of the Ancestors. Ritual performance and floating installation by Anguezomo Mba Bikoro. Location: Wimsener Cave. Photo: Marcel Sparmann, 2021.

How to Survive the Apocalypse? Ritual performance by Saúl Garcia-López. Film still, 2021.

In *Ecology without Nature* (2007), Timothy Morton criticizes authoritarian politics and calls for a new way of thinking about our relationship to the environment, advocating for a philosophy of symbiosis rather than dominance. Morton (2016) suggests we must embrace nature's dark and unpredictable aspects rather than control or tame them. This radical rethinking of ecology encourages us to think in new and more nuanced ways about our relationship with the natural world. Reflecting on the importance of interconnectedness, inherence, and relationality in ecological thinking paves the way to move beyond a dualistic view of humans and nature as separate entities, for we are deeply intertwined with the environment and dependent on its health and well-being.

Morton analyzes how poets and philosophers of the Romantic period, particularly Schelling and Hegel in Germany, and Coleridge and Wordsworth in England, had insights into ecology long before it became a scientific discipline wishing "for reconciliation of subject and object" (2007, 22). However, in learning about the history of the caves of the Swabian Jura, we could not help but encounter once more how German Romantic writers and artists often depicted nature as a pristine wilderness, disconnected from human society and untouched by civilization's negative impacts, disregarding nature's practical and material aspects. With an emphasis on individualism, inwardness, the sublime and an idealized view of nature, they were celebrating the grandeur of the natural world while at the same time perpetuating an unrealistic understanding of the relationship between humans and nature: an alienation leading to significant cultural and environmental consequences and social implications (Stone 2014).

Thus, *STRATA*, in both method and outcomes, also embodies a critical stance with respect to German Romanticism's distorted images, nationalist dogmatic beliefs, codified narratives, and aesthetics presupposing the superiority of the Aryan race and man over nature.[7]

4. Approaching (Deep) Time to Perform

Do we exist in time, or does time exist in us? The nature of time is perhaps the greatest remaining mystery. Ultimately, perhaps, more about ourselves than about the cosmos.
—Carlo Rovelli (2018)

By combining performance art and filmmaking, Stenke and I question our perceptive processing of reality, the experiences we make, and how we organize and store information in our memory

and bodies. It is a process that presents gaps, paradoxes, and ambiguities but leaves room for the imagination.

To perform the idea of deep time, we are faced with the difficulty of our human brain grasping a concept of time based on the entire geologic history of our planet, spanning over billions of years, or, as in Hutton, a time without beginning or end. We wondered if we could imagine the impossible scale of deep time as a poetic, imaginary time—time of the imagination, "not the kind of time we normally experience. But in a sense, just as real as what we call real time" (Hawking 1996).[8]

Yet how could we, through performance, hope to retrace the vestiges of a very distant past that we cannot hold? We attempted to imagine a nonlinear time that might contain fragments of real time. We thought of a mythic dimension of time, where to perform inside it involved embodying imaginary characters inspired by the therianthrope figurines found in the Swabian Jura caves.

Imagination can help to build new myths, although mythic time lacks historical perspective and is not concerned with a linear development of time. By imagining, however, our minds can wander outside the box to create without constraints. "Imagination embraces the entire world" (Einstein 2009, 97) and holds its image to generate new ones. Imagination is esemplastic: a unifying, intuitive "living power and prime agent of all human perception, and as a repetition in the finite mind of the eternal act of creation in the infinite. It dissolves, diffuses, dissipates, to re-create and unify" (Coleridge 2014, 205-206), moulding everything into one. It lets us tap into the collective unconscious (Jung 1981) and connect with more profound aspects of ourselves to push boundaries and challenge the *status quo*. By imagining, we have the opportunity to form new meanings and metaphors. "Where reason analyses and reduces into parts, imagination takes us to the hidden metaphysical unity behind multiplicity" (Kahn 2015, 1).

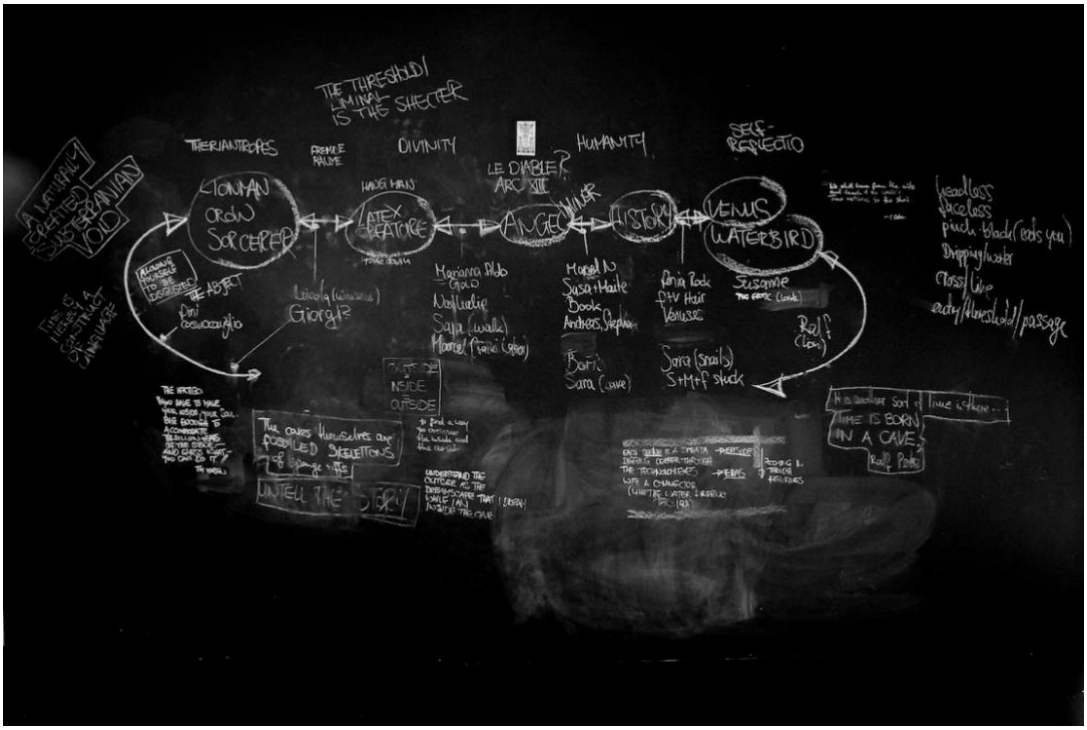
For *STRATA*, we look at myth-making as a possibility to make the unknown and the invisible elusively visible by filmmaking and as a way to unlock inherent truths to comprehend the world around us while thinking of new ones (Mosley 2020). Performing and shooting scenes inside the caves every day for more than three months was like performing a rite of passage in repetition.[9] Crossing the threshold of a cave and entering its dark womb, we were separating from the real world with its ordinary time. Performing inside the caves, our bodies were as if sucked into its million-year-old rocky formation, risk-taking and struggling to aggregate with it.

The structure underlying our constant going in and out of the caves was similar to that of the monomyth (the literary "journey of the hero/heroine") and its three main stages: departure, initiation, and return (Campbell 2004). In our case, they consisted of departure/separation from the ordinary outside, descent into the cave's darkness to perform, and return to the earth's surface. Of course, we did not perform "heroic" deeds inside the caves. We went there to understand if the transient immediacy of performance-making allows us to become part of those underground landscapes for a fleeting moment in the chasm of deep time. In so doing, did we anthropomorphize their natural structures? Honestly, this question still lingers: performing in places where contemporary humans cannot live and have no reason to dwell can only accentuate our doubts. Although seeking to develop a holistic understanding of the concept of deep time through our performance practice-based research, I personally found it challenging to overcome assumptions derived from my Catholic cultural background and education.[10] For Catholics, time is a straight line that traces the path of humanity from the initial fall, a brief life of labour and suffering, to final redemption. Yet time is also an extension of the soul in a succession of psychic states through memory and anticipation: "For a fraction of time, the soul may grasp the splendour of a constant eternity" (Augustine 2008, 228).

Seeking Time/The Miner. Performance by Andrea Pagnes (VestAndPage). Location: Schiller Cave. Photo: Marcel Sparmann, 2021.

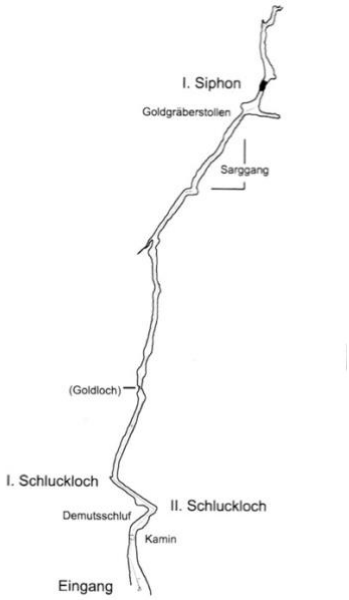
Seeking Time/The Miner. Performance by Andrea Pagnes (VestAndPage). Location: Falkensteiner Cave. Film still, 2021.

The spoken words in the film never mention the word "cave." The characters we embodied in the performances teeter between the visionary and geological formations. The caves are the tiered cosmos, and a world where they try to imagine alternative realities while mapping impossible ones through performances for the camera. Through our mapping, "we realize that nonhuman entities exist that are incomparably more vast and powerful than we are, and that our reality is caught in them. What things are and how they seem, and how we know them, is full of gaps, yet vividly real. Real entities contain time and space, exhibiting nonlocal effects and other interobjective phenomena, writing us into their histories" (Morton 2013a, 130).



Verena Stenke (VestAndPage). Sketch for the film editing. VestAndPage's studio wall. Image courtesy of the artist, 2021.

Verena Stenke (VestAndPage). Sketch of the Falkensteiner Cave map. Image courtesy of the artist, 2022.



Map. The section Falkensteiner Cave where we filmed. Image courtesy of Arge Grabenstetten, 2021.

Enok Ripley. *Skin-tracing the Cave*. Hand poke tattoo of the Falkensteiner Cave map on Andrea Pagnes's (VestAndPage) back. Film still, 2021.

Morton writes that the more we discover about evolution, the more we realize that our entire being is caught in this vast interconnectedness of relationships of all things in the world, including humans, animals, plants, and non-living entities like rocks and geological formations. The idea extends to the ineffable, like global warming. In this regard, Morton "invented a word to describe all kinds of things that you can study and think about and compute, but that are not so easy to see directly: *hyperobjects*" (2015).[11] This pervasive "meshwork" of hyperobjects is a force "vivid and often painful, yet they carry with them a trace of unreality" (2013a, 28).

This trace of unreality reminds me of McTaggart's (1908) idea that time is an illusion and that the common-sense perception of time as a sequence of past, present, and future is fundamentally flawed: a subjective experience that arises from our limited perspective. Does it mean that our memory is also limited, containing just illusion?

According to Morton, if our memories are caught in the mesh as is our being, shaped by our relationships to all living and nonhuman entities that dwell in the universe, they are not just individual phenomena. They are influenced by and connected to the broader context in which we live and the hyperobjects that contain us. For Morton, "the time of hyperobjects is a time of

sincerity: a time in which it is impossible to achieve a final distance toward the world. . . . Coexistence is in our face: it is our face" (2013a, 130).

Indeed, Timothy Morton has been highly inspirational to the film project. In an email exchange, I asked if comparing geological strata to an ideal Earth's sedimented memory, which is how Earth itself reveals its history to us humans, can be considered a sort of hyperobject. And, if so, whether our memory is a hyperobject formed by the relation and coalescence of memories (personal/experiential memories, genetic memories, and collective memories) that settle and merge upon specific stimulation, be they rational or sensory or both—a process of sedimentation forming an archive of information about the evolution of humankind, but still hard to decipher. Morton answered affirmatively to both questions, citing the memory theory of Karl Pribram (1991), who uses David Bohm's idea (1980) of the holographic universe:[12]

> Memory is holographic and not located in the brain directly; we can access it somehow, the same way light can recreate a hologram. Although empirically hard to prove it, memory could also include non-human or pre-human memories. The good old Freudian unconscious is a great example of a nonlocal being too. It records everything and cannot negate it, becoming more substantial than the local manifestations it produces. Freud's essay "A Note upon the Mystic Writing Pad," written in 1925, a metaphor for the human mind, would make an excellent link between geology and memory (Morton 2017).

Questioning if geological strata can be compared to the formation of memory structures and if these layers entwine, we inquired about the permeability of time boundaries in our perception: to what extent can we accurately perceive and distinguish between different periods of time?

Our perception of time is largely influenced by external factors such as clocks and calendars. Over time, ancient civilizations relied on the observation of celestial bodies to organize their lives, adopting different forms of calendar. But our perception of time is also shaped by internal factors such as memory, attention, and emotion (James 2007). Each human being may experience time differently because of their particular perceptual capacities (Mach 1914). In experiments where cavers are left without clocks in the darkness and told to emerge after a pre-agreed amount of time, they can never emerge on the right day, or at the right hour because their clocks-internal drift from the external clocks.

Indeed, the boundaries between different periods of time can be porous, particularly when we experience strong emotions or engage in certain activities that require us to focus intensely, like performing in challenging, wet environments at cold temperatures. Depending on our psychophysical condition, enthusiasm, concentration, and stamina, by acting in extreme conditions, we may lose track of how much time has passed because we are fully immersed in the present moment. Conversely, we may become hyper-aware of every passing minute by performing durational static actions.

Suppose our memories can also influence our perception of time. In that case, we may be more likely to remember events that were particularly salient or emotionally significant but also blur essential details and transform the memory of a happening, placing it differently over time from how we used to remember it years ago.[13]

Edmund Husserl (2019) defines our experience of time not as a mere flow of moments but as structured by our intentional acts of consciousness. Much like space, time is a fundamental aspect of the fabric of reality that shapes and structures our experience. However, unlike space, which we can experience directly through our senses, time is a more abstract concept that we perceive

through the passage of events and changes in the world around us. According to Morton, time shares many of the characteristics that define hyperobjects, including their complexity, pervasiveness, and difficulty in comprehending fully as equally long-term memory.[14]

A key to our site-specific and site-responsive performative practice is to enter into deep ties with the places where we perform. It is a process that can take a long time, depending on the specificities and challenges that each site presents, both in terms of physical conformation (if in nature or abandoned architectural sites) and socio-political features and dynamics (if in urban environments). We learn the place where we are to perform. We spend time listening to it. In our "Poetics of Relations," it is the place that owns us, not vice versa. Therefore, before performing in a specific location, we must get to know it and understand our limits in relation to the difficulties it presents. In extreme environments, adequate safety measures and collaboration are necessary to perform at our best. Although site-specific performances can be criticized as invasive, we attempt to connect to a place and become one with it while reducing our impact to a minimum. Do we succeed in that? With our art, we can only try. Does a place welcome and host us? And yet, do we know a place? And if we do, how and when do we know it?

Before producing the film in the spring and summer of 2021, Verena Stenke and I had visited the caves of the Swabian Jura several times since 2016. In a psychogeographic process, we discreetly spent many hours inside each of them to get to know them and understand where to perform and film. We did so to get a "permanent memory-trace" (Freud 1961, 227) of them—their particular geological characteristics, conformation and subterranean conduits etched in our memory to recognize them as familiar once shooting the film. The process and inspiration were informed as much by geopositioning as geomancy and the liminal spaces and time in between.

Memory aids and devices, even a simple image, an object, a word, a smell, or a sound, help us to remember something—not just on a rational level but on a sensory one. Mnemonic processes and techniques can be highly performative: visualization, association, location, imagination, and repetition (all principles of memory) can help us remember and retrieve information more effectively. For example, the ancient mnemonic technique of the method of loci (also known as the "memory palace" or "mental walk" technique) was used by the Greeks and the Romans. It involves visualizing a familiar place and associating pieces of information with specific locations within that place, mentally travelling back through its environment to recall the information (Yates 1984).

We exercised the method of loci to recall and assemble fragments of memory we had of the caves and caverns we repeatedly visited. In doing so, we recomposed them in our minds so that they inspired us and stimulated our imagination to glimpse the performative images that, once we went back to filming in the cave, we could create. In addition, we often practised dynamic breathing techniques, which were helpful in reawakening sensations, sense memory, and vision in helping us locate ourselves.

Dealing with our memory archive in this way helped to bring forth durational aesthetics and the unfolding of actions over time, which give access to other temporalities. We consider performance and filmmaking as cognitive tools to recall places and situations from whence to create new ones—for instance, through visual metaphors or associated sounds.

While undertaking this complex thought process, we still needed help understanding how to translate deep time performatively. If everything in the universe is interconnected, is it possible to think that deep time is somehow connected to our genetic memory? Are pieces of it inscribed in it? If so, what do we remember about it?

Fascinating as it may be, the idea that deep time is connected to our genetic memory presents no empirical evidence. Going back billions of years to the origins of the universe, deep time precedes human existence. We can conceptualize and intellectualize it philosophically, but our understanding is based mainly on a range of scientific evidence, geological data, astronomical observations, and biological research. For instance, the *STRATA* approach to time is a way of conceptualizing time in geology, dividing it into discrete intervals or strata based on the layers of sedimentary rock that accumulate over time. It is an essential tool for studying life and Earth's evolution and an organizational conceit for the work at hand.

Even though we were going to perform in particular environments where time is not the metronomic tick of the clock, how could we perform temporary associations and dissociations without hierarchy, to bring Earth time and body time closer in synchrony? How could we engage our bodies to find poetic connections and corporeal affiliations between the temporalities of the geologic, human labour and life spans? "The more we analyse, the more ambiguous things become" (Morton 2010, 40).

During our collaborative performances and filming of *STRATA*, one of the artists Stenke and I invited to participate in the film, Nicola Fornoni, a young Italian performer with severe scleroderma, compared his body to the geologic: "So many layers, eroded, corroded by water and the natural transformations through the years and the eras that pass. My body has changed over the years—years that scratch harder or less harshly. I can imagine a connection between these rocks and my body, which is rigid and thin as their stratification, sharing some minerals with them, such as calcium and phosphorus."[15]

In order to embark on a performance-based film about an imaginary journey that questions the structure of time and the essence of the human being interconnected to the realm of hyperobjects, *prima materia*, and the geological, we considered the importance of a transcendental time perspective. Many scholars have used this notion to describe different aspects of Husserl's phenomenological philosophy and the concept of transcendental imagination, already present in different ways in Kant and subsequently in the work of Heidegger and Merleau-Ponty.

The transcendental time perspective refers to the individual capacity to cross the limits of the earthly life, from mental travelling to eternity—thus, an idea of time implying the spiritual dimension. Paul Ricoeur discusses transcendental imagination to describe ways in which the creative and interpretive faculties of the mind shape our experiences of time and narrative. In his essay, "Imagination in Discourse and Action," he writes, "By mapping out actions in this way, the storyteller produces the same reference as the poet who, in Aristotle's terms, imitates reality in his mythical reinvention. The story is a heuristic process of redescription in which the heuristic function stems from the narrative structure and redescription has the action itself for referent" (1994, 125).

Precisely those words gave us the decisive impulse on how to tackle time's complexity in the film. We did not choose the linear approach of the Judeo-Christian eschatological tradition, nor the circularity present in ancient cultures, where time cyclically devours everything. Rather, we sought an alternative to the philosophical concepts of Newton and Einstein, which contextualize the being in an absolute or relative dimension of time contained in a multidimensional space, and of Heidegger, who imagined that the being exists and moves in space contained in a multi-temporal dimension. Even the idea of the infinite present could not correspond to the experience of entry, transit, and exit that occurs when continually entering a cave, performing in it, and then coming back out, constantly shifting from the outside to the inside.

During the film production, we soon realized that our performative actions were somehow wedging into one another, clustering on top of each other but opening in opposite yet connected trajectories and directions, forming a spiral-like pattern. They were like growing strata of space-time and movement, captured by the video camera, and that could still be layered and edited in different orders depending on our artistic choice.

The concept of spiral time implies that the action patterns tend to repeat themselves, but not precisely in the same way as the cycles of life, death, and rebirth in some spiritual and mystical traditions. Action patterns evolve and change as they repeat, creating a spiral or a process of growth and transformation, moving outward and upward, expanding and evolving, like Bohm's idea of a dynamic interplay of order and chaos to which Timothy Morton also refers concerning larger societal and cultural patterns, nature and time.

Discussing the notion of the spiral, philosopher and psychologist Jean Gebser sees the poet "participating in the timeless memory of the world" (1985, 327). Morton assumes a new level of human awareness transcending the limitations of the modern, rational mind for a more intuitive understanding of consciousness, time, and space.

Enok Ripley. *Ammonite's Time*. Spiral branding. Film still, 2021.

From our artistic perspective, the caves that sheltered our ancestors are not simulacra of origin. We see them as places of sharing, shells of the inner world, metaphors for our insides, spaces where a transcendent reality exists, and thoughts enter a process of becoming form. We ventured inside them audaciously but respectfully, always in silence. We tried to understand the geological by artistic generative encounters. Do we have the right to go inside them so far and perform? Have we learned to embody time cadence and rhythm?

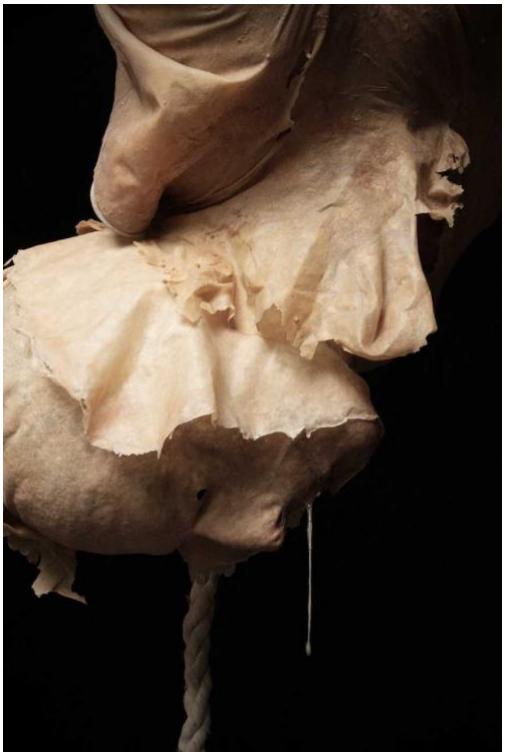
In *The Order of Time*, Carlo Rovelli weaves together quantum physics with poetry. The Big Bang happens. Hydrogen becomes helium. The stars fall in an infinite play of combinations, drawing the direction of time. We are exploded particles of space-time, "we are all burnt by ultraviolet rays. We all contain water in about the same ratio as Earth does, and salt water in the same ratio as oceans do. We are poems about the hyperobject Earth" (Morton 2013a, 51).

We are the effect of the boiling of a sun—its wind creating strange structures that are us, allowing our existence. We are memory and nostalgia, and we are time, and "the emotion of time is precisely what time is for us" (Rovelli 2018).

Inside the conduits of the Falkensteiner Cave, looking for the best places to perform, I observe drops of water falling from the cave walls onto a flowstone.[16] They splash on my face intermittently as thought flashes and lap; my face wrinkles as with rock cracks and caesuras. Faced with the experience of opening to the nonhuman to tune into deep time and weave semantic relationships within it, we thought we should try to become allies, perhaps finding inspiration from characters who have already dealt with time in some way, like Walter Benjamin's "angel of history" (1999, 249). Besides the therianthropes, Stenke and I embodied imaginary creatures trapped since birth inside the geological formations of caves and blind like olms.[17]

In the film, these anthropomorphic salamanders move blindly among the caves' structures as if to find some peace, their every thought and gesture captured in dark chambers and wet ochre corridors impossible to avoid, just as impossible as it is to hide in memory.

One/Many (Blind Latex Creature). Performance by Verena Stenke (VestAndPage). Location: Schiller Cave. Photo: Fenia Kotsopoulou, 2021.



Birth (Blind Latex Creature). Performance by Andrea Pagnes (VestAndPage). Location: Sirgenstein Cave. Photo: Marcel Sparmann, 2021.

They are imaginary creatures that appear and disappear, recasting their memory hanging upside down from the cave ceilings like bats. They pass through places during, before, or after other scenes have happened. They move backward in time—time themselves—where an opera duo play a Bach sonata and four Schubert Lieder in the Hohle Fels, a breathless limestone cathedral shaped by nature over millions of years. In the Sirgenstein Cave, they rest invisibly behind the three Fates, nearby the shadow of a bow musician, or at the side of a man repeatedly yelling the words of the Lord: "Where were you when I laid the earth's foundation? Tell me, if you understand" (Bibles 2011, Job 38:4). They follow Roy Hart vocal performers lending their voices to time in the darkness. They meet inside the rock eye of the Kleine Grotte (Small Cavern) for a moment of love to die and be reborn in their grace. Then, the Woman Waterbird recovers gently their old skin resurfacing from the Blautopf (Blue Pot), the spring that forms the drain for the Blau cave system extending for tens of kilometres underneath.

Schubert's Wanderer. Music performance by Stephan Knies (violin and viola) and Andreas Bauer Kanabas (basso profondo). Location: Hohle Fels (Hollow Rock Cave). Photo: Marcel Sparmann, 2021.

Solo for Shadow. Music performance by Aldo Aliprandi (handmade string bow). Location: Sirgenstein Cave. Film still, 2021.

Pietas. Performance by Verena Stenke and Andrea Pagnes (VestAndPage). Location: the eye of the Kleine Grotte (Small Grotto). Film still, 2021.

Transit/The Woman Waterbird (Black). Performance by Marianna Andrigo. Location: Blautopf spring. Photo: Marcel Sparmann, 2021.

In the more difficult caves to access, and due to the low temperatures of the water and the mud, we were able to complete only a small number of performances, often performing only one at a time. After two hours inside the cave, the body begins to show clear signs of fatigue and possible hypothermia, especially when performing half-naked. That was how it was in Schiller Cave when I performed the *Angel of History* in its mud funnel, and I immersed myself in the icy waters of the Wimsener Cave; and when I tested my physical limits of resistance to the cold going upriver through the Falkensteiner Cave subterranean creek to perform half-naked the wanderer angel.

Anticlockwise/Angel of History/Wanderer Angel. Performance by Andrea Pagnes (VestAndPage). Location: Schiller Cave. Photo: Fenia Kotsopoulou, 2021.

Caves that are dominated by water are mutable, unstable places: coursing water prevents the rocks from forming closures, causing voids and sudden dislocations. The day I performed the wanderer angel inside the Falkensteiner Cave, I decided not to wear my neoprene suit to move more quickly. The entrance to the Falkensteiner Cave is a sizeable funnel-shaped corridor studded with rocks and stones. From below its huge arched portal, a creek flows out, extending for all 4,259 metres of the cave's floors, carving its depths. In 1776, a miner killed himself inside this cave. He was searching for gold, and there was none to be found. He was buried right *in situ*.

Before entering to perform the wanderer angel, I pause and concentrate for a few minutes, staring at a sizeable, cubical rock ahead. Then, I slip through the initial compressed vault of rocks and water of the Demutschluf (Humility Water Passage), as this is the obligatory passage and threshold from which to proceed. The rocky roof of the Demutschluf is massive, smoothed, long, and very low. I pass through it, walk further, and kneel in a small cove. I wait for Douglas to position the mics, daz to turn on the lights, and Verena to start filming.

The damp walls of the cave cling to my skin. Cold water drips from my limbs. I try to think of nothing but faith to embrace, but I begin to feel my body becoming numb. I am dressed only in a pair of large wings that prevent me from moving nimbly and a mask made of gauze and bells that blind my gaze. I stretch my body, I feel the limits; I have to become cold like this water to make this performance make sense, but I cannot play with my bodily limits. When I finally enter the freezing water again to perform, the heat loss from my body begins to create a cloud of steam around me. I feel the adrenaline rising. My stomach tightens.

daz gives me more lights. I catch a glimpse of the flashes and follow them. It is as if I were inside a surreal, timeless spectacle. The glaring lights form bars that come together and fray like stars, but here we are underground. Under my mask, I glimpse the silhouettes of stalactites and stalagmites that lash the space, spears on display in the armoury of nature, letters from lost alphabets that seal the rocks on which they stand or hang from, as if composing the tale of deep time, split from the idea of the human-divine. I feel like I am lucid dreaming or experiencing some sort of hallucination. It is probably just my defence mechanism to imagine I am in an

altered state of consciousness, certainly to forget about the cold. Actually, I am perfectly aware the slightest mistake would compromise everything. It is the last day we have to film inside the Falkensteiner Cave. After working hard for two weeks nonstop, we are all tired and yesterday my scenes did not turn out particularly well. I must use up all my remaining energies. Trapped here, the wanderer angel can only be among their memories—the memories of their torn wings. What does it mean to say that time passes? Moving backward is like performing the expiration of time or performing while time expires. If I stop and do nothing, nothing happens. If I stay longer than necessary, I risk hypothermia. Therefore, the chances of performing or repeating the same action more than once are very remote. The pressure builds; I cannot take it anymore. I must get out of this cave's time. It's only hers. I must go back while looking forward, for the wanderer angel is the opposite of Benjamin's Angel of History: mortal and nothing else. I am almost at the exit. One last effort. One final thought: if I could go liquid, I could slip into the cave crevices and synchronize with its time. But I am a fragile solid, and I can only immerse myself in my finite time, cherishing every fleeting moment of my brief existence.

Castaway through Time/Wanderer Angel (1). Performance by Andrea Pagnes (VestAndPage) Location: Humility Passage (Falkensteiner Cave). Photo: daz disley, 2021.

Castaway through Time/Wanderer Angel (2). Performance by Andrea Pagnes (VestAndPage) Location: Humility Passage (Falkensteiner Cave). Photo: daz disley, 2021.

5. The Performance-Based Filmmaking Approach

By Verena Stenke (VestAndPage)

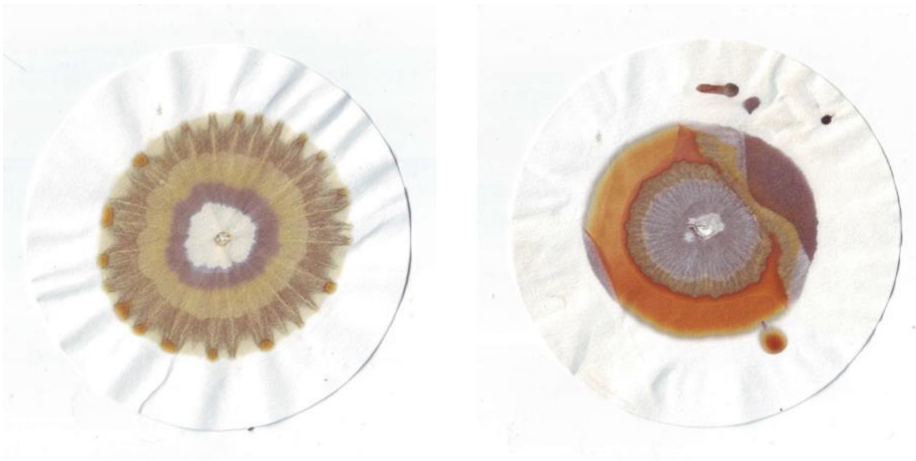
Time reversal might be unlikely to occur in nature, but reverse motion in filmmaking is possible. Although illusory, it can give the sensation of a character going backward through time. In that, a film can function as a kind of wormhole where space-time is illusory, revealing the connections between apparently disconnected things and situations, thus offering a key to search for meaning and purpose.

In exploring philosophical themes through performance-based filmmaking practice, the formal aspects of filmmaking are reduced to a minimum. We often use long takes, a static or handheld camera, and a minimalist approach to performing—approaching a *tableau vivant*. For us, "film as a medium is a mnemonic of the potential, a catalyst of the manifest, and a shrine to the residual. Performance art can challenge it by not adhering to pre-ordered linearity. Each performance and each film are an answer to the question: How do we read reality?" (Stenke and Pagnes 2020, 5). Through performance-based filmmaking, we examine how the original documentation of performative acts develops into complex, nonlinear narratives. Our films are the outcomes of creative experiences and research processes.

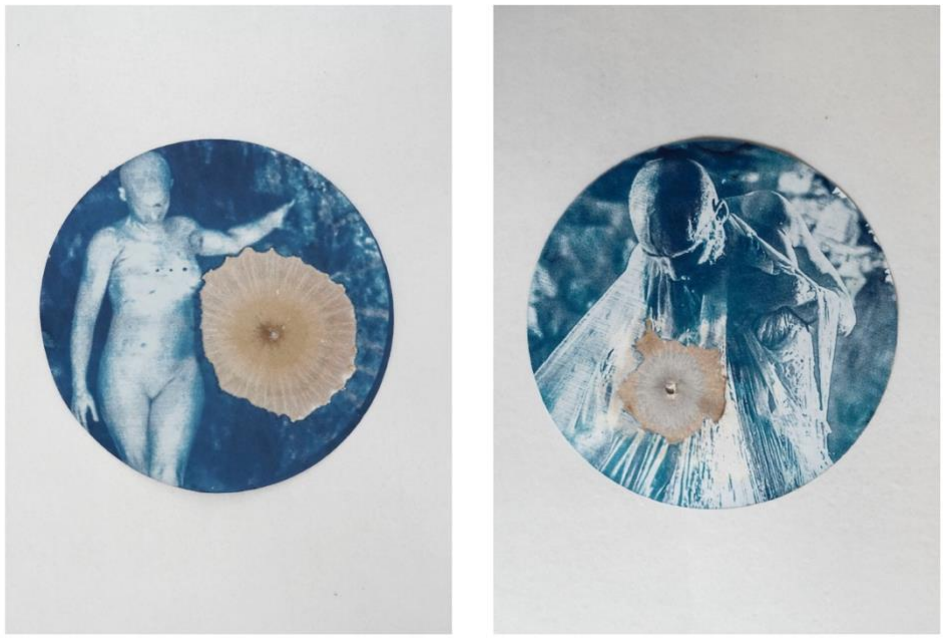
We look to the reflexive mode in our approach to documentaries. As such, they are not "a transparent window on the world; instead they draw attention to their own constructedness, and the fact that they are representations" (Burton 2007). We do not travel to a place to tell a story—we journey to a place to find its story, seeking new images that depict inner landscapes. We create subject matter by responding to a chosen site with its given setting and circumstance and by performing the actions it evokes in us.

The film is not side-tracked by adhering to a script or a storyboard. It remains open, entrusted to the thoughtfulness of the performers and the camera operators. Everything is subject to change until the end of the editing process. The story builds through performance: action by action, overlapping, and stratifying over one another. Only later, the recorded material reveals the film's inherent dramaturgical structure.

The video camera serves as a sketchbook: it captures happenings and sketches the film as it unfolds. Instead of pre-drafting scenes and planning the production according to them, we follow our intuition—the camera documents the performances and turns their ephemerality into an archived, digitized memory for a story yet-to-be-born. In reviewing the raw footage of the scenes, the video camera functions as a geophysical, psychogeographic magnifying glass to glimpse specks of stunning subterranean natural locations. Many of these sites could one day vanish as a result of human activity.



Fenia Kotsopoulou. Cave soil and *STRATA* performers' hair chromatographies. Images courtesy of the artist, 2021.



Fenia Kotsopoulou. Cave soil and *STRATA* performers' hair chromatographies on film still cyanotypes. Images courtesy of the artist, 2021.

In our past films, just the two of us (Andrea and Verena) worked on all aspects of creation and post-production. Because of *STRATA*'s artistic and logistic complexity, we invited a selected team of long-term collaborators familiar with our poetics and methodology. Reciprocal trust and collaborative qualities are essential, as the dark, deep cave systems are critical environments: misunderstandings and lack of attention can have severe consequences for everyone.

We use non-invasive equipment, as agility, readiness and efficiency are vital for performing and filming in extreme environments. There is little time to set up lights and cameras. Inside the caves of the Swabian Jura, temperatures range from seven to nine degrees Celsius at 80 percent humidity, and the water is cold, between four and six degrees Celsius. Performers' stamina is drained standing or waiting in a cave: only maximum efficiency can guarantee their best performance. Likewise, strike-downs and exits must be structured and executed quickly so everyone can return safely. Managing and maintaining one's energy levels both outside and inside the cave is of prime importance in a production that sees us working in such harsh conditions every day for months at a time.

Before entering a cave to shoot a scene, we draft a plan of action based on the particulars of each site: some caves are tortuous mazes of narrow passages, barely half a metre in height or width, while others are filled with pools of water and strong currents with only a few centimetres between surface and ceiling. Careful attention is paid to the order of entrance of each crew member to get into the cave, the setup time for the tech system, the basic outline of the performance action, the time of strike down, and the order of exit from the cave. Within these margins, everyone knows their responsibilities and possibilities. We check in with each other many times, and by holding the space together, we ensure mutual safety for installation and performance.

Inside the caves, our crew usually consisted of two video camera operators, the sound engineer, the lighting designer, the performers, one photographer, and one assistant (often one of the two directors, operating likewise as a location supervisor and safety officer to make sure that the crew members have everything they need). At the cave entrance, two other performers wait with refreshments for the cave crew to return. They help them change clothes and recover, ensuring first aid or immediate help in emergencies. In addition to the hazards of falls, scrapes, and bruises—or worse—the main concern is hypothermia.

In our films, a topic or a concept is the frame within which our co-creative processes move. This was also the case in trying to explore the idea of deep time by producing *STRATA*. The emotional structure of the film's content is based on our memories and experiences made during production.

We perform in real time: the camera captures our actions, and in the editing, we process them into moving images. We never perform the same action twice. The spoken text is left to background voices in a poetic stream of consciousness. We seek to create a meditative atmosphere to tap into spiritual realities and convey an immersive, transcendental experience through cinematic language to allow the viewer to become absorbed in the film's images and sounds (Schrader 2018).

Our visceral way of performing in response to the environment means that we cannot foresee a performance before making it. We use the camera intuitively, and it must be an essentially practical device, like a mnemonic prosthesis, which aids memory.

I use my camcorder handheld, rarely setting it on a tripod. In this way, I can choose my positioning more flexibly according to the performer's prerogative. I do not consider gimbals helpful in constricted environments, as I use my camera as if it were a direct artificial limb. A performance in progress cannot simply be interrupted by technical concerns, so I need to be well-equipped to film it, being as adaptable, quick, and intuitive as the performers themselves. In most of the womb-like caves, I filmed with my medium-sized handheld Sony camcorder. We used a more compact Canon digital single-lens reflex cameras or small, versatile action cameras in tight caverns.

I prefer camcorders for their resilience in extreme environments and excellent automatic zoom capacity. I have filmed with my camcorders in locations where our colleagues with DSLRs panicked because their equipment failed, broke apart, or a piece rolled down a crevasse and was lost forever. Luckily, our self-contained compact camcorders—drenched in mud, humidity, heat, cold or dirt and dropped on the ground multiple times—have never shown any shortcomings, whether shooting in glacial Antarctica, in the dusty Negev desert or moist underground cave systems.

Another factor in my camera choice is the fully automatic function. The camera should do almost everything, as what cannot be done automatically needs to be sorted out in post-production with radical cuts and thorough colour grading. A powerful integrated zoom lens allows rapid close-ups without laborious, unfeasible lens changing.

Filming *STRATA*. Sara Simeoni and daz disley. Location: Falkensteiner Cave. Photo: Marcel Sparmann, 2021.

Filming *STRATA*. Verena Stenke (VestAndPage). Location: Falkensteiner Cave. Photo: Marcel Sparmann, 2021.

Filming *STRATA*. Verena Stenke (VestAndPage) and daz disley location scouting. Falkensteiner Cave. Photo: Fenia Kotsopoulou, 2021.

While filming inside the caves, I avoided moving around so as not to cause noise, stir up mud, or risk slipping with the camera in my hand. Canyoning shoes were helpful for protection and stability. Under dripping water with cold, sticky hands, in the dark and with a performance artist ready to act, it is impractical to lose time fumbling around with lenses or meticulously setting white balance, ISO, aperture, shutter speed, and focus by turning tiny wheels, pushing hidden buttons, or trying to read any setting details from a microscale, foggy monitor. The main factor involved is standing firmly without slipping and holding the camera firmly in my hands, not making a sound, and pressing the record button. We camera operators always wore children's bibs around our necks to clean our fingers of mud before touching the devices. This was because all our clothes would inevitably be muddy once we reached the chosen spot to perform and film. Caves are always technically challenging for filming. They are humid environments, cold and damp places with water seeping through the rocks, dripping from the ceiling, running along the walls, and collecting in pools as soon as it rains outside.

For example, the active water Falkensteiner Cave has passages filled neck-deep with chilly stream water. Its walls are rough and uneven, with jagged rock formations, and the riverbed is covered in large stones and loose gravel—often with smooth polished limestone, which made for treacherous footing. Crawling and crouching are necessary. The Gustav-Jakob Cave is a passage cave. Although awe-inspiring, with its unique combination of natural beauty and potential hazards, it can create a feeling of confinement or claustrophobia. It is extremely tight, with little room to manoeuvre, so that only one person at a time can proceed, mainly by sliding on the belly to squeeze through corridors barely wide enough to accommodate an adult body. Dragging or pulling backpacks containing large, sensitive technical equipment is impossible, and there is no room to rearrange once inside. Everything has to be small and handheld. In these challenging environmental conditions, the video operator can only capture what is possible in the immediacy and site-responsiveness of the performers making their actions. With limited time, in constrictive spaces characterized by low light levels, cool temperatures, and limited ventilation, every move must be focused and mindful.

Inside and forth. Performance by Sara Simeoni. Location: Gustav-Jakob Cave. Photo: daz disley, 2021.

We have shot about thirty hours of non-staged performance actions inside caves and caverns, along with recording poetic texts, sounds, and musical soundscapes. From this material, we have extracted up to two hours to realize *STRATA* as a feature film. For me, editing is composing, subjectively recollecting, and selecting fragments, scattered shards of an experience, to reassemble, replace, and reconfigure them organically into one whole. As part of our editing process, we subtract the unnecessary to reveal the intimate connections, possible links, and relationships between the chosen fragments. Digital treatments such as glitch, dissolve, reverse, or layering unveil perceptions of realities not visible but manifest in real life. I consider them elemental to the unfolding of a nonlinear narrative that can come into being through the editing process—one of the many possible configurations of the shattered shards. If a story arises, it will tell itself.

Our film editing process is not determined by a pre-established sequence of performances but by our "creative desire to associate images over time" (Schrader 2018, 3). We do so to blur the boundaries between reality and imagination and deliver poetic opacities and abstractions shaped by performing—the resulting moving images piercing through the curtain of the conventional. The film can be read by every viewer in a personal way. André Bazin scholars describe this as "the democracy of the eye—given the opportunity, the eye will explore" (Schrader 2018, 19). The viewer is free to create their narrative, being "the one who looks at within the womb-like, Platonic cave of cinema" (Vudka, forthcoming).

Filming *STRATA*. Verena Stenke (VestAndPage) and Douglas Quin sound recording. Location: Bärenhöhle (The Bears Cave). Photo: Marcel Sparmann, 2021.

Filming *STRATA*. Verena Stenke (VestAndPage). Location: Schiller Cave. Photo: Fenia Kotsopoulou, 2021.

STRATA Film excerpt: https://vimeo.com/763053904/f69ab8715c.

6. The Sound of *STRATA*

By Douglas Quin

Mist and cigarette smoke curled around the table outside a café in Venice. It was early December and the waning din of revellers and conversations ebbed into the night. The 2016 Venice International Performance Art Week was in full swing and VestAndPage were already mulling over their next project. "We want to do something involving caves and deep time." While still very much a nascent idea, they were keen from the outset to have sound as an integral aspect of performances, the resulting film, and whatever other iterations might emerge. If sound was to be included, they stressed, it had to be born of place and an expression of our fleeting encounters, rather than underscore as exogenous accompaniment.

So, where to begin? We are only beginning to wrap our minds around the fact that the aftershock of the Big Bang still travels through the known universe. What came before? Like the rest of our team, I was reminded of James Hutton contemplating the abyss of time as he tried to make sense of the craggy unconformity of rock outcrops on the windswept coastline of Scotland.

As a sound designer and composer, I tend to think of sounds—at least at the tactical, granular level—as having a life span: attack, initial decay, sustain, and release. What about deep time? I was intrigued and had more questions than answers. What role can sound play in the project? What complementary truths or perspectives can sound reveal about the performances, places, spaces, and what can it bring to the film?

I had had some prior experience recording in caves: melting ice caves in Antarctica; the exodus of bats in the Guardirikiri caves in Aruba; and playing with the reflections of my voice in the sheltered parabola of Arkaroo Rock in South Australia. In each case, I was struck by those qualities of sound that are specific to each location. Reverberation times, diffusion and echoes are unique to a given space. So are resonant frequencies, where the shape and size of a cave or chamber seem to amplify or colour certain sounds or discrete parts of the audio spectrum. I found it interesting that researchers were exploring the possible connection between sound and where art in caves are found. In many cases there is a distinct acoustic signature associated with

the location of a work of art—usually in the form of an echo or pronounced reverberation (Fessenden 2018).

Douglas Quin. Sound artist/cave dweller. Location: Falkensteiner Cave. Photo: Fenia Kotsopoulou, 2021.

The echo is, to some extent, an original sound, and therein is the magic and charm of it. It is not merely a repetition of what was worth repeating . . . but partly the voice of the wood.
—Henry David Thoreau (2004, 95)

Over the course of the next few years of pre-production planning and site visits, Verena and Andrea assembled a widening circle of artists, scientists, and collaborators. We were invited to respond *in situ* to any one or series of nearly a dozen caves across the Swabian Jura. Each participant was given broad latitude with respect to the "what, how and why" of their respective contributions. What story could you find, or want to tell? How can your performance, actions, or research animate and connect present and past and body to space?

Matters of form and structure with *STRATA* are the subject of ongoing conversation as performances, video footage, and audio recordings have revealed and suggested different possibilities. Much of the production is complete as we begin post-production. The cave is the mise-en-scène, or *mise-en-abyme*, as Verena described it; that is, a "Chinese Box" or story within a story, a spiralling fractal. The caves are physical and liminal spaces with traces of human presence reaching back more than forty thousand years; propositions; vectors; questions to be explored; and a multivalent metaphor.

SPACE is just the question to ask if we think about TIME.
—Verena Stenke

Given the importance of sound, I have done a lot of listening to people and ideas as I work with Andrea, Verena, and daz toward an organizational strategy for sound design and music. We immediately gravitated to what the caves themselves might reveal by way of their acoustic properties. Early discussions included exploring resonant frequencies in individual caves and spaces and using impulse responses to measure reverberation and echo. I asked some of the artists to make recordings of their voices so I could start generating voice prints, looking at the particulars of formants and harmonic structure: first steps to connect body and voice with place once we were in the field. We also talked about how we might use data gathered from the stratigraphy and mineral composition of the various caves as a basis for developing a score based on sonification or a generative algorithmic approach. All very quantitative approaches in the beginning—a way of taking measure of the physical and knowable.

What seemed to be coalescing after many discussions and conversations was more of a heuristic journey, or poetic stratigraphy in a sense, and that sound and music would very much reflect the dynamic and nuanced layers of experience and idiosyncrasies of both individual and collective endeavour. This became more apparent and richer as we moved from planning into production and the negotiated realities of physical engagement with flesh, the senses, and the *prima materia*—the enigma of the caves.

For Susanne Weins and Ralf Peters, sound, particularly vocalization, was their primary avenue of expression—the *logos* of their performance and connection to place. Anguezomo Mba Bikoro's wailing cries were powerful affective responses to myth, memory, and (dis)place.[14] Boris Nieslony's emotionally charged "*Wo Was Du?*" and readings from the Book of Job seemed an existential entreaty at the entrance of the Bockstein Cave, the Sirgenstein Cave, and the Eyeglass Cave. Aldo Aliprandi performed on electroacoustic instruments he built. Andreas Bauer Kanabas (bass vocalist) and Stephan Knies (violin) performed arrangements of Bach and Schubert lieders. Others were primarily concerned with visual and kinesthetic expression, and there was little or no sound to record on location, but perhaps an opportunity for layering or added audio in post. Likewise, archaeologists, speleologists, tour operators, and conservationists brought their own reckonings and perspectives to the project.

Voice/Rock/Body/Time. Voice performance by Susanne Weins. Location: Gustav-Jakob Cave. Photo: Fenia Kotsopoulou, 2021.

From Sunset to Dawn. Long durational voice performance by Ralf Peters. Location: Sirgenstein Cave. Photo: Marcel Sparmann, 2021.

Boris Nieslony. *On Access and Permission: A Conversation.* Location: Brillenhöhle (The Eyeglass Cave). The *STRATA* Knowledge Archive. Interview still. © VestAndPage, 2021.

However formative and expansive, I had to start somewhere and plan accordingly: from conceptual framing to the logistics of working in often demanding and unknown conditions. Like daz, I had to figure out how to accommodate an emergent aesthetic with practical and often very specific solutions on a budget. Having the "right tool for the job" for any eventuality meant making sure we had everything at hand on any given day: the right recorders and microphones to capture both performances and spaces. If the location audio was well-recorded, the post-production process would be creative and exciting rather than being mired in a nightmare of salvage, cleaning, and restoration. I have always bristled at the notion of "we'll fix it in post" when it comes to production audio. Simply put, from my point of view: garbage in = garbage out. Besides, much like cinematography, the practice of recording—whether in a studio or in the field—is itself an art as much as it is a science.

The approach to the Gustav-Jakob Cave was a circuitous track from the staging area where we parked, slipping into the forest on slick polished, well-trod limestone and mud. It had been raining, with significant flooding in the area. We stretched out our line, all carrying equipment on our backs and in our arms, sliding and grasping at roots and branches to avoid falling. The soundscape in the middle of the day had settled into a gentle thrum of insects and occasional birdsong. We reassembled at the cave entrance, on a small, inclined porch with a steep drop-off, suspended high above the valley floor. The opening yawned before us and exhaled a cool, damp breath. Some of the team had been through Gustav-Jakob from one end to the other several times. This was my second visit. It is a twisting umbilical with switchbacks that rise and fall with several passages measuring no more than about fifty centimetres in places—either vertically or

horizontally, and sometimes both. A few places opened into chambers that could accommodate several people at once.

The rock surfaces were cool, wet, and the floor muddy and slippery from the rains. The watery surfaces provided a curious form of acoustic treatment, with some sounds appearing livelier and brighter. Given the confines of our movements and cramped space, we were all immediately aware of our own sound: of breath and the pulse of effort and of our clothing rubbing and scraping against the walls. Words from those a few metres in front or behind seemed to be swallowed up. We rounded a corner that Verena and Andrea had noticed because of a slight concave depression in the wall at head height. It produced a slight whispering gallery effect, amplifying the sound of one's voice if you were positioned just right. Further on, we entered a chamber that became known as "The Chapel."

The Chapel came as a relief in that we could stand up and stretch, even though the floor was on a steep incline and quite slippery. The ceiling rose about four metres and was dripping with stalactites that hung above like tracery in a Gothic chapel. High up to one side there was an alcove that opened to another passage: a good perspective from which to record. Susanne Weins prepared to perform here: dressed in a sweep of white fabric, with snakeskin, she breathed in the cave's vapours and vocalized while a bright green shaft of laser light illuminated her mouth and throat. The scene was short and shot from several different angles. For sound, I wanted to be able to capture both the intimacy of her performance using a lavalier microphone along with a directional shotgun microphone using a boom from further away. Finally, I used an ambisonic microphone placed on the ledge to capture the overall sound of the space, including dripping from numerous sources.

Briefly, ambisonic recording uses four microphones grouped tightly together, pointed in different directions. The utility of this is that a recording using this technique can be easily manipulated in post-production to render anything from a monaural, one-channel perspective to a sixteen-channel, fully spatialized rendering. It is very useful in film for surround sound where much of the spatial and acoustic qualities of the original location can be preserved.

Given the challenges of organizing lights and cameras in The Chapel, we decided that Susanne and I would take another pass at recording her voice after everyone else had moved on. "Quiet on the set" is often impossible.

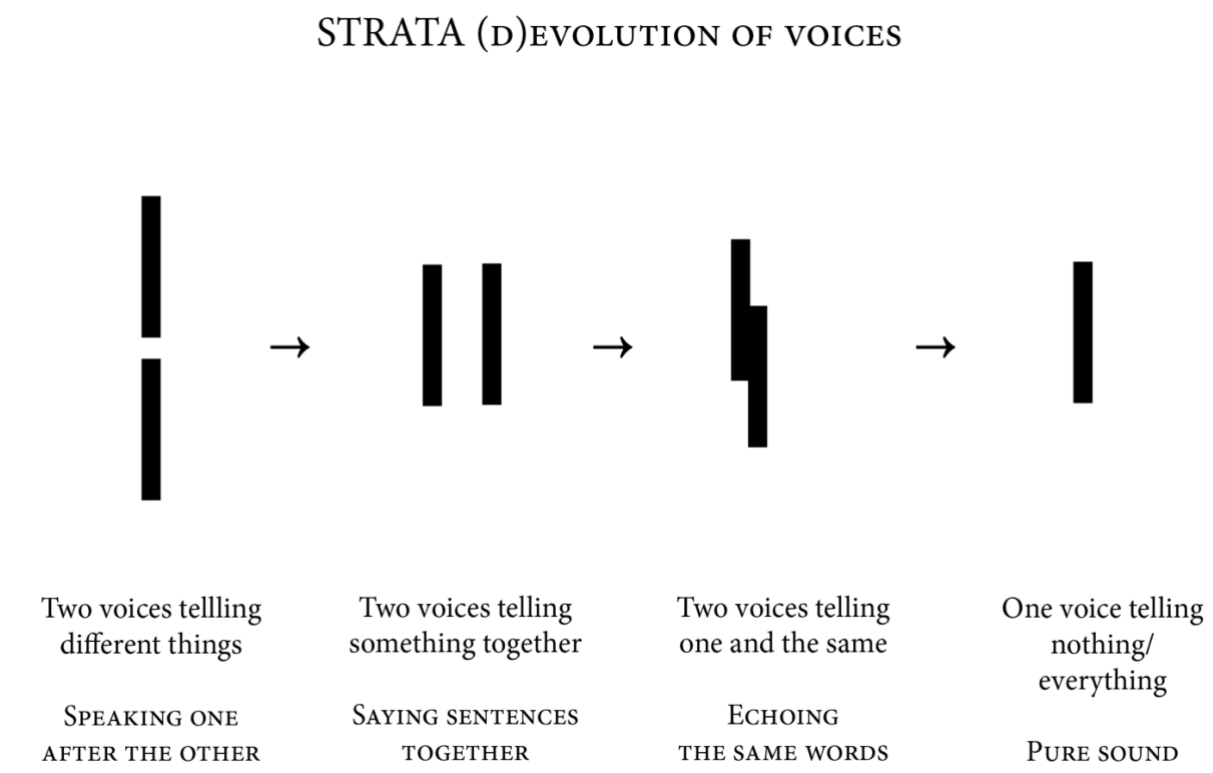
Auditory space is very different from visual space. We are always at the edge of visual space, looking in with the eye. But we are always at the centre of auditory space, listening out with the ear.

—R. Murray Schafer (2009, 33)

Susanne and I sat, still in the total darkness of The Chapel—the complete deprivation of the visual animated all our other senses. We could hear the rest of the group making their way deeper into the labyrinth. Their voices quickly became unintelligible with all the higher frequencies and sibilance dissipating. Soon all that was heard were occasional round low, hollow sounds, like irregular beats. Then silence. We stilled ourselves for several minutes and allowed our breathing to synchronize with the polyrhythms and percolations of dripping water. From one direction a steady stream of tiny droplets fell with the subtlest of impact on the floor. Every now and then a larger drop rolled off a rounded stalactite and fell into a small, shallow pool of water with an emphatic pitched plop. In time we could hear the extent of the space all around us and, while we had had a brief visual introduction by way of torch light, daz's theatre lighting and green laser, everything about The Chapel seemed heightened and more attenuated in the dark.

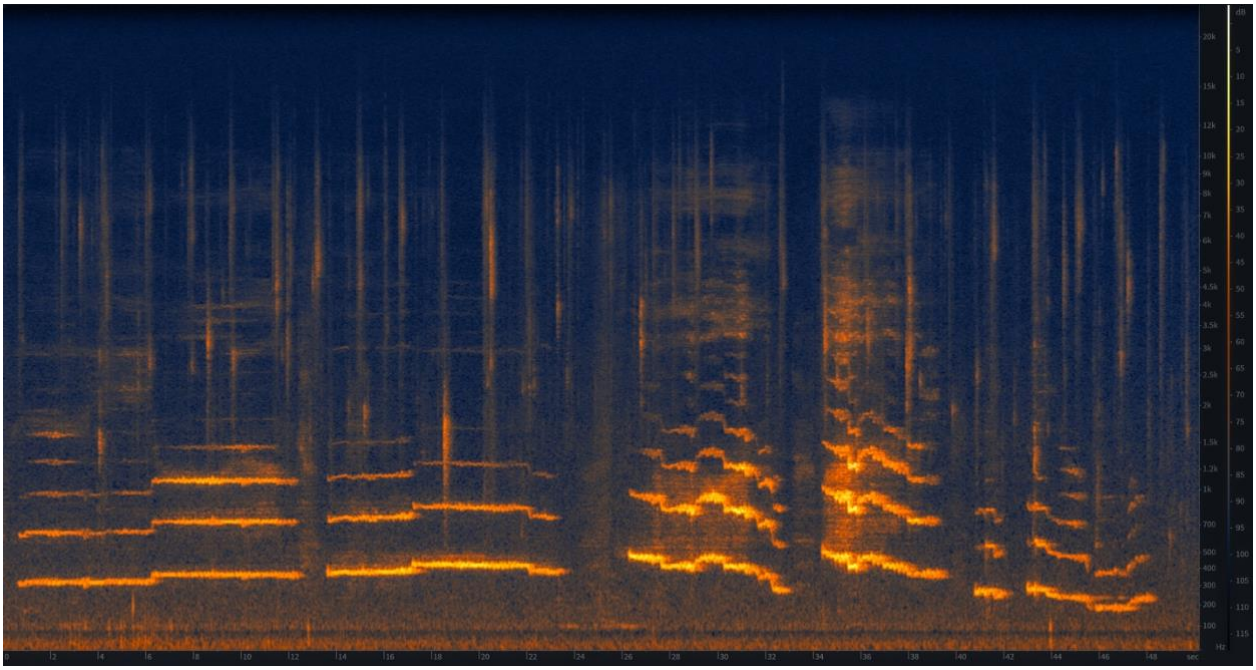
Susanne began to vocalize: from deep within her chest, stirring her vocal cords, giving life to a palette of phonemes and sounds that she modulated with her tongue and palate. She seemed to play the space as she shaped sounds, finding frequencies that amplified both within her body and with the sympathetic resonant frequencies of the chamber. Again, we sat in silence before joining the others.

In the months and years following the field work, as footage and audio were logged and reviewed, greater clarity was emerging with respect to form and structure. Key to this, in terms of audio, is the role of voice and vocal performance: from verbal and non-verbal speech, improvised vocalization, to singing. We had a lot of material to choose from both in content and form. Verena created a template for how we might approach voice within the film, *STRATA (D) Evolution of Voices*. While not a rigid directive, it provides a guide for the dynamic interplay of vocal elements that are a central feature of the film's soundtrack.



Verena Stenke's template for the (d)evolution of voices: speaking in turn; voices in unison; echo and overlapping in time; and the last, "pure sound," or vocal metamorphosis.

Back in my studio, I listened to the recordings and started analyzing Susanne's voice. I was struck by the range, power, and delicacy of her vocalizations. An audio sample excerpt of her performance is represented visually by a spectrograph of the same. As an experiment within the "pure sound" purview of the *(D)evolution of voices*, I deconstructed her voice from The Chapel, isolating specific parts of the harmonic spectrum, reorganizing and superimposing them with different phonemes and vocal fragments: first steps taken in a compositional direction. A second audio sample and the corresponding spectrograph are an example of extracting specific formants. The spectrographs of her voice reminded me of stratigraphic diagrams and our study of geomorphology—more an intuitive and associative poetic observation than a rigorous methodology.

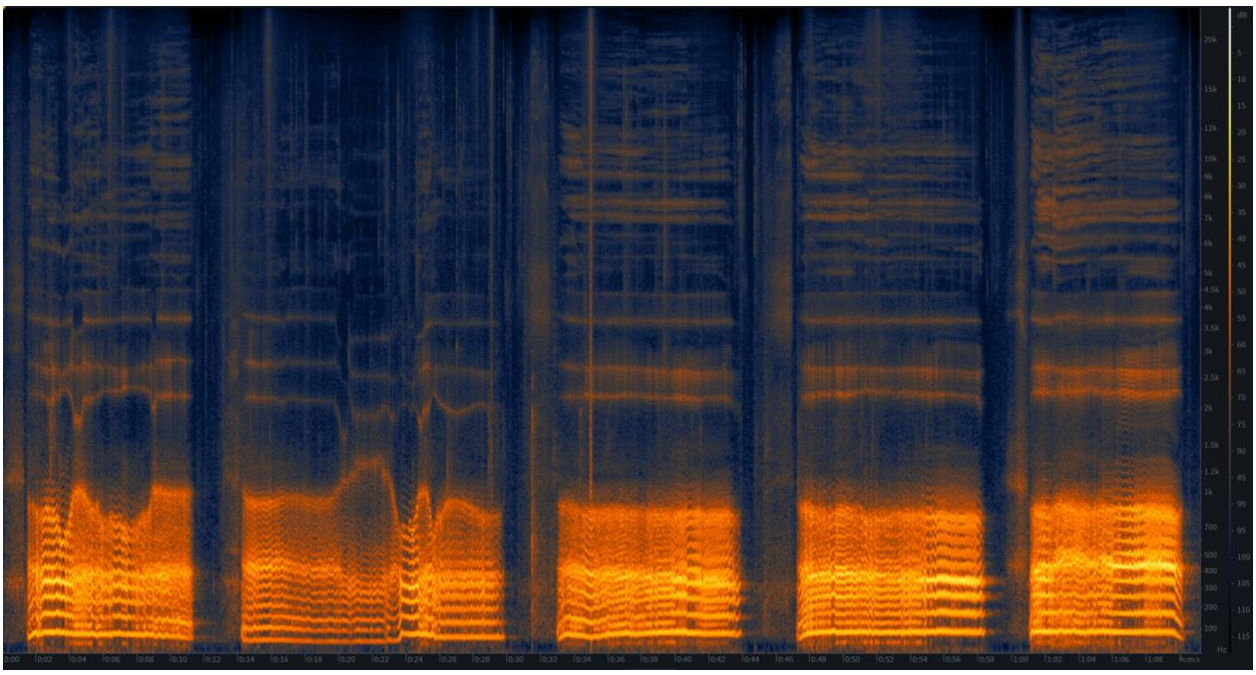


Spectrograph of an excerpt of Susanne Weins's vocal performance in The Chapel at the Gustav-Jakob Cave. Time is on the horizontal axis and frequency on the vertical axis. The bands show the harmonic overtones or formants of her voice. The brighter regions correspond to louder aspects of her voice, with the fundamental, or lowest, frequency being the loudest part. It is interesting to note that the first two harmonics of her voice to the right of the spectrograph are almost as loud as the fundamental frequency. This is a function of her vocal tract and chest resonance, the power of this particular passage, as well as the resonant frequency of The Chapel. The vertical lines are drops of water. Douglas Quin, 2023.

Spectrograph showing isolated harmonics from Susanne Weins's vocal performance in the Gustav-Jakob Cave. Douglas Quin, 2023.

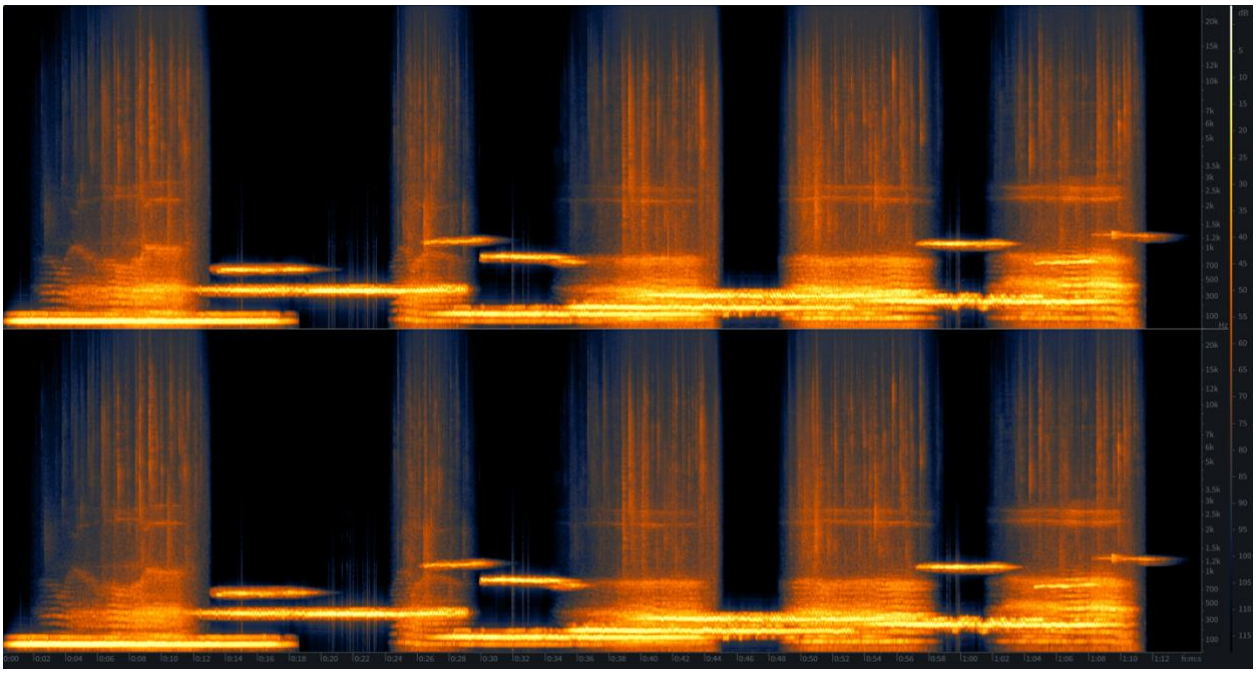
I continued to analyze the recordings of the different performers, including Ralf Peters's from the Hohle Fels Cave. I had recorded him using a lavalier microphone to capture the intimacy and details of his voice as well as with an array of other recorders and microphones placed in various locations around the cave. Each gave a different perspective and varied qualities of reverberation based on proximity and the architecture of the cave. This is similar to a cinematographer choosing camera placement and lenses. A third audio sample and the corresponding

spectrograph are an excerpt of Ralf's performance from the lavalier recording. The richness of his voice and associated spectra provided many opportunities to explore compositional possibilities—much like Susanne's voice did in the previous examples.



Spectrograph of Ralf Peters's voice from his performance in the Hohle Fels Cave. Douglas Quin, 2023.

I worked with Susanne's and Ralf's performance recordings and deconstructed artifacts of their voices to generate some musical and soundscape ideas for the film. These explore the direction of "pure sound" that Verena had shared with me. A fourth audio sample and the corresponding spectrograph is an example of these explorations. It is a metamorphic passage of fragments, phonemes, and formants churning much like the strata of red sandstone and greywacke that Hutton observed at Siccar Point.



Spectrograph of *(D)Evolution Mix* audio sample showing fragments, phonemes, and formants from Susanne Weins and Ralf Peters. Douglas Quin, 2023.

This is but one example of how working with sound gathered on location is inspiring a number of ideas regarding the aural identity and compositional or sound design strategy for *STRATA*. The key moving forward in post-production will be creating a unified "sonic stratigraphy" that layers and combines the various voices of all the participants and the reciprocal resonances of each cave with the visual construction and sequencing of imagery.

7. The Lighting of *STRATA*

By daz disley

this environment.
these hard surfaces.
this interface.
a forbidding welcome.

where I step is a negotiation.
every meeting-point of stone and body, a knife-edge.

this welcome is conditional.
for they will be here long after I am dust.
these stones.

the dripping of millennia.
and an encounter so slight.
at this interface.

they will not kill me, these stones.
but they will let me die here without a second thought.
for their concern is not of me, or of here, or even now.

but of the ceaseless fleeting accretion.
born of erosion, and deposition.

I am merely of these minerals.
maybe from these minerals.

but I will never truly be with these minerals.
as atom by atom, our encounter passes-by.

moves-on.

down-stream.

Layer by layer, digging down through strata to reach the bedrock on which my contribution is founded, I find copper, aluminum, phosphors, and lithium—a panoply of earths, both mundane and rare. Materials as deep-rooted in time as the locations containing the stories I am requested to illuminate—on the one hand, a seemingly simple request, and on the other, a complex dance of electrons and photons, blood and bone. I step out into the darkness, knee-deep into running water—fresh as it bites my skin, carrying with it traces of cave, and traces of time. The team is assembled and preparing to shoot, and as the strata of their bodies and various electronic devices begin to coalesce in a passing assemblage enchoired in the search for story, they are waiting.

Waiting for me, and getting cold, as I find myself as performer.

Filming *STRATA*. daz disley location scouting. Falkensteiner Cave. Photo: Fenia Kotsopoulou, 2021.

These surroundings are new to me, but older than I can rationally imagine, and my ad hoc audience looks on as I first cross the water, climb to find a platform, and begin to unpack my collection of now reassembled base minerals. We are in the mouth of a cave close to the edge of woodland, and I scan the surroundings for improvised mounting points, imagining potential cable runs, locating and demarcating what will be a temporary stage from which the search for this part of the story can begin. But nothing will be possible before a flood of photons brings clarity to the darkness and opens space for the material of the performances to emerge. The icy water seeps through my boots, reaching my toes to sting me as I locate an edge from which to pull myself up, reminding me of the energy and attention budgets I must diligently manage in the service of the story—budgets attendant to machines, and also to my body.

Weighed down by wetness, I climb a short way to place my first fixture, dirtying my hands as I thread my first cable. I surprise myself by my pace and have to double-check that the dark drop back down into running water neither injures me, nor derails the project. I move on, confident but tentative, the mantra of my peripheral awareness focused on the potential of an unseen stone—perhaps one waiting a thousand years for the opportunity to trip me up. Water splashes my face as I reorient myself back to my temporary base to find the next fixture.

The stones let me dance with them, as together we transit subtle balance points and I find permission to ease my way into relation with this environment. And more cold, and more wet; more energy expended, more time passing.

The sound of my boots plunging into the water ricochets around unseen back walls, as I head toward what might become a second fixture point. Higher than the first, above a shallow sandy bank, and requiring an underwater run of cable as its support. My striding becomes a scramble as I remember to count my points-of-contact in threading cable under, then over, around, and past. I am no longer aware of the passing of time, but instead of the waiting. Wet hands guide connectors into sockets, and I slide a potential explosion from its case. A few seconds to breathe, and a quick pause as I question my thinking, ticking boxes within my mental schematic. Did I miss something in my preparations?

Three clicks and numbers on a screen. Indicators: verification.

I look up from my improvised system to see first light, and I'm jolted into an oil painting of browns and greens, and reflections from microscopic crystal inclusions shimmering across the surface of running water.

Now we have scale and can begin to map spatial dimensions around the temporal core of the requests of the work, and within the space of what must have been perhaps fifteen minutes, I feel oddly at home, and I am ready to hold and mould space for the explorations of others.

Filming *STRATA*. daz disley lights setting. Location: Falkensteiner Cave. Film still, 2021.

In some senses, my research for *STRATA* never had a beginning, being instead another adventure in the rolling technical landscape of my arts practice. I make machines which make art—or at least systems which contribute to bigger creative pictures—each contraption informing the next, so locating my entry point is perhaps a little more diffuse than locating the invitation point for my contribution. As a team making a film, perhaps the best descriptor of our mode and approach would be one of "Guerrilla," and while funded, certainly not equipped with a burn rate enabling us to simply buy-in all of the specialist tools we might desire to shoot with in caves and tight passageways and in chest-deep water. So the performer in me, the improviser in me, the crazy inventor in me, would provide a response in the form of a custom-built lighting system, designed specifically for the context.

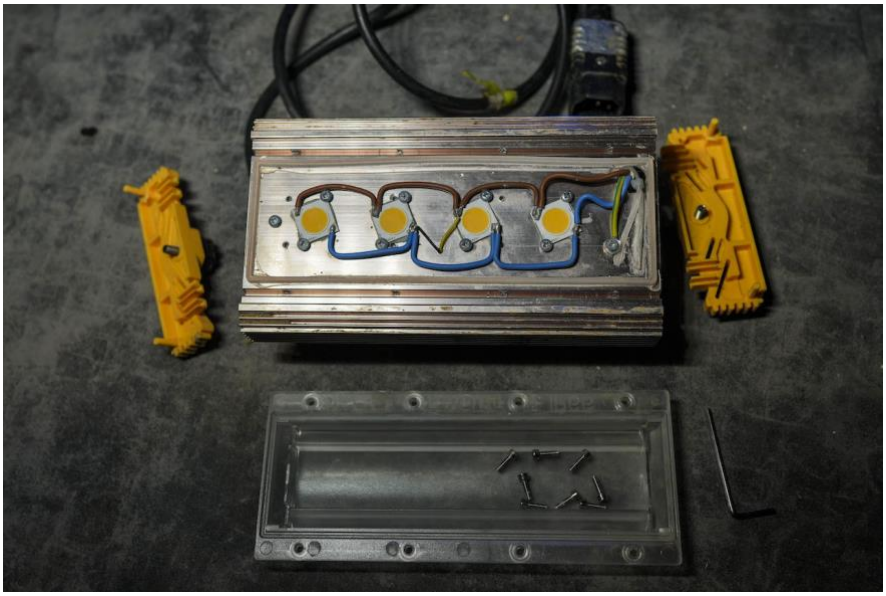
Custom-built lighting system. daz disley, 2023.

Formally speaking, my research questions centred on:
How much light might we need?
What colours of light might we need?
How long might we need light for?
How might everything be best packaged for safe and reliable use?

In pre-production dialogue, concrete answers to these questions were elusive, and we were quite literally in the dark as to how things might pan out. A supplemental but prominent question for me in this low-budget context revolves around the notion of how as a team we might "punch above" our nominal "weight." As filmmaking goes, our technical resources were admittedly modest, and so I was keen to make the best use of our (at-best) semi-professional cameras by providing the most generous quantity of the highest quality light I could. Thus, for me, it sits very naturally to reimagine the word research as "reach-search," as my search was concerned with how far we might reasonably be expected to reach given the limitations of both power and portability inherent in the idea of shooting low-budget in very tight, very wet spaces.

The sources deployed in illuminating my reach-search consisted of a small handful of websites, primarily the YouTube channel @bigclivedotcom, eBay, and several electronics product catalogues, including RS Components, Farnell Electronic Components Distributor, and Cree LED. I worked my way through the process of balancing materials costs with the resultant affordances of different potential configurations. The design I eventually alighted on for the fixtures consisted of repurposing cheap generic floodlight bodies by replacing their low-quality light sources with architectural lighting chips. This would offer an increase in power density along with a colour rendering index in the 90–95 range, with the aim of being able to capture tonal range sympathetic to both the environments we were to visit and the skin of the performers. Super important for shooting video is to avoid the flicker commonly created by torches and other consumer-level lamps, which use modulated power signals to take advantage of our persistence of vision in order to reduce power consumption. So I had to find a way to provide continuous power, and to do so at safe voltages near/under water while maintaining ease of portability.

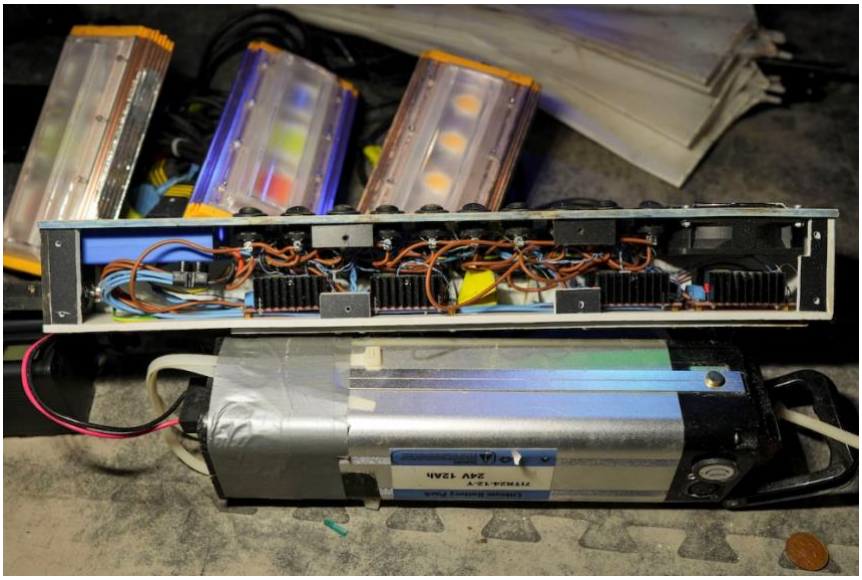
Cheap generic floodlight. daz disley, 2023.



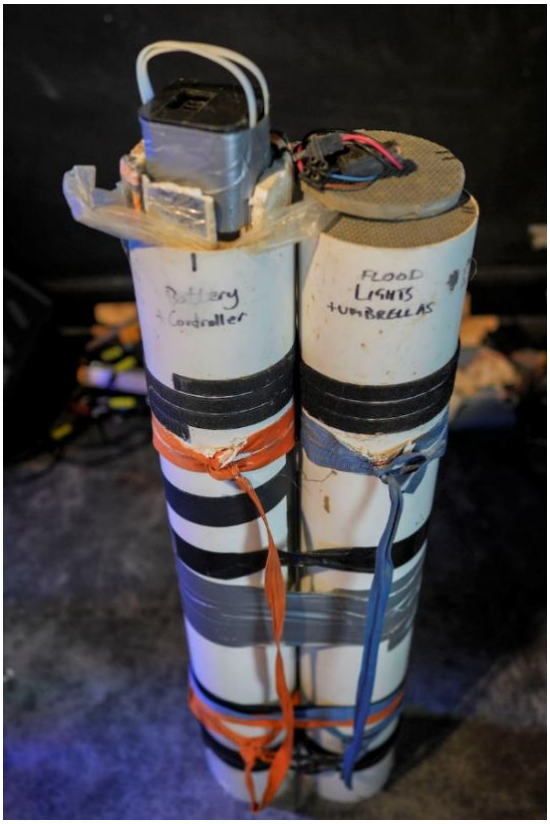
Cree chips. daz disley, 2023.

Finding the solution to the question of power source was perhaps the longest part of the search during design and construction, and I was delighted to eventually stumble upon electric bike batteries, pre-packaged in tough aluminum shells capable of taking a bit of a beating, and if not truly immersible certainly geared up for use in the wet. But these items together solved only half of the problem. To enable a level of control over multiple fixtures, I built a slimline switchbox from plastics repurposed from a previous project, including a power meter, which might help in estimating battery life and therefore possible shooting durations. The final part of the puzzle once the equipment had been assembled was the question of transportation, and how to safely move through an environment of hard surfaces and much water. At some point during pre-production conversations, the use of plastic pipes for protecting cameras was mentioned, so I dug further into this idea, and fashioned a pair of rucksacks from lengths of toilet waste pipe lashed together with webbing and plugged with foam floor tiles, again leftover items from previous projects. To my delight, once fully loaded they were not only watertight enough to survive immersion, and tough enough to withstand being crashed into rocks, but also contained sufficient air to remain positively buoyant, which enabled us to float the equipment into the cave.

Switchbox. daz disley, 2023.



Battery and controller. daz disley, 2023.



Rucksack. daz disley, 2023.

Half-naked in the dead of night adopting a deep side lunge. My left knee rests on a submerged rock as my right leg stretches out over the stream bed balancing my weight on tiptoe. My chest hovers over the water, torso hinging forward from the pelvis. I bob-down under the view of the main camera, head tilted up with shortened neck as I lock myself into position for the scene. For twenty minutes I maintain this position, cold air flowing over my skin dragged along by the rush of the water, the lens of my camera positioned barely two centimetres above the water's surface. Skeins of hair removed during the action slip into the water, and drift toward and then under my lens. I no longer feel the cold and have lost contact with the sensation of the water. The invisibility of the endurance of my performance consists of pulling focus. Focus on and within the scene. Focus on my stillness. Focus on holding my attention with and for the performers. A

performance both for camera, and with camera, from both front and behind, as many strata of collective trust enables performative flow to encircle us all.

My reach-search for *STRATA* is part of a bidirectional composition traversing many strata of object-material boundaries through time. Object of stone giving way to material of mineral giving rise to object of component composing material of modules combined into object of illumination shining light on material of performance as object of gaze registering material of editing birthing object of film opening space for material of philosophy and further object of discourse. It is a journey spanning uncountable time, both in conception and in reification.

Some two hundred metres underground, beyond a low ceiling passable only by accepting the icy offerings of immersion, I am standing up to my chest in water and have been here for some time. The shot has just finished and the performers have hastily departed back to remedial offerings of towels and hot tea. Beside me is Doug, hand extended to take my camera so I can reach back to the relative safety of a muddy ledge. We hastily de-rig, packing our cases with numb fingers in preparation to again be confronted by immersion. But this time a dual immersion of both water and pitch blackness. Around us the empty hollowed-out silence of wet rock. We are now truly alone, without even our cave guides, and a peculiar, almost ominous, peace descends.

What is left in the now low budget of my blood sugar? Is there enough there for me to reach back out?

Before, and as a team, we had the psychological comfort of safety in numbers, but only now as a duo the true scale of our relationship to these passageways emerges. I am utterly insignificant to the flow of water here, and therefore to the flow of time. Nothing more than a thin leathery bag of diluted minerals in the face of the apparently immovable certainty of the rocks. The only signs of life other than Doug or myself, the muddy guano left by bats overwintering for millennia. The welcome this place has extended us is retreating, and at a pace hard to quantify. For a fleeting moment, I am tempted to dwell and submit to the inevitable comingling of my inner minerals with those all around us. I know not from where came the impulse to kick, but as my back foot re-establishes balance with the buoyancy of my luggage, a fresh wash of cold sluices its way across my chest, further motivating me back into movement. Through passageways and round corners, the depth of water subsides, and from somewhere I again find more pace. Emerging from the final point of immersion toward the exit, and as natural light starts to overpower our head torches, I become aware of vapour. First as a result of my breath, and then further diffuse wisps rising from my body.

Strata of hard and cold give way to layers of heat and soft. I smell the trees as my eyes adjust, and I am enveloped by the warm embrace of my collaborators. Through the illumination of my geological insignificance and the balancing of budgets external and internal, I verify my own materiality.

moving-on.

down-stream.

at the interface of these mutable surfaces.
atom encounters atom.

and I will never not be these minerals.

Filming *STRATA*. daz disley glaring lights. Location: Falkensteiner Cave. Photo: daz disley, 2021.

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Notes

1. The film *STRATA* is currently in post-production. It will premiere on February 4, 2024, at the Altered States Film Festival, The Hague (NL). The significance and context of this research project and its findings can be partly described in words, although a better understanding is gained by looking directly at the outcomes. The present text is therefore accompanied by audiovisual documentation comprising models, diagrams, and voice and sound recordings. For more information, see https://www.STRATAfilm.de.

2. Hutton's concept of time was refined in the mid-twentieth century when it became possible to date rocks accurately using radioisotope decay.

3. As a section of the film *STRATA* website, the *STRATA* Knowledge Archive is an actual archive housing the video recordings of the conversations we had with archaeologists, speleologists, cultural scientists, philosophers, art historians and artists who inspired the construction of moving images. Navigating real and possible worlds, they examine complex systems, deep time, evolutionary consequences, the new and the unexpected, layers in the history of humankind and the role of art therein, questioning and deconstructing codified narratives and aesthetics. See https://www.stratafilm.de/knowledge-archive.

4. One of the primary challenges of caving, or spelunking, is navigating through tight spaces. It is an inherently dangerous activity, which often requires contorting, twisting, and bending the body in unusual ways, placing stress on the joints and muscles. Traversing the Gustav-Jakob Cave, the almost constant pressure of sharp rocks against the body would scrap the skin, causing cuts and abrasions. Inside the

Schiller Cave, although always relying on artificial light sources to see, the limited visibility inside the funnel makes it challenging to identify potential hazards, such as unstable, slippery slick stones. A single misstep can lead to injury. We were always in a heightened state of awareness, alert and sensitive to every nuance of surface and gesture.

5. In his studies of comparative religions, Mircea Eliade (1959) explores the notion that the Earth has no beginning and no end and time and the universe are cyclical, formulating the myth of eternal return.

6. *STRATA* Knowledge Archive: Anguezomo Mba Bikoro. https://vimeo.com/710374901.

7. Wilhelm Hauff's novel *Lichtenstein* (1826) and the Nazi research program "SS Ancestral Heritage" complicated geology's detachment from the region's factual historiography.

8. In a conversation with Neil deGrasse Tyson, Hawking said, "I adopt a Euclidean approach to quantum gravity to describe the beginning of the universe. In this, ordinary real time is replaced by imaginary time, which behaves like a fourth direction of space. In the Euclidean approach, the history of the universe in imaginary time is a four-dimensional curved surface like the surface of the Earth, but with two more dimensions… The boundary condition of the universe is that it has no boundary. In order terms, Euclidean space-time is a closed surface without end, like the surface of the Earth" (Hawking 2018, 14:58–15:47).

9. I refer to the rites of passage described as transitions by ethnographer Arnold van Gennep (1960). Liminal rituals known as rites of passage occurred in three stages: separation of the actors/participants from ordinary social life; trespassing the margin, limen or threshold—the actors fall into a limbo between their past and present modes of daily existence; aggregation—the actors of the rite return to mundane life after having experienced an altered state of consciousness (Turner 1979, 465–66).

10. I was born and raised in Venice (Italy), a city where we Venetians are used to saying that there are more churches than houses and where the passage of time is marked by the resounding and tolling of dozens of bells every fifteen minutes the whole day.

11. Timothy Morton's theory of hyperobjects refers to things massively invisible and distributed in time and space relative to humans. Hyperobjects are so large and complex that they are difficult for humans to comprehend or experience fully. Examples of hyperobjects include climate change, nuclear radiation, and the internet. Morton argues that these objects are not just physical entities and have a profound impact on our lives and ways of thinking.

12. For Bohm, the universe, although it appears to be solid, is, in essence, a hologram where every part of physical reality contains information about the whole and is characterized by a dynamic interplay of order and chaos. Everything is interconnected in a constant state of flux.

13. Memories are created through the process of encoding, consolidation, and retrieval. Encoding refers to the process of transforming sensory input into a form that can be stored in the brain. Consolidation is the process by which memories become stable and long-term. Retrieval refers to the process of accessing stored information when it is needed. Various factors, including emotions, attention, and rehearsal, can influence memories. They can also be subject to decay or interference, leading to forgetting or distortion of information over time.

14. Long-term memory is a complex, multifaceted phenomenon that involves the encoding, storage, and retrieval of information over extended periods and can be influenced by a range of factors, including emotions, attention, and context, which makes it challenging to conceptualize.

15. *STRATA* Knowledge Archive: Nicola Fornoni https://vimeo.com/712773514.

16. Flowstones are speleothems that form when acidic water (rich in calcium carbonate collected from limestone rocks) flows down the walls or along the cave floor, depositing layers of calcite. They are typically found in solution caves, which are part of karst geology, and formed when the acidic water seeps into small cracks—dissolving the rock it touches and expanding the crack into a cave. As time passes, the cave grows.

17. The olm (*Proteus anguinus*) is a urodele amphibian, an aquatic salamander belonging to the Proteus genus. It is the only troglobitic vertebrate which lives and reproduces exclusively in caves, present in Europe.

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