

Imagining Life

Amy Karle's Artistic
Research Practice

n i n g



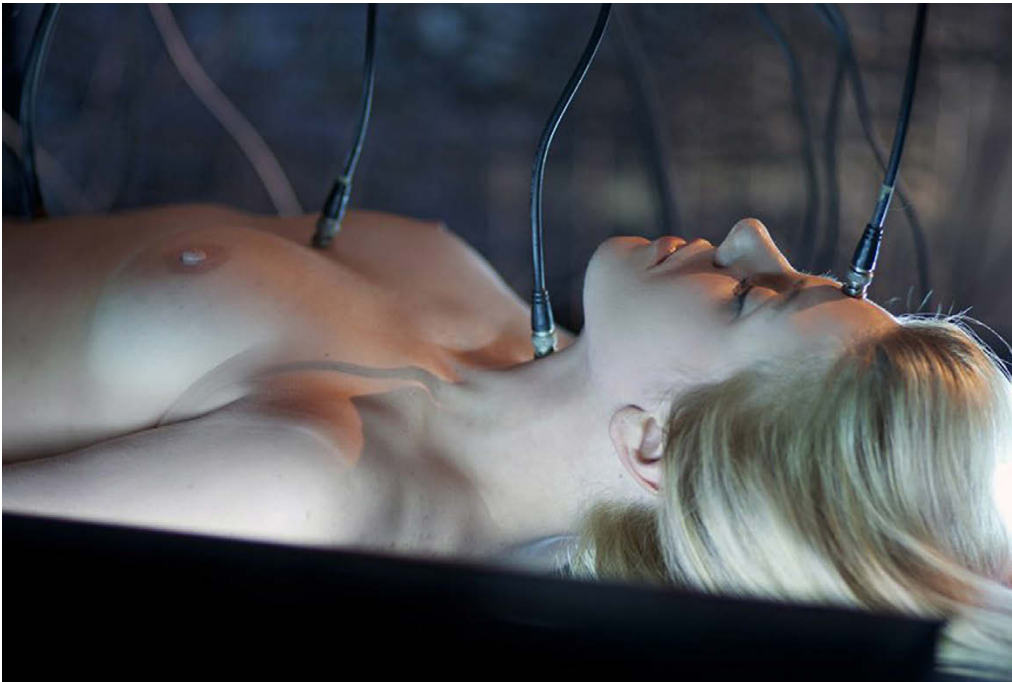
The text ›Imagining Life‹ is based on a conversation with Amy Karle.
The authors want to express their gratitude for the deeply
inspiring encounter and for Karle's support of the Atlas of Databodies.

Artworks and descriptions: Amy Karle
Text: Marlene Bart, Alex Leo Freier

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› Biofeedback Artwork ‹



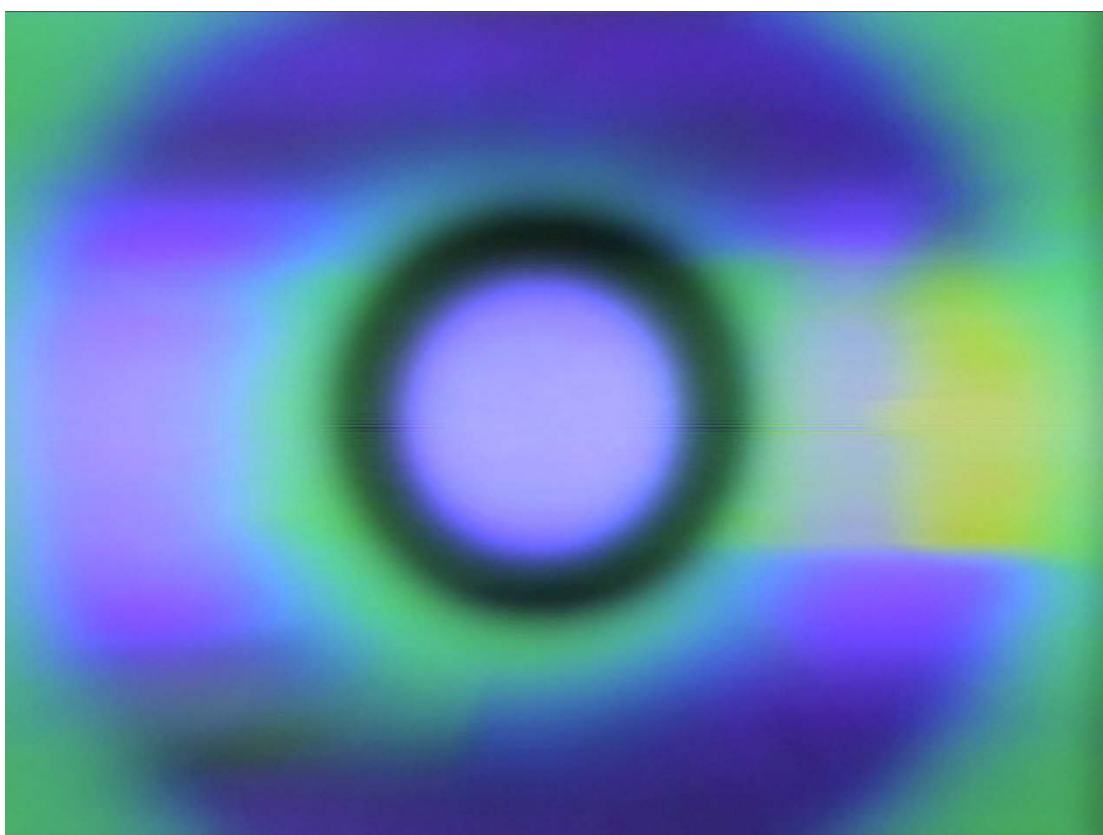
Amy Karle connects her body and consciousness to technology to create art, repurposing a Sandin Image Processor as an electro-physiological visualization device. While meditating, Amy Karle inputs her biofeedback into the historically significant Sandin IP analog computer to generate the output of image and sound in real-time. The artwork is both the long-duration performance as well as the experimental video art that is created in the process.



2011

Documentary made with support
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of the Arts.

Photographs by Andre LaRoche, Stage 3

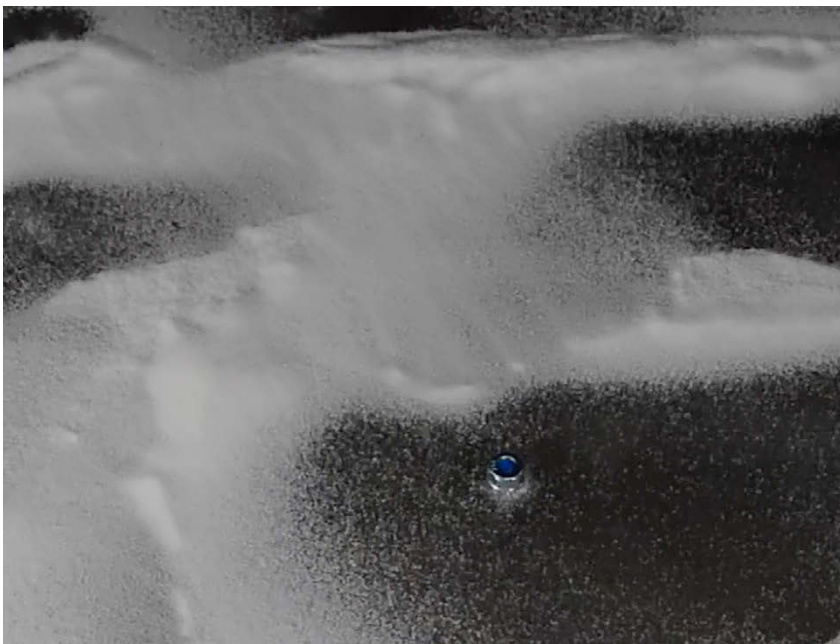


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› Resonation ‹

Connecting her body and brain to a subwoofer and Chladni plate, Amy Karle turns bioinformatics into cymatics, generating bio-signals into visuals and sounds. Frequency adjusts with changing brainwaves, the sound is heard in Hertz though a subwoofer which vibrates a metal plate above it depicting the communication of vibrations and the symmetry of sound.





2015

Performed at Signal Culture
in New York.

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Bioart and the body

Amy Karle's exploration of the human body breaks with conventional conceptions of corporeality. She confronts us with hidden rhizomorphic connections beneath our skin, aspects of spirituality, and the ever-advancing technical progress in human medicine and our environment. She questions our personal relationship to our bodies and lets us wonder if the way we connect to our own physicality has changed in the 21st century. The human body is Karle's investigative starting. From there, numerous parallels can be drawn to the basic concept of the Atlas of Databodies and this volume's fundamental thoughts.

What fascinates Karle, especially with regards to the human body, is the contradictory potential of technology. For a long time, technology has sparked hopes in a better future. Automation promises prosperity and it has increased the living standards in industrial societies in the last centuries. But at the same time, technology has opened possibilities of danger and perdition. In art, it is possible to negotiate inescapable questions as well as utopian and dystopian future scenarios. But how does the convergence, mixing and reconfiguration of organic and artificial bodies affect our definition of what it means to be human?

In relation to the significance of illness, healing, and technology within her biography, Karle exposes philosophical lines and nodes around the human body and its fragility. Her works are hybrids that embrace artistic as well as scientific methodologies. As such, she can be described as one of the most relevant representatives of Bioart. According to Gerhard Gramm, Bioart as a genre takes on a hybrid form. One characteristic of it is the dissolution of boundaries («Entgrenzung») and intermingling («Vermischung») of biotechnological and artistic practices, reminding us of the interconnectedness of science and society while considering their mutual acts of infiltration (Gramm 2007: 42–43). This conception of Bioart could be seen as part of a larger discourse about the boundaries-crossing process that defines contemporary art practices (Rebentisch 2013: 25). By taking artistic initiative into technically dominated environments like laboratories, Karle fosters that process of interpenetration. It contributes to the vast impact of Karle's works, which are not only technically fascinating, but also emotionally touching.

Science: A formula for imagination

Looking at the historical dimensions of science and technology, both can be conceived as taking part in a history of imagination. In the early ages of humanity, the explanations for natural phenomena that we have today did not exist. We needed to use our imagination to describe what we were seeing in the world around us. At one point in history, as Karle elegantly states, we constructed »formulas for imagination« resulting in the scientific method. Parallels can be drawn to Karl Popper's principle of falsification, which intends to test the empirical limits of science. According to Popper, a hypothesis can never be proven, but it can be disproved if necessary. Believing in the principals of the scientific method is important. But the best scientists do not just rely on methodology – they possess an open mind. There is a dynamic relationship between objectivity and imagination. The very idea of a scientific experiment already encompasses that. An experiment, in theory, has an open outcome. One might say this notion is analogous to the ideal of the freedom of art. This freedom is what makes science, too, so progressive and what has led to many of the most impactful scientific innovations and discoveries. Far from delegitimising science, this means to support and enrich it by embedding it into a broader history of imagination.

This context is relevant to Karle's artwork as it is often defined as »science fiction«¹. The artist points out that, like herself, a lot of science fiction authors drew their knowledge from real science. In some of her pieces, Karle works with state-of-the-art stem cell research. She says that she likes to listen to museum visitors react to her artworks while they are unaware that it is the artist herself standing next to them. Peoples' judgments on her artworks range from »scary« to »beautiful«. Karle agrees that this is precisely the range that she is drawn to. In other words, the realm that she investigates is not simply the beautiful, but the sublime. She displays phenomena that put us in awe of natural creation, which in itself cannot be grasped in simple terms, but is beautiful and scary at the same time.

As for »science fiction«, her works should not be seen as mere materialisations of utopic or dystopic visions. The dangers that she points to are just as real as the science she works with. Be it the climate crisis or instigation through social media – it is important to carefully watch the negative side effects of technological innovation. We need to gain a realistic stance

¹ A term used by Donna Haraway (2016: 2) with the intention of describing a new epistemological mode given the rising interconnection between technology and nature.

towards science, but at the same time, we should explore deeper dimensions that are impacted by it. Karle does so by the means of her artistic practice. Scientists and artists can take on a political role. Karle, who fulfilled the role of an »Artist Diplomat« through the U.S. Department of State, argues that even if politicians fail to maintain diplomatic relationships, countries also have artists and scientists who are able to connect and keep ties on a different level. They can keep the cultural relationship alive, no matter what happens politically. Nevertheless, science bears not only potential dangers as well as the corresponding antidotes, but can also be progressive and fulfil the utopic dreams of humankind. A prosthesis, for instance, is a blessing for those born with disabilities or who have lost a limb to accident or disease.

Technology further unites art and science through the use of imaging processes and techniques. A connection of visualisation practices can already be seen since the use of drawings in scientific publications and in the latest innovations since the widespread adoption of photography. The advent of digital formats makes access to visualisation much more democratic, for example in the field of 3D scanning, modelling, and printing. In many of her works, Karle uses 3D printing methods. She argues it is important to use state-of-the-art technologies to their widest range of possibilities. There is nothing wrong with 3D printing a mug, but in terms of her own work using the technology, she notes with humour that humans have developed very elaborate techniques to make pottery in the course of thousands of years. Creating a 3D structure on which stem cells can grow, in contrast, brings whole new possibilities of application.

Karle investigates these possibilities in her 2019 piece *The Heart of Evolution?*. In the aesthetics and staging of the work, visual aspects of medical laboratories, mysticism, and art are intermingled. A 3D-printed organic grid structure shaped like a human heart sits in a cylindrical glass that is reminiscent of wet specimens from medical history museums. The plastic-like material catches the eye with its garish neon pink colour. This stark colourfulness is underlined by a luminous rim at the top of the vessel. The heart is not solid; it does not consist of printed plastic shells as in anatomy models that we know from medical schools or hospitals. Instead, Karle adopts a net-like structure that leads to an increased flexibility and mobility of the object. Only the stretchability of the material avoids an interpretation as a skeleton or an ossified heart. Using biomechanics, a beating, a throbbing, a trembling of the heart is generated.

No organic or living materials were used for *The Heart of Evolution?*. However, the image of the human heart is one that, more than any other organ, implies fundamental aspects of life. In German colloquial language, the word »Pumpe« is

occasionally used for the heart. The colloquial phrase »Da geht mir die Pumpe« means that the blood rushes through the heart. It beats faster. The English language also describes the heart's motion as pumping. This term is purely mechanical. At the same time, this organ is a symbol of our emotions and, thus, so much of how we define the uniqueness of the human species. By posing *The Heart of Evolution?* as a question, Karle confronts us with the general question of »artificial«, man-made evolution and asks what keeps the evolution of the species, but also of the spirit, going at its heart.

Religion: A root of imagination

Besides societal and political implications of science, Karle's artistic research revolves around its inherent limits. From a very young age, Karle was confronted with illness and death. She was forced to ask fundamental questions that many people do not have to face until they are much older. What does it mean to be alive? What does it mean to be human?

We can measure if a heart is beating, if somebody is breathing, or if a brain cell is alive or dead. But there are other realms of the human experience that tools of scientific measurement cannot capture. These are realms that are usually associated with religion or more simply, belief. Regarding religious or spiritual practices, there are diverse motifs that create a backdrop for Karle's work. She cites her Catholic upbringing as a fundamental influence. In Christian theology, the body of Christ is a central theme. Karle recalls her childhood memories of seeing Christ's crucified body every Sunday in church and the meaningfulness of the liturgical practices of »eating the body« and »drinking the blood«. In contrast to science as a formula for imagination, traditional religion can be seen as an archive storing past fantasies and memories that accompanied the cultural evolution of the species.

Later in her life, Karle pursued a degree in philosophy, focusing on relativism. She says this background informs her thinking to always consider a wide range of possibilities: in any technology that is being developed, there is an opportunity for a best and highest good, but also for complete and utter destruction. Hence, ethical reflections are clearly present in her work as an artist. At one point in our conversation, Karle spoke of artists and ethicists synonymously. Always carefully listening to the moral and ethical compass inside of her, she reminds us of the long history of exploiting the body – both human and animal. From unpaid care work mostly carried out by women to

»From unpaid care work mostly carried out by women to the commercialisation of the female body to the role of slavery – these examples of exploitation are just some of the reasons for her choice to work with her own body.«

the commercialisation of the female body to the role of slavery in building modern American society – these examples of exploitation are just some of the reasons for her choice to work with her own body. When working with cells, she collaborates with living human donors, instead of using animal cells from creatures who cannot consent. Also, when considering body enhancement – or even healing – Karle comes up with ethical issues. Regarding inventions in the medical field, first, intentions are sincere. Transplants should be given to those in need, and those with disabilities are sought to be healed. But sooner or later questions arise such as, »Who should be able to access it next?«

Lastly, there is one ancient religious practice that especially influences Karle's thinking about the body and technology: meditation. It is a way of connecting to the body. Karle has a regular practice of simple breath meditation, she says. Breathing is like the throttle between the conscious and unconscious. Through the rhythm of inhaling and exhaling, and ultimately through the concentrated focus on the pulse, body and mind connect.

Karle regularly uses a float tank, a sensory deprivation chamber. As a salt bath, it takes the weight off the body. Bathing in it is very restful and healing to the body and the treatment can even be found in hospitals. Karle, however, uses the technological device to help her meditate. It allows the brain hemispheres

to synchronise in a way that cannot be achieved in any other environment on earth, so it makes it possible to attain high levels of meditation quickly. If we can visualise something in meditation, we are much more likely to achieve it. As a person who learns more effectively through visual and bodily stimulation than auditory and through reading texts, Karle works with technologies in a way that suits her needs. She questions how we use technology to support us. How we interact with nature is crucial to our experiences. Instead of trying to harness nature and make it do something, Karle tries to say, »What can I learn from you?« and »How can we work together?« So instead of using advanced tools and only focusing on them, Karle provokes the »why« behind it.

In her artistic practice, the use of complex technologies is therefore always connected to emotional and social, but also to spiritual points of reference. Besides *The Heart of Evolution?*, this approach can be found in *Regenerative Reliquary* from 2016. For this work, the phenomenon of implants and transplantation was a crucial starting point, as well as the question of artificial cell growth and what its future development could look like. The work presents itself to us on a pedestal, embedded in a darkened setting that lends an air of mysticism. From this emerges a luminous apparatus composed of conical flasks, tubes, cables, mechanics and, the most striking element, a glass container shining

from the inside. Inside the container, surrounded by air bubbles, is a yellowish object in the shape of a hand or, to be more precise, a stylised hand skeleton. It is based on a 3D scan that Karle made of female hand bones, their size corresponding to her own hand. This implies a conflation of the idealised notion of the artist as »genius« – a projection that is increasingly dissolving in modernity, and thus also of the »artist's hand« and the concept of the reliquary.

Even though we are confronted with the aesthetics of a laboratory, relics are usually familiar to us from other contexts. They are traditionally religious cult objects that contain remnants of saints. Aside from full-body relics, it is just as common to see an arm, hand or foot as a relic. The reliquary is a phenomenon that transcends religions. In Europe, these cult objects are mostly found in churches or religiously defined spaces. While the relics found there are always human remains and vanitas symbols to which healing powers are attributed, traces of life can be seen in *Regenerative Reliquary*.

The Latin term reliquiae means »remains«. Remains are simply what gets left behind. In this context, Karle's hand indirectly refers to the leaving behind of classical artistic conventions and yet, through the aspect of the »regenerative«, opens itself up to future possibilities.

Dreaming: A form of techno-imagination

Just as meditation, dreaming is a state between consciousness and the unconscious. Karle tells us that she is sometimes able to control her dreams. Dreaming is not merely fantasising something unreal. In contrast, it is a real state of consciousness. Dreams inform our real life and thus are more entrenched with objective, material reality than we initially consider. This is also the case in historical dreams. For instance, in the times of industrial revolution, contemporaries dreamt of a better future and imagined how new technologies would bring peace and prosperity to the whole of society.

This promise might not have been fully realised, and the way to progress has been far more meandering and errant than naively expected. A romantic vision was painted for the future, yet this future has not materialised. Today, we have the computing power to solve problems like world hunger and malfunctioning financial systems, but we are not using it that way. We have the tools to work a minimal amount of time, yet we spend more time at work than ever, glued to our computers instead of letting them work for us.

The progress that we have made so far came at a high price. Starry-eyed, mankind – and maybe not the whole of humankind, as Karle points out with a laugh – has stumbled into one catastrophe after the other. Utopian dreams can quickly turn into nightmares. And even now, looking at former industrial metropolises, one cannot help but feel that they were hit by war. Huge factories and housing buildings crumble to abandonment. The sheer decay of the ruins that industrial glory left behind give a palpable impression of the seismic devastation to which the unleashing of industrial forces has already led and may yet lead. Practically speaking, Karle looks at the range of possibilities that come with technology and especially with biotechnology that has the same scope of potential – »We can use it for our benefit or we can use it for our demise, and it's up to us to ask those questions«, she tells us. Thus, as much as we have to overcome simple romantic and idealistic visions of technology – the idea that it will inherently bring peace and prosperity to all parts of society equally – we have to keep our imagination alive. So Karle concludes that today's techno dreams and visions have to be informed by the past. It is critical that we recognise what worked and what did not work and why, have a clear grasp of the present, and still hold on to a hopeful vision for the future.

In our vivid conversation, we reflected on technical images and their significance for communication as defined by the media theorist and philosopher Vilém Flusser. He distinguishes traditional images from technical images. In contrast to classical oil paintings, these are produced by apparatuses. They are therefore based on a technical, automated process and demand a different kind of imagination (Flusser 1983: 13). Flusser refers to the necessity of the ability for so-called »techno-imagination«. Through this, images produced by apparatuses are to be deciphered. He also hypothesises that this ability is radically different from traditional imagination (Flusser 1983: 153). What the contemporary world lacks is the ability to forge new visions that keep up with the current stage of technological development. Technical images are nevertheless indirectly connected to us humans. In a similar way, tools can be an extension of our senses. Karle creates technical images in her works and in the process, a path to new kinds of techno-imagination opens up.

The work *Biofeedback* from 2011 comprises a multimedia performance that brings the artist's body into direct dialogue with technical images. Karle connected her entire body to an apparatus that generated images and sounds based on physical activity. In doing so, she created a kind of electrophysiological

visualisation device. The duration of this performance was five to eight hours, during which Karle, lying on a table and connected to the apparatus by cables, visualised energetic signals from her body in a meditative state of mind. Due to the resting state of her body and the duration of the performance, the dynamics of the visualisations and thus also of her bodily functions became clear, despite the low level of activity. In this sense, Karle draws a fluid and unquantifiable body image. *Biofeedback* also raises questions about the way we learn, or more specifically, how our body learns. The performance constructs a momentum of implicit learning and implicit knowledge. In this sense, it is not a communication based on written language, nor a memorisation of facts, but a permanent interaction of her body with the connected machine.

Science and technology can sometimes limit imagination, because we think we know, we think we have reached higher knowledge, but we are actually just at the beginning of exploring that knowledge. Michael Polanyi did extensive research on »tacit knowledge«, i.e. knowledge that is not language-based. He described tacit knowledge as the fundamental instrument through which all intellectual and practical knowledge of the world is gained. Only through this intelligence, does our body become a body, an instrument beyond its status as an external thing (Polanyi 2016: 23–24). In this respect, Polanyi understands tools – and therefore new technology – as acquisitions of the body.

Karle's work brings us closer to this understanding of technology and does not treat them as processes cut off from our bodies. Listening to her speak, you immediately feel her passion for her work and her admiration of the phenomena she deals with. Just as her artistic works, Karle's insightful thoughts dissolve common boundaries between the real and the imagined, between science and religion, or between dream and wake.

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Amy Karle is an internationally award-winning bioartist working at the nexus of where digital, physical, and biological systems merge. She attended Alfred University and Cornell University, where she received degrees in Art and Design and Philosophy. Karle has shown work in 54 international exhibitions, including at: The Centre Pompidou, France; The Mori Art Museum, Japan; The Smithsonian, USA; Ars Electronica, Austria. She was honored as one of »BBC's 100 Women« and has been named one of the »Most Influential Women in 3D Printing«.