

May 13 – August 27, 2024

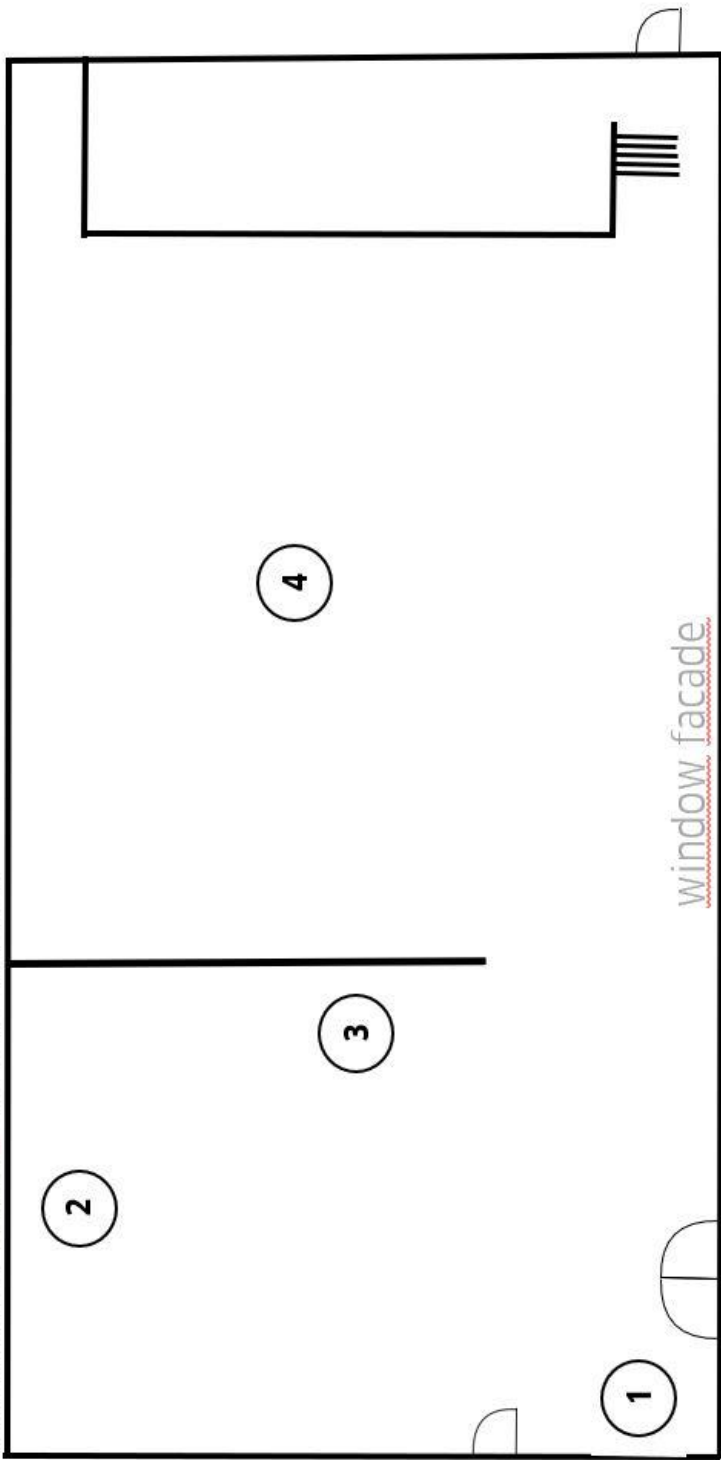
THE NEXT RENAISSANCE

LE GOÛT DE L'INVISIBLE

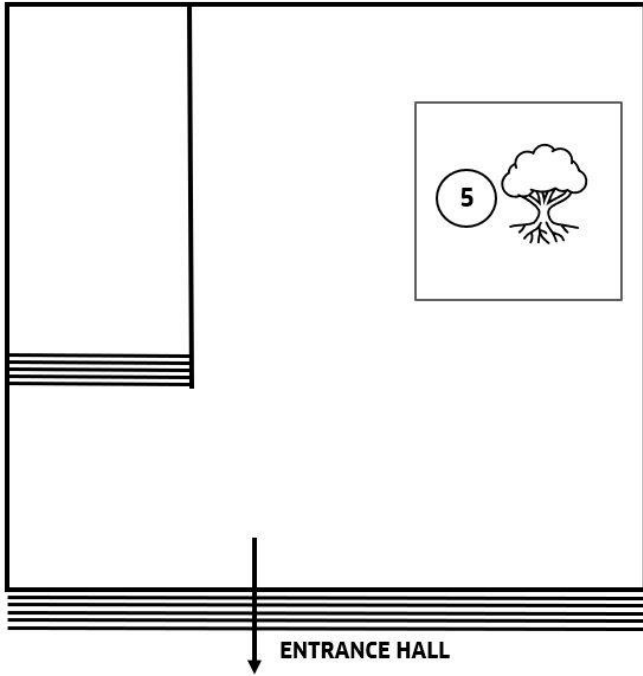


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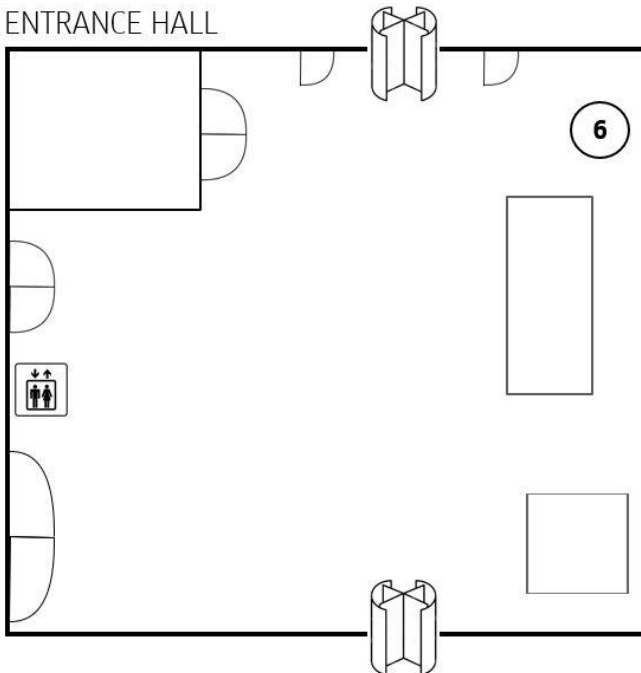
EXHIBITION SPACE GROUND FLOOR



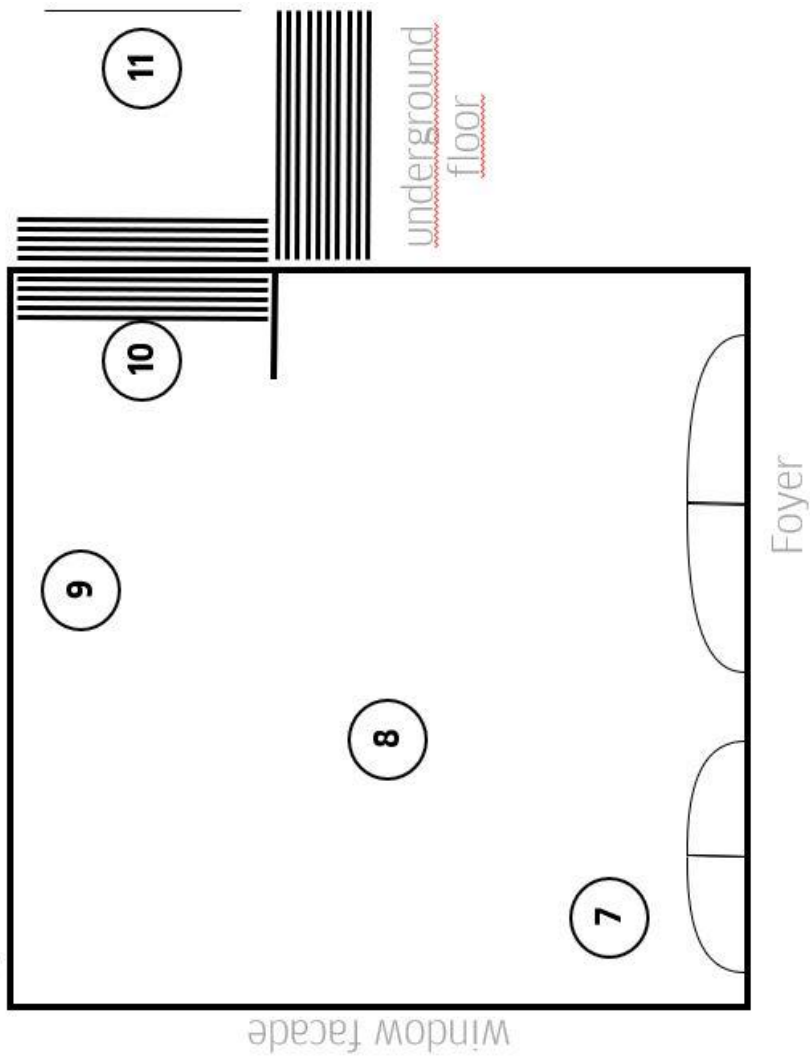
COURTYARD



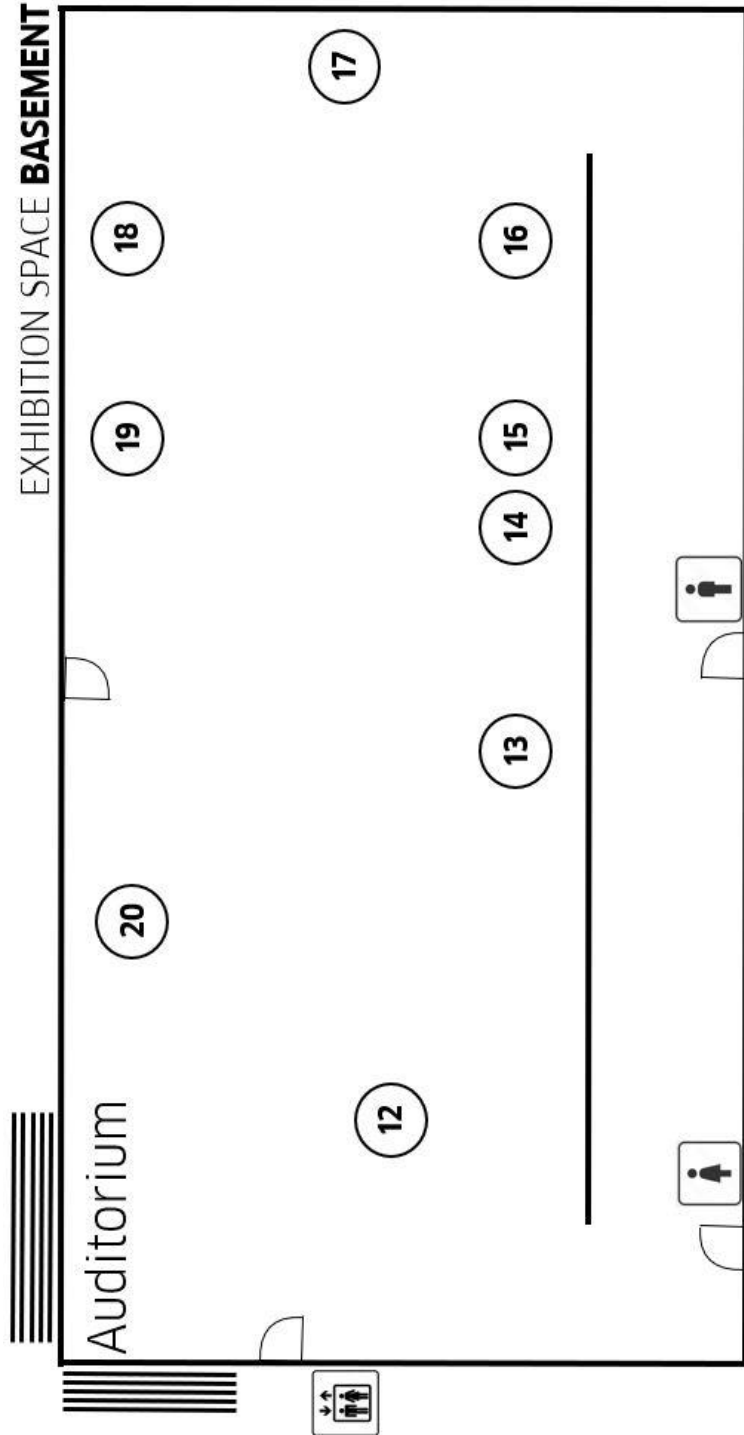
ENTRANCE HALL



AQUARIUM GROUND FLOOR



EXHIBITION SPACE **BASEMENT**



THE NEXT RENAISSANCE

LE GOÛT DE L'INVISIBLE

The promise of a next renaissance is grounded on the idea from the awakening which took place in the early modern age that art, science, and technology will combine to form a new common sphere of world creation. The interplay of different fields of knowledge and action leads to momentum that spawns the new. Relationships between mediality and perception, between the organic and technology, between humans and nonhuman entities are modeled.

Whereas the principle branches of knowledge in the European Renaissance were mathematics, optics, anatomy, astronomy, and nautical science, today they include medicine, biochemistry, computer science, and artificial intelligence. The fourteen media artists represented in the exhibition either have a background in science or collaborate with scientists from these disciplines.

THE NEXT RENAISSANCE offers insights into the micro- and macrocosm, into biological, social and artificial contexts, and addresses dreaming, thoughts, and the dialogical principle. Art that operates with data is interested in more than just presenting facts. It is interested in ideas or models that are oriented on better understanding the world.

LE GOÛT DE L'INVISIBLE was chosen as the subtitle of the exhibition because it brings up a fundamental paradigm of the relationship between science and art today. The subtitle quotes the title of a landscape painting by René Magritte. Like the surrealists, the science-artists have a taste for the invisible. While the early avant-garde focused primarily on what the unconscious produced, the media artists target other methods of dissolving boundaries. The invisible is that which eludes the anthropological dimension – due to immateriality, dimensioning, distance, and velocity as well as physio-optical inaccessibility or sociocultural blindness. *THE NEXT RENAISSANCE* presents artistic ventures that demonstrate how these large-scale complexes can be approached in a creative way.

Anett Holzheid, curator of the exhibition, ZKM | Karlsruhe

ZBYNĚK BALADRÁN

MODEL OF THE UNIVERSE, 2009



Video, color, sound, 2:46 min.

The first words spoken by Czech artist and curator Zbyněk Baladrán in his video seem to have sprung from the dream of a Renaissance man or the literary imagination of a Jorge Luis Borges: »I'm interested in an exhibition as a model of the world.« The diagrammatic drawings created by the artist's hand and the enumeration of the disciplines involved in capturing reality confirm that one consistent view of the world is an impossibility of and that humans have a compulsion to create models.

The contradiction between a multiplicity of signs, without which neither communication nor orientation in the world is possible, and a complexity of facts pulls people into a constant stream of questions and doubts and leads to the never-ending progress of knowledge.

For all its philosophical inquiry, the video is not lacking in humor. The artist, symbolizing humanity, resembles a cave dweller designing rudimentary signs and symbols. As producers of worlds and architects of human consciousness, the sciences and the arts oscillate between controlled problem-solving and the open horizon of the unexplored.

This video work, which opens *THE NEXT RENAISSANCE* exhibition, is an inspiring entry point, and at the same time contemplation and ironic self-reflection.

HELEN PYNOR

93% HUMAN, 2023

2

Video, color, sound, 20:40 min.

Helen Pynor's artwork *93% HUMAN* explores the multispecies nature of being human, the promiscuity of DNA, and DNA data as a generative tool, through an investigation of DNA we exhale in our breath and inhale from others.

A performance video depicts Helen Pynor and genomics scientist Jimmy Breen breathing into a scientific glassware condenser device, which converts their gaseous breath into liquid, rendering what is normally imperceptible into visible form. DNA from this shared breath sample was sequenced and analyzed in Breen's laboratory and found to comprise 93% human DNA with the remaining 7% belonging to around 6,700 identified microbial species. These genomic traces provide forensic-like evidence of a presence, giving form to these usually unseen microbial cohabiters.

Pynor and Breen's performative actions highlight the intimacy of our unnoticed exchanges with human and non-human others, and »contamination« as a necessary condition of being.

Using the taxonomic names of the human and the microbial species whose DNA was present in the breath sample, composer Amanda Cole has created a polyphonic, microtonal choral score for eight classically trained singers, who use their own respiratory tracts to sing and whisper this multispecies community, presented as an eight-channel sound work.

Lead collaborators: Jimmy Breen, bioinformatician and geneticist, chief data scientist, Black Ochre Data Labs at Telethon Kids and The Australian National University; Amanda Cole, composer; Sound engineer: Bob Scott; Latin consultant: Diana Fraser; cinematographer: Jules Wurm, Mira Soulio; sound recordist: Will Sheridan; editor: Bianca Willoughby; sound design: James Brown; colorist: Yanni Kronenberg.

Supported by: The Australian Council for the Arts, the Australian Government's arts funding and advisory body; produced in cooperation with: ANAT (Australian Network for Art and Technology), SAHMRI (South Australian Health and Medical Research Institute), and Curiosity Brisbane for the World Science Festival.

LIINU GRÖNLUND & OKKI NUUTILAINEN

OBSERVE THESE WORDS, 2020

3

Video, color, sound, 7 min. 24 sec.

The video by Liinu Grönlund and Okku Nuutilainen contrasts two seemingly incompatible ideas of nature. The images show the hands of laboratory technicians handling exotic frogs. Recording observations, taking measurements, and collecting data in an environment far away from the native habitats of the small animals, it is a scene that evokes a sense of the scientific control of mere objects. By contrast, the audio track carries a voice that instructs and soothing synthesizer music, inviting contemplation and conjuring up the clichéed image of nature as a tranquil and carefree realm. Nature is seen as a utopian refuge from the world.

However, those who »observe« these words closely see the images differently and experience the frogs as fellow creatures needing care. They represent the dangers to which humans are also exposed.

OBSERVE THESE WORDS was filmed in the research laboratory at Paignton Zoo in England, a setting where wild animals live in small, artificial habitats. The amphibians, in particular, are under threat of extinction, and the video serves as a poignant reminder of the precarious future they face. It underlines the urgent need for research and action to ensure their survival. The video conveys the conditions for an »observant« engagement with the animals' delicacy, beauty, and unique vitality.

The artistic montage of two concepts of nature—that of science, and that of spirituality—creates a third: the mental image of a complex connection between life forms.

Written, directed, edited, produced, and scripted by Okku Nuutilainen and Liinu Grönlund; camera: Anna Antsalo; music: Mikko Levoska; narrator: Okku Nuutilainen.

Supported by Kone Foundation – Koneen Säätiö.

THOMAS FEUERSTEIN **METABOLICA (CHAPTER 5), 2023**



7-part media installation

Thomas Feuerstein's biological and technical equipment-based artworks perform cycles as they take place in nature. Algae, fatty acids, and bacteria, responsible for photosynthesis and carbon processes, are coactors in the artistic production.

METABOLICA is a spatial narrative in six chapters about future-oriented synthetic material – plastics. The work formulates a concept of art that transcends the current petrochemical age. The installation envisions a biochemical age which will include new developments in ecology, the economy, and society.

The central focus is the biopolymer PHB (polyhydroxybutyrate), which is intended to replace petrochemical plastics. Scientists are working on producing fully biodegradable PHB from energy-rich carbon. They obtain this element of life from the wastewater of industrial and sewage treatment plants. Inspired by this, the artist conceived this bioengineering project in 2017, which since 2020 is being supported by a team of scientists and engineers.

In the first four chapters of *METABOLICA*, algae are cultivated and enriched with fatty acids in a bioreactor. *Cupriavidus necator* bacteria produce the material PHB by metabolizing the algae. In refinery equipment, the polymer is harvested, purified, dried, and stored as a powder in cans for processing into sculptures in a 3D printer.

THE NEXT RENAISSANCE recounts the fifth chapter. At this point in the narrative, the two sculptures *AHEAD* and *FROM HAND TO MOUTH* are on show in the exhibition room. The PHB replicas of the head and hand of Michelangelo's *David* evoke the canon of Renaissance sculpture. PHB is the marble of the 21st century. Bacteria break down the hand in the aqueous environment of a bio reactor. Michelangelo's art represents the eternal value of form, and Feuerstein's bioart conveys the spirit of the cycle, which must become mandatory for the 21st century in the interaction of technology, ecology, and society.

Artworks:

METABOLICA, TAKE AWAY, 2023

Wall graphic, print on polyester fabric

FROM HAND TO MOUTH, 2023

Steel, glass, plastic (PHB), pump, crane

METABOLICA, PARIS EDITION, 2024

Wall graphic, print on polyester fabric

LABORANT, 2012

Steel, thermoset, glass top

AHEAD, 2023

Biopolymer 3D printing (PHB)

PHB CANS, 2022

PHB, tin can, each 30 x 20 x 20 cm

MOL, 2022

Mirror glass, wooden panel

Microbiological research and biotechnological development: Christian Ebner, Livia Hökl, Judith Ascher-Jenull, Rudolf Markt, Thomas Pümpel, Christian Scherfler, and

Christoph Schinagl, Thomas Seppi, and Pamela Vrabl; Materials engineering: Valentine Troi; Software: Peter Chiocchetti; mechatronics and 3D printing: Jonathan Hanny, and Jan Contala; Design and mechanical engineering: Leopold Fahringer, Stefan Göschl, Tobias Hartung von Hartungen, and Mathias Hirnsperger; project coordination: Eva M. Kobler.

Special thanks to: Institute of Microbiology at the University of Innsbruck; the Department of Environmental Engineering at the University of Innsbruck; Biotreat GmbH and CERA.LAB, Innsbruck.

THIJS BIERSTEKER **VOICE OF NATURE, 2024**



Digital frame, recycled plastic, measuring sensors for volatile organic compounds (VOC), CO₂, temperature, humidity

The ecological function of trees has been known for a long time: they are capable of maintaining symbiotic network relationships with other plants; their photosynthetic capacity is enormous; they provide a habitat for animals; and in hot weather they have a cooling effect on all warm-blooded animals. Humans benefit from all of this, too.

VOICE OF NATURE is a site-specific artwork of data visualization, which is devoted to the life processes of trees in times of climate change. The protagonist in this case is the horse chestnut tree in the courtyard of the Goethe-Institut Paris, which has been growing there for almost 140 years. Sensors on the tree and in the surrounding area collect data on tree circumference, temperature conditions, carbon dioxide content of the air, humidity, and light levels. The changes are visualized in real time. This data illustrates the interactive vitality of the tree. Based on the annual tree rings, which show the long-term changes in metabolism, the media artwork generates digital tree rings every second.

Artist Thijs Biersteker also sees the work as a kind of »stethoscope« that expresses an attitude of concern and caregiving towards the tree. In a medical context, the doctor uses this device to listen to internal sounds of the human body in order to check the heart and lungs. In the poetic language of everyday urban life, parkland in a town or city is referred to as a »green lung«—a lung that keeps us healthy.

Science collaboration: Prof. Stefano Mancuso, International Lab. of Plant Neurobiology, University of Florence; sustainable production: Woven Studio; studio director: Sophie de Krom; technical design: Boompje Studio, Denisa Půbalová; technical management: Tomáš Potůček; special thanks to Anett Holzheid, Nathan Pottier, An de Hoop, and Bastiaan Kennedy.

Supported by EIT (European Institute of Innovation & Technology) Culture & Creativity.

RAFAEL LOZANO HEMMER

HORMONIUM, 2022

6

Custom-generative code, computer

HORMONIUM is a generative, computer-based artwork that produces sequences of ocean waves breaking. The spray forms text particles, which are released into the air. The text particles are acronyms of the names of hormones.

The *HORMONIUM* database contains the names of 28 hormones, including the growth hormone GH. The chronobiological release of hormones that occurs in the human body is illustrated on the video-graphic display: circadian rhythms—one cycle every 24 hours—synchronize the physiological processes. For example, cortisol, progesterone, and testosterone are released in the morning, FSH and LH in the afternoon, and oestradiol and prolactin at night. However, the work *HORMONIUM* also exhibits ultradian rhythms: cycles that are shorter than a day but longer than an hour.

Like a human being, the artwork ages over a 90-year cycle and therefore chronicles the decrease in aldosterone, calcitonin, GH, and renin as well as an increase in cortisol levels over time. This long-term work is shown in the exhibition in a short form as a video. In the computer version, the artwork dies at the end of the 90-year period. *HORMONIUM* was developed in collaboration with an endocrinologist.

Programming: Hugo Daoust; production assistance: Fanny Asselin, Karine Charbonneau, Olivier Groulx, Guillaume Tremblay, and Tracy Valcourt.

JEAN PAINLEVÉ

DIATOMÉES, 1968–1973

7

16 mm film, transferred to video, b/w and color, sound, 17 min.

The film about diatoms by Jean Painlevé and Geneviève Hamon is an incisive example of the interplay between science, art, and knowledge transfer. It offers a glimpse into the life of single-celled organisms, presented in intriguing images from the perspective of the then-new ultramicroscope. The visualized microorganisms are discussed in a dialogue between Painlevé the teacher and a student eager for knowledge. The result for today's viewer is not only a report from the past on the anatomy, physiology, behavior, and ecology of this algae species, the film also showcases the algae's utilization potential. Its silicate shell, for instance, is ideally suited for producing color pigments, glass polish, toothpaste, and dynamite.

The student tries to comprehend the unknown world of microorganisms by comparing it to the human world. Conversely, the teacher's perspective emphasizes how strange and mysterious diatoms are, and formulates novel questions that seek answers.

This characteristic attitude of the scientist Painlevé led to the contact with Surrealist artists. Both share a strong interest and an intuition for all kinds of strange phenomena and unusual constellations. This is expressed in the opening credits which are accompanied by a musical quote from the *Pirate Jenny* song from Bertolt Brecht's *Threepenny Opera*. But above all it is particularly evident in the electro-acoustic sound composition by Pierre Angles and Roger Lersy. Born of the spirit of *musique concrète*, it takes the listener into the rich inner world of an unfamiliar cosmos.

Authors: Jean Painlevé and Geneviève Hamon; music: Pierre Angles and Roger Lersy; voice off: Carola Meierrose and Jean Painlevé; editing: Jean-Philippe Berger; ultra-microphotography: Catherine Thiriot (Centre Océanologique de Bretagne).

DISPLAY: BLUE VALUES

8

During the Renaissance, *Fra Angelico Blue*, the most vibrant of all shades of blue, became a prestigious color. In the history of painting, blue not only symbolized purity and transcendence, it also graced the cloak of the Mother of God in depictions of the Virgin Mary. Further, its use in commissioned works enabled the painter's most expensive color to shine as a reflection of worldly riches.

The natural ultramarine blue pigment has been extracted from the rare highgrade deposits of the semi-precious stone lapis lazuli in a complex purification process since the 6th century BCE. Chemically, the intense blue is due to the mineral lasurite which is a sodium aluminosilicate compound. The chemical compound was identified in 1806 and its composition resembles the constituents of by-products of soda production. In 1826, the French chemist Jean-Baptiste Guimet found a way to chemically reproduce the formula creating synthetic ultramarine blue. He sold his pigment as a cheap blue that was used both by artists for paintings and for brightening paper and fabrics in daily use. The art history of ultramarine blue is linked to the history of a patent whose development leads from *Le Bleu Guimet* to Yves Klein's *IKB* (International Klein Blue).

The current collaboration between biochemist Thomas Seppi from the University of Innsbruck and the artist Thomas Feuerstein builds on this. For an exhibition project by Feuerstein for the 2024 European Capital of Culture Year at Lake Traunsee in Austria, Seppi developed an energy and resource efficient production process for ultramarine pigment. The materials are diatom silicate from Lake Traunsee, recycled aluminum, industrial sulfur waste, and regionally available clay and soda from Karbach in Austria. While Seppi prepares the patent application, Feuerstein tests the artist's material with binders: Dots of Seppi's ultramarine blue are emerging from the petri dishes.

Display:

THOMAS FEUERSTEIN

LE PETIT YVES, 2024

Horseshoe crab, ultramarine pigments (Seppi Blue)

THOMAS SEPPI

TRAUNSEE ULTRAMARINPIGMENTE, 2024

»Brennaugen« (raw pigment)

Draft of the patent application

Pigment sample

Table of the protocol for the chemical color synthesis with examples

Lapislazuli

Le Bleu Guimet, promotional material

Jan Gossaert [Jan Mabuse], *St Lucas Drawing the Virgin Mary*, ca. 1513, art postcard, National Gallery Prague.

Albrecht Dürer, *Das Rosenkranzfest*, 1506, art postcard, National Gallery Prague.

Le Carré Bleu. Feuille Internationale d'Architecture, Paris, 4. 1964.

Plan de Paris et de sa Proche Banlieue, Hachette, Paris 1954.

Corse. Les Guides Bleus, Hachette, Paris 1973.

Hayley Edwards-Dujardin, *Blau. Vom alten Ägypten bis zu Yves Klein*. Aus dem Französischen von Martina Panzer, Midas Zürich, 2022.

Jean-Michel Maulpoix, *Eine Geschichte vom Blau*. Aus dem Französischen von Margaret Millischer. Leipziger Literaturverlag, 2009.

MICHÈLE BOULOGNE

9

VENUS DOES NOT EXIST, 2021

Research on technological imagery of alien landscapes. An inquiry within the digital archive from NASA's Magellan mission to Venus

Machine-knitted fabric, wool, cotton, expanded polystyrene foam (EPS), linen paper

The cultural and emotional impact of landscapes is a main focus of interest for textile artist Michèle Boulogne. Aesthetic properties of textile materials such as form, color, and feel can correspond to structural geological features such as landforms or surface reliefs. When viewed comparatively, inspiring potential arises from this. The *VENUS DOES NOT EXIST* project, however, focuses on the inaccessible landscape of the planet Venus, which is invisible from the Earth.

Thanks to spacecraft and highly specialized technology, Venus can now be presented visually. Using Synthetic Aperture Radar (SAR), Venus's dense sulphurous atmosphere was penetrated and the entire surface of the planet imaged. Parts of the surface are first scanned in high resolution using electromagnetic waves, and photograph-like images are then generated from this data.

Boulogne's textile work is based on the digital archive of NASA's Magellan mission to Venus. The discrepancy between planetary inaccessibility and representative manageability, between high-tech mastery of space and human-like immediacy, between inhospitable, imaginary, and artistic environments leads to today's questions: What are our expectations regarding the future on Earth; which spaces are worth exploring and developing? What are the underlying fundamental principles or rules of conduct of a mission to distant worlds? The title *VENUS DOES NOT EXIST* should not only be read as an anti-myth caveat, it implicitly asks what desires drive us.

In collaboration with: Tilburg TextielLab, supported by: Stimulerings Fonds.

THOMAS FEUERSTEIN
TRANSULTRA, 2024

10

Ultra Original: ultramarine pigments on paper, 108 x 188 cm
Repro-print on synthetic textile, 80 x 140.5 cm

JOEL ONG
**UNTITLED INTERSPECIES UMWELTEN
2021-ONGOING**

11

Video, color, sound, 14 min. 55 sec.

The title of this video work contains an allusion to Jakob Johann von Uexküll's book *Umwelt und Innenwelt der Tiere (Environment and Inner World of the Animals)* from 1909. The term »environment« here, refers to the fact that a living organism lives in an environment that influences it, but which is also influenced by it. Joel Ong takes this idea as an opportunity to work with *Euglena gracilis*, a single-celled algae that reacts sensitively to stimuli. Capable of a wide range of contortions and movements, the microorganism resembles a dancer.

Invisible to the naked eye, Ong videotapes *Euglena gracilis* through a microscope and makes it visible. The light not only makes the tiny creature glow, the stimuli act as an offer of communication. The artist's work-in-progress aims to create a communication environment across species. The symbolic linking of unicellular organisms and humans is achieved technologically through movement tracking. The data obtained is in turn used to generate text. Poetic phrases are

no longer exclusively of human origin: algal movement and algorithm, which draw on Tweets, form an intersystem team of authors.

EGÓR KRAFT

12

CONTENT AWARE STUDIES (CAS)

2021-ONGOING

3-part media installation

The artist Egór Kraft, in collaboration with data scientists from the Strelka Institute at the University of Southampton, has developed tools for speculative and historical investigations in order to carry out creative research on ancient sculptures and friezes. Artificial neural networks were trained with thousands of datasets of 3D scans of classical sculptures in international museum collections (including the British Museum and the National Roman Museum). The algorithm obtained in this way was used to complete fragmentary or damaged works of art. The missing parts were filled in with prints from a 3D printer.

The question arises as to whether these synthetic results, generated by an artificial intelligence, have any claim to archaeological knowledge or indeed correlate with the canon of forms of Hellenistic and Roman art.

Possible critical objections encourage Egór Kraft who uses the algorithmic tool to create new sculptures. However, to the extent that revenants of ancient art are created, the results also exhibit obvious errors that lead to bizarre results and display signatures of modernity.

The *CONTENT AWARE STUDIES* presuppose historical knowledge, competence in comparative viewing, and aesthetic experience. Anyone who recognizes their witticisms will inquire as to the relationship between the past and future in art.

Artworks:

CAS_V11 Deep Portrait, 2022

Small format custom built server, open chassis and frame, machine learning algorithms, custom dataset

CAS_15.3 Deep Frieze, 2021

Breccia marble, concrete, machine learning algorithms, unique synthetic dataset, metal pipes

CAS_12.1 Caryatid Portrait, 2019

Crema Marfil marble, polyamide, machine learning algorithms

DOUGLAS C. ENGELBART

MOUSE, 1964

13

Circuit board, metal wheels, wooden case, cable
Original: Stanford Research Institute, Menlo Park, USA
Replica: Heinz Nixdorf MuseumsForum Paderborn, 2019

ANDRÉ GUIGNARD

P4 - DÉPRAZ-MAUS, 1980

Red model, 3 click buttons, plastic, metal

Alongside the keyboard, the computer mouse has become a crucial human-machine-interface. It was invented in the early 1960s.

In 1964, computer scientist Douglas C. Engelbart developed the input device at the Stanford Research Institute. His mouse features two wheels to determine its X/Y coordinates and a single button for clicking. The invention was necessitated by a new display system, which required a tool that would facilitate the interaction between human and machine. Computer engineer Bill English constructed the first prototype based on Engelbart's plans.

In 1970, the invention was patented as *X/Y Position Indicator for a Display System*. Engelbart himself called the device *Computer-Aided Display Control* in 1965. The term *mouse* ultimately prevailed, evoking the device's shape and swiftness of use.

However, it would take several years for the now omnipresent tool to become commercially viable. The engineer and watchmaker André Guignard designed and implemented the first modern computer mouse together with computer scientist Jean-Daniel Nicoud in 1977. It uses

scanning technology based on optical encoders in combination with mechanical rollers. Beginning in 1982, Logitech would sell this design under the name *P4*.

The two designs enabled the paradigm shift towards intuitive, gestural interaction with computers and helped make the digital universal machine suitable for everyday use.

CLAUDE E. SHANNON

THESEUS, 1952

14

16-mm film transferred to video, b/w, sound, 8:27 min.

This film shows mathematician, electrical engineer and founder of information theory Claude Elwood Shannon demonstrating his technomouse at Bell Laboratories, the research division of the telephone company AT&T. During the demonstration, what seems like the artificial memory of the mouse is revealed as a complex relay mechanism beneath the labyrinth. A mechanical mouse equipped with an electromagnet and mounted on a motorized carriage roams these passages, searching for an exit like the mythical hero Theseus. Whenever its copper whiskers contact one of the metal walls, the corresponding relay is switched into the *off*-position, representing the presence of a wall at that location. Theseus subsequently rotates 90° and continues exploring in that direction. The system learns by means of trial and error. Once the process is complete, the technological Theseus can reach his goal quickly and without interruption thanks to the relays.

This simple mathematics of 0 (off) and 1 (on) would go on to not only significantly improve telephone network routing, leading to the elimination of human operators. It also found applications in warehousing and data logistics as well as self-guiding weapons technology.

But its most revolutionary achievements lie in the foundations for digital computers and its inspiration for artificial intelligence research.

WILLIAM GREY WALTER **ELMER – (ELECTRO-MECHANICAL ROBOT), 1951**

15

16-mm film, transferred to video, b/w, sound, 2:20 min.

This roughly two-minute newsreel from 1951 introduces robotics pioneer William Grey Walter. In typical newsreel aesthetics with quick-paced voice-over commentary and dramatic background music, a robotic tortoise is presented as an elaborate toy for adults and given the cute nickname Torby. The announcer claims that the artificial animal possesses an electronic brain which functions like the human mind. However, its behavior is repeatedly compared to that of animals.

This frivolous popularization of the invention fails to convey its trailblazing significance. In the late 1940s, William Grey Walter built the first electronic autonomous robots at Burden Neurological Institute in Bristol, UK. Walter called his artificial creature *Machina Speculatrix*, referring to its imitation of searching behavior. The »scouting machine« was based entirely on electronic circuits, which were connected to external light and contact sensors, giving rise to the acronym ELMER (*Electro-Mechanical Robot*).

With his invention, William Grey Walter was able to prove that the successful construction of a »goal-seeking machine« did not depend on a large number of cerebral functions, but the complexity of their interconnections. This insight was transferred to our understanding of the human brain. In this sense, robotics is anthropology.

HISTORIC OTOSCOPES

16

From the collection of Deutsches Medizinhistorisches
Museum Ingolstadt (DMM, German Medical-Historic Museum)

Objects:

**Stirnspiegel nach Samuel Lewis
Ziegler (1861–1962), n. d.**

Brass, mirror glass, fiber band

**Ohrspekulum nach Arthur Hartmann
(1849–1931), 1901–1933**

Metal

S. Max & Son & Sons Ltd, London

Otoskop nach Brunton, 1901–1950

Metal, wood

Sass-Wolf u. Co, Berlin

Otoskop mit Kabelgriff, 1901–1950

Metal, glass, textile, plastic,

**Otoskop für Batteriebetrieb mit zwei
weiteren Wechselohrspiegeln, n. d.**

Metal, plastic

JOEL SHERWOOD-SPRING

HEARING, LOSS, 2018

17

Video, color, sound, 10:20 min.

The video *HEARING LOSS* by Joel Sherwood-Spring provides an insight in two senses of the word: by means of an otoscope, the video shows one eardrum of the artist and one of his mother. At the same time, the soundtrack is a conversation between the two, in which his mother talks about her experiences as a nurse in the racist Australian health-care system of the 1980s and 1990s. She had observed that an above-average number of indigenous children suffered from otitis media, an inflammatory infection of the middle ear. Hearing loss, learning difficulties, and meningitis are possible consequences and, in extreme cases, even tumors that lead to death.

While the otoscopic images in the video float like moving globes in an undefined darkness and exhibit indications of solidity, fluid and red fluxes, the soundtrack undergoes disturbing manipulations: the volume fluctuates considerably, frequencies are slurred, and interruptions to the point of incomprehensibility impede understanding of what is heard. Sherwood-Spring's intention is to reproduce the effects of middle ear inflammation on hearing.

The ear is more than just an organ; in the case of otitis media it becomes the medium of a major cultural conflict with a long history. The video tells of the invisibility of the disease, the marginalization of the Aboriginal Australians, and Juanita Sherwood's activism.

MANFRED P. KAGE

18

NEURONEN AUF CHIP REM 100-FACHE VERGRÖßERUNG, 2005

Scanning electron photomicrograph

Manfred P. Kage was a border crosser in the fields of art and science. He began his career as a chemical engineer, worked in the optical industry, studied art and philosophy, and later became an internationally renowned science photographer.

Kage's interest in organic and inorganic substances that cannot be perceived by the naked eye brought him to scientific microphotography, which led him to discover the astounding aesthetic appeal of more than 1,600 microscopically observable structures. Together with physicist and author Herbert W. Franke, he coined the term *Science Art* in 1966.

Kage radicalizes the *New Vision*, which László Moholy-Nagy postulated in the 1920s: »The photographic apparatus has offered us amazing possibilities, which we are only just beginning to evaluate. The visual image has been expanded and even the modern lens is no longer tied to the narrow limits of our eye.« The apparatus, Moholy-Nagy argues, »provides an impartial approach, such as our eyes, tied as they are to the laws of association, do not give.« (1928)

Kage's cooperation with the physiologist Dieter G. Weiß and his research into biosystems technology at the University of Rostock resulted in scanning electron microscope images of laboratory samples, such as the 100-fold magnification of neurons on a computer chip, which served to test, for instance, the reactions of nerve cells to pharmaceuticals.

DORCAS MÜLLER

STAMMBAUM DES NEUROCHIPS

19

Semiconductor chips and neuronal systems

Semiconductor chips and neuronal systems: Dorcas Müller's *STAMMBAUM DES NEUROCHIPS* (Genealogy of the Neurochip) documents the scientific history of two different fields of knowledge, raising an implicit epistemic question. Its first tier dates back to 1990, looking towards the future. For 30 years now, German researchers have been investigating how direct electrical connections can interface between semiconductor chips and neuronal systems. The long-term goal of this research is the development of neuroprosthetics.

Equipping human beings with tools and technologies shifts the relation between the natural and cultural existence of humanity with every major innovation. To visualize this idea, the artist makes reference to Ernst Haeckel's *Stammbaum des Menschen* (Genealogy of Man). In his *Anthropogeny* (1874), the proponent of Darwinian evolution outlines a complex evolutionary history of humankind.

Since the year 2000, a collection of the first single- and multi-cellular neurochips has formed, which represents the various stages of evolutionary hybridization between humans and technology. 36 of these neurochips form the *Stammbaum des Neurochips*. The logic of this genealogy raises the question: Do these chips represent medico-technological possibilities of restitution for injured people, or do they hold evolutionary potential for »Homo protheticus«, reaching for a new stage of human evolution?

In cooperation with: Armin Lambacher, Max Planck Institute of Biochemistry Martinsried/Munich, and Günther Zeck, Vienna University of Technology; special thanks to: Peter Fromherz.

ZBYNĚK BALADRÁN

DIDEROT'S DREAM, 2014

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Video, color, sound, 13:28 min.

Zbyněk Baladrán's essay film is the final work marking the end of *THE NEXT RENAISSANCE* exhibition parcours. With *DIDEROT'S DREAM*, Baladrán deepens questions regarding understanding the world, a subject he initially raised in his work *MODEL OF THE UNIVERSE*.

Drawing inspiration from the Plato's and the Enlightenment dialogues of the 18th century, a written conversation between two unidentified partners takes place. The interlocutors speculate about modes of cognition beyond proven knowledge, and end up pondering whether all consciousness might be one huge dream. Is human dreaming, therefore, more than a denial of reality or possibly an image-producing mental process that paves the way to knowledge?

The video addresses the viewers as possible third parties who could enrich the conversation with their deliberations and objections. All the thinking and speaking takes place against the backdrop of a dark night cosmic horizon.

The eternal silence of infinite space, which terrified the 17th-century scholar Blaise Pascal, is filled with a rushing noise in Baladrán's pictorial space. The cosmic background radiation from the universe's early days – the Big Bang – segues into the sounds of burning photographs. Motifs from the mass migration wave of 2014 appear on ephemeral image carriers.

The artist has added central anthropological terms to them by hand – »head,« »legs,« »hands,« »speech,« »eye.« Do we register the prints' disintegration in the blazing light as a melancholy memento mori?

BIOGRAPHIES

ZBYNĚK BALADRÁN (CZ) is a visual artist, curator and exhibition designer. He studied Art History at the Faculty of Arts, Charles University and New Media at the Academy of Fine Arts in Prague. He exhibits his work in the three disciplines throughout Europe. Zbyněk Baladrán lives in Prague.

THIJS BIERSTEKER (NL) is a data artist who creates media installations in collaboration with scientists from various disciplines. His work focuses on topics such as climate change, air pollution, the loss of biodiversity. He is the founder of Woven Studio (Amsterdam), he teaches at the Delft University of Technology and is a fellow at the Vrije Universiteit Amsterdam, where he also lives.

MICHÈLE BOULOGNE (NL) is an artist and textile designer and works at the crossroads of visual arts and textile experiments. Her sphere of activity ranges between artisanal and industrial textile production, archive research and the investigation of ecological problems. She describes herself as a space nerd. Michèle Boulogne lives in Rotterdam.

THOMAS FEUERSTEIN (AT) studied art history and philosophy, gaining his doctorate from Innsbruck University. As a theorizing media artist, he employs a method of »conceptual narration« to combine art, architecture, philosophy, and literature with economics, politics, and technology. He creates artworks based on neural networks, biotechnologies. Thomas Feuerstein lives in Vienna.

LIINU GRÖNLUND & OKKU NUUTILAINEN (FI) work together in the medium of film. Their work includes both documentary and artistic-poetic formats. Animals are a frequent theme of their work. *OBSERVE THESE WORDS* is their first joint work. They are currently directing a feature-length documentary. Grönlund and Nuutilainen live in Helsinki.

MANFRED P. KAGE (DE, 1935–2019) was a chemical engineer and was involved in technical developments for the chemical and optical industries. Kage is considered a representative of artistic and scientific microphotography and a pioneer of video and multimedia art. Together with Herbert W. Frank, he coined the term *Science Art*.

EGÓR KRAFT (AT, JP) describes himself as an investigative, interdisciplinary artist and researcher. He explores the boundaries of the human and the subject character of technologies in a wide range of topics. His tools include information systems, AI, computer technologies, film, text and materials for sculpture productions. Egór Kraft lives in Vienna and Tokyo.

RAFAEL LOZANO-HEMMER (CA) is a media artist who works at the interface of architecture and performance art. He focuses on installation art that requires participation and encourages the shaping of the public sphere. His diverse tools include robotics, real-time computer graphics, film projections, video and ultrasonic sensors. Lozano-Hemmer lives in Montreal and Madrid.

DORCAS MÜLLER (DE) is a media artist, and holds a doctorate in the field of media theory. As a founding member of the Laboratory for Antiquated Video Systems, she has been working for the ZKM | Center for Art and Media Karlsruhe since 2004. She has been head of the lab since 2011. Dorcas Müller lives in Karlsruhe.

JOEL ONG (CA) is a media artist who works primarily with environmental sensor technology. His eco-art is dedicated to the relationship between environmental conditions, human-to-human and human-to-microbe relationships. Ong holds a PhD, is Assistant Professor of Computational Arts and Director of *Sensorium: The Centre for Digital Arts and Technology* at York University, Canada. Ong lives in Toronto.

JEAN PAINLEVÉ (FR, 1902–1989) was a documentary filmmaker, photographer and set designer based in Paris. His scientific training in medicine and biology led him to the genre of nature film, for which he became famous. His distinctive aesthetic visual language made him a border crosser between science and the film of the early avant-garde.

HELEN PYNOR (AU) is an artist and researcher exploring the boundary between life and death, the intersubjective nature of organ transplantation and the relationship between organicity and prosthetics. She is trained as a cell and molecular biologist and holds a Ph.D. in art. Collaborations with scientists are part of her strategic understanding of art. Helen Pynor lives in Sydney and London.

JOEL SHERWOOD-SPRING (AU) is an anti-disciplinary artist of the Wiradjuri, one of Australia's Aboriginal tribes. He studied architecture, which has resulted in projects on space and power. In his work, he primarily addresses the narratives of indigenous history, which is characterized by ongoing colonization. Joel Sherwood-Spring lives in Sydney.

CREDITS

Zbyněk Baladrán, *MODEL OF THE UNIVERSE*, 2009

DIDEROT'S DREAM, 2014

Courtesy of the artist

Thijs Biersteker, *VOICE OF NATURE*, 2024

Courtesy of the artist and Woven Foundation for Creative Climate Communication

Michèle Boulogne, *VENUS DOES NOT EXIST*, 2021

Courtesy of the artist

Douglas C. Engelbart, *MOUSE*, 1964

Courtesy of HNF Heinz Nixdorf MuseumsForum, Paderborn

Thomas Feuerstein,

METABOLICA (CHAPTER 5), 2023

LE PETIT YVES, 2024

TRANSULTRA, 2024

Courtesy of the artist and Galerie Thoman, Innsbruck/Vienna

André Guignard, *P4 - DÉPRAZ-MAUS*, 1980

Courtesy of the Computermuseum, Universität Stuttgart

- //computermuseum-stuttgart.de

Rafael Lozano Hemmer, *HORMONIUM*, 2022

Courtesy of the artist

Manfred P. Kage, *NEURONEN AUF CHIP REM*, 2005

Courtesy of Sammlung Kage GbR, Lauterstein

Egór Kraft, *CAS*, 2018 - ongoing

Courtesy of the artist

René Magritte, *LE GÔUT DE L'INVISIBLE*, 1927

Courtesy of Staatliche Kunsthalle Karlsruhe, © VG Bild-Kunst Bonn, 2024

Dorcas Müller, *STAMMBAUM DES NEUROCHIPS*, 2023

Courtesy of the artist

Joel Ong, *UNTITLED INTERSPECIES UMWELTEN*, 2024

Courtesy of the artist

HISTORISCHE OTOSKOPE, n. d.

Courtesy of Deutsches Medizinhistorisches Museum Ingolstadt

Jean Painlevé, *DIATOMÉES*, 1968-1973

Courtesy of Les Documents Cinématographiques / Archives Jean Painlevé, Paris

Helen Pynor, *93% HUMAN*, 2023

Courtesy of the artist

Tobias Reichel, FIGUREAUTOMAT – SPINNE, ca. 1604
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Martin Schaffner, TISCHPLATTE FÜR ASYMUS STEDELIN, 1533
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Thomas Seppi, TRAUNSEE ULTRAMARINPIGMENTE, 2024
Courtesy of the scientist, Medical University, Innsbruck

Joel Sherwood-Spring, HEARING LOSS, 2018
Courtesy of the artist

Wacker Chemie Burghausen, REINSILIZIUM, n. d.
Courtesy of ZKM | Center for Art and Media Karlsruhe

Claude E. Shannon, THESEUS. MOUSE WITH A MEMORY, 1952
Courtesy of AT&T Archives and History Center

Liinu Grönlund & Okku Nuutilainen, OBSERVE THESE WORDS, 2020
Courtesy of the artists and AV-arkki. The Centre for Finnish Media Art, Helsinki

William Grey Walter, ELMER, 1951
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Willem Isaacs Van Swanenburg, VERA ANATOMIAE, 1610
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X-RAY OF EDVARD MUNCH'S LEFT HAND, 1902
Courtesy of Munchmuseet, Oslo

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