Super Sight: A World Viewed Through Technology

Curated by Kerstin Hamilton and Alexandra A. Ellis

Photo: Jakob Joelson/Västerbottens museum

Berenice Abbott
Lennart Nilsson
Forensic Architecture

Albert Sten
Craig Ames
Kate Crawford & Vladan Joler
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Västerbottens museum 22 October 2023 – 7 April 2024

By exploring various historical moments – from 1950s documentary photographs of magnetic fields and sound waves to contemporary artificial intelligence –*Super Sight: A World Viewed Through Technology* examines how technological advancements offer new ways to perceive and comprehend reality.

The exhibition takes its starting point in the images of scientific phenomena in the late 1950s and early 1960s by documentary photographer Berenice Abbott. Motivated by a desire to portray and explain her contemporary world, Abbott staged photographic experiments. Her images presented in the exhibition provide insight into the innovative scientific environments and materials of that time.

Two decades on, the Swedish photographer Lennart Nilsson embarked on his photographic journey into the human body. His images were groundbreaking and gained significant international recognition. Nilsson's visionary ambitions provided people with the opportunity to, for the first time, study something that had not been possible to see before, such as the development of a foetus before birth. →

⟶ The interdisciplinary research collective Forensic Architecture represents the contemporary era in the exhibition. Through innovative techniques and methods, they uncover human rights abuses, highlighting the importance of rigorous fact-gathering as a defence against the spread of misinformation in an age of "alternative facts.”

The work by Abbott, Nilsson, and Forensic Architecture reveals reality – the true state of things as they are – and highlights the role of technology and systematic methods in uncovering and making visible what is otherwise unseen.

In the exhibition’s Project Space, a variety of contemporary methods and new artistic works presented. The artists avail of visual techniques to depict both what exists and what has been digitally constructed with the help of artificial intelligence. These perspectives invite a critical view on some of our time’s innovative techniques and images that are generated today, highlighting both the opportunities and challenges posed by technological advancements, along with the questions they raise.

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I utställningens "projektrum" skapas utrymme för reflektion och eftertanke i relation till ny teknik. Här introduceras samtida perspektiv med fokus på hur information och desinformation genereras. Besökaren får ta del av exempel på den digitala visuella teknikens kapacitet att skildra det som faktiskt existerar men också digitalt konstruerade bilder som saknar en fysisk koppling till det som porträtteras.

Med artificiell intelligens (AI) följer stora möjligheter men också betydande risker. Den tro och förhoppning som kanske har knutits till att en epokgörande teknik som AI skulle vara neutral har under de senaste åren visat sig felaktig. I själva verket fortsätter AI att upprätthålla de ojämlika system som redan påverkar marginaliserade personer. Strukturell diskriminering tillåts reproduceras med teknikens hjälp. Samtidigt gör tekniken det möjligt att visualisera och begreppsliggöra vår tids viktiga utmaningar och hot, såsom klimatförändringar och brott mot mänskliga rättigheter.

För snart 200 år sedan introducerades de första kamerorna. Idag befinner vi oss i en teknologisk utvecklingsprocess som i likhet med den tidiga fotografins banbrytande kraft ger oss människor möjligheten att se och förstå världen på nya sätt. Teknikens expansion manar till eftertanke: Vad är det för bilder som skapas och hur formuleras och förmedlas kunskap under olika tidsperioder? Vilka skildringar bygger på fakta och vilka är uppdiktade?

In the exhibition's "project room", space for reflection and contemplation is created in relation to new technology. Here, contemporary perspectives are introduced with a focus on how information and disinformation are generated. The visitor gets to take part of examples of the digital visual technology's capacity to portray what actually exists, but also digitally created images that lack a physical connection to what is portrayed.

With artificial intelligence (AI) comes great opportunities but also considerable risks. The belief and hope that may have been connected to an epoch-making technology such as AI would be neutral have proven to be incorrect in recent years. In fact AI continues to maintain the unequal systems that are already affecting marginalized people. Structural discrimination is allowed to be reproduced with the help of technology. At the same time, technology makes it possible to visualize and conceptualize the important challenges and threats of our time, such as climate change and crime against human rights.

Almost 200 years ago the first cameras were introduced. Today, we find ourselves in a technological development process that, similar to the groundbreaking force of early photography, provides us humans with the opportunity to see and understand the world in new ways. The expansion of technology encourages reflection: What kind of images are made, and how is knowledge formulated and conveyed during different times? Which depictions are based on fact and which are made up?

Photo: Jakob Joelson/Västerbottens museum

BERENICE ABBOTT

Berenice Abbott (1898–1991) started her photographic career in the early 1920s. For many years, she devoted herself to a sociological photographic study in her home country, the USA, where she directed her camera towards New York that was rapidly changing. As a documentary photographer with a preference for "straight photography" – a form of photography that encompasses sharp, realistic, detailed images – Abbott gained attention and appreciation. She used the camera to record without allowing individual expression to dominate, with the ambition to make images that remained as true to the subject as possible.

Abbott's interest in societal and technological development led her to Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts, in the late 1950s where she developed techniques to visualise science. The exhibition presents a selection of Abbott's images of scientific phenomena made during her years at the MIT.

In the year World War II ended – just over a decade before Abbott arrived at MIT – engineer and science administrator Vannevar Bush published the report "Science, The Endless Frontier" (1945). Bush argued that increased support for scientific research in the USA was crucial for economic growth, national security, and overall societal progress. This period saw a growing faith in science, and Abbott's enthusiastic engagement with science and belief in photography’s role in public communication should be viewed in this context.

Abbott articulated her photographic philosophy in written works such as "A Guide to Better Photography" (1941) and the manifesto "Photography and Science" (1939), the latter of which is featured in the exhibition.


Berenice Abbott
Berenice Abbott (1898–1991) påbörjade sin fotografiska bana i början av 1920-talet. Under många år ägnade hon sig åt en närmast sociologisk fotografistudie i hemlandet USA, där hon riktade sin kamera mot ett New York i förändring. Det är som dokumentärfotograf med en förkärlek för "straight photography" – en form av fotografi som omfattar skarpa, realistiska, detaljrika bilder – som Abbott fått mest uppmärksamhet och uppskattning. Hon ville med kamerans hjälp registrera det som utspelade sig utan att låta det individuella uttrycket ta för stor plats: Bilden skulle vara så trogen förlagan som möjligt.
I utställningen vänder vi blicken mot Abbotts bilder av vetenskapliga fenomen som hon gjorde i slutet av 1950-talet under sina år vid Massachusetts Institute of Technology (MIT) i Cambridge, Massachusetts. Det var Abbotts intresse för teknologisk och samhällelig utveckling som ledde henne till MIT där hon kom att utveckla tekniker för att visualisera vetenskap.
Samma år som andra världskrigets tog slut – och drygt ett decennium innan Abbott kom till MIT skrev ingenjören och vetenskapsadministratören Vannevar Bush rapporten "Science, The Endless Frontier" (1945). Bush understryker i sin rapport att ett ökat stöd till vetenskaplig forskning i USA är viktigt för landets ekonomiska tillväxt, nationella säkerhet och samhällets förbättring som helhet. En stark tilltro till vetenskap framträder och det är i ljuset av den här tidsandan som vi kan betrakta Abbotts entusiastiska förhållningssätt till vetenskapen, och till fotografiets roll i att kommunicera den till folket.
Abbott uttryckte sig också i text för att förmedla sin vision om fotografi, bland annat i "A Guide to Better Photography" (1941) och manifestet "Photography and Science" (1939), som finns reproducerat i utställningen.
Berenice Abbott (1898–1991) began her photographic journey in the 1920's. For many years she pursued an almost sociological photographic study in her native country, USA, where she directed her camera towards a changing New York. It is as a documentary photographer with an inclination towards "straight photography" – a form of photography that embraces sharp, realistic, detailed images – that Abbott has received the most attention and appreciation. Her desire was to use the camera to record what took place without allowing individual expression to dominate: The image should be as faithful to the original as possible.
In the exhibition we gaze towards Abbott's images of scientific phenomena made towards the end of the 1950's during her years at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts. It was Abbott's interest in technology and societal development that led her to MIT where she came to develop techniques to visualize science.
The same year as the second world war came to an end – and around one decade before Abbott arrived at MIT – the engineer and scientific administrator Vannevar Bush wrote the report "Science, The Endless Frontier" (1945). In the report, Bush emphasises that increased support for scientific research in the USA is crucial for the country's economic growth, national security and overall societal improvement. A strong belief in science emerges and it is in the light of this zeitgeist that we can observe Abbott's enthusiastic approach to science, and to photography's role in communicating it to people.
Abbott also expressed herself through text to convey her vision of photography, for instance in "A Guide to Better Photography" (1941) and the manifest "Photography and Science" (1939), which is reproduced in the exhibition.
Photo: Jakob Joelson/Västerbottens museum

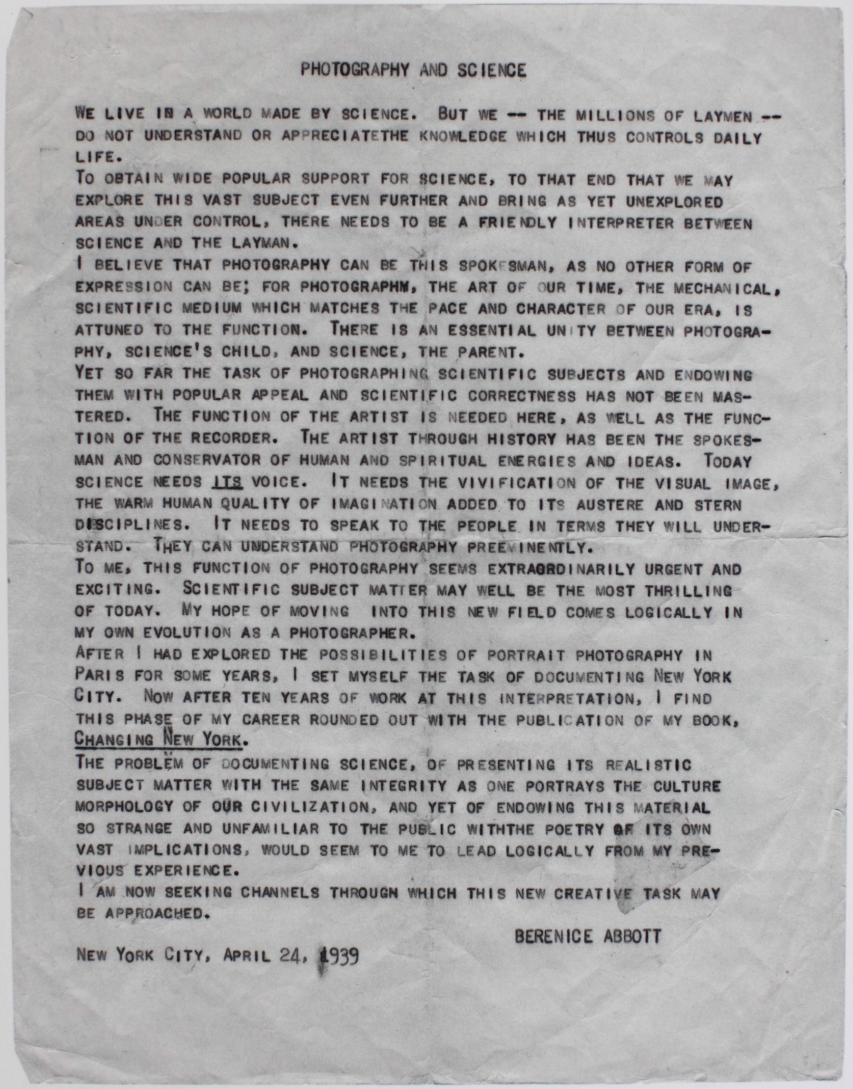
BERENICE ABBOTT — We Live In A World Made By Science

In 1939, Abbott wrote a text originally intended as a letter to a friend in the scientific community, which she later considered a manifesto. In the text, Abbott argued for photography as a means to communicate new scientific concepts to the general public. One such complex theory emerging in the early 20th century was quantum mechanics. Abbott asserted that photography was needed to assist the "layman" in interpreting science.

Following the principles set out in her manifesto, Abbott devoted herself to visualising science through photography from the late 1930s to the early 1960s. During the mid-1940s, she also served as the picture editor for *Science Illustrated* magazine.

While at MIT, Abbott conducted experiments with a camera and various instruments, developing new photographic techniques. In 1942, she began working on a camera designed for advanced macrophotography. Abbott's "Super Sight" involved magnifying the subject's reflection before exposure, using a light-sensitive negative paper measuring up to 16x20 inches to produce highly detailed images.

Although Super Sight failed to achieve widespread success, Abbott remained enthusiastic about her invention. It reflects her curiosity and commitment to exploring the world through photography. Super Sight emerged from Abbott's recognition of the need for an innovative technique, and as an artist, she led the development of new methods for portraying reality.



PHOTOGRAPHY AND SCIENCE

WE LIVE IN A WORLD MADE BY SCIENCE. BUT WE -- THE MILLIONS OF LAYMEN -- DO NOT UNDERSTAND OR APPRECIATETHE KNOWLEDGE WHICH THUS CONTROLS DAILY LIFE.

TO OBTAIN WIDE POPULAR SUPPORT FOR SCIENCE, TO THAT END THAT WE MAY EXPLORE THIS VAST SUBJECT EVEN FURTHER AND BRING AS YET UNEXPLORED AREAS UNDER CONTROL, THERE NEEDS TO BE A FRIENDLY INTERPRETER BETWEEN SCIENCE AND THE LAYMAN.

I BELIEVE THAT PHOTOGRAPHY CAN BE THIS SPOKESMAN, AS NO OTHER FORM OF EXPRESSION CAN BE; FOR PHOTOGRAPHM, THE ART OF OUR TIME, THE MECHANICAL, SCIENTIFIC MEDIUM WHICH MATCHES THE PACE AND CHARACTER OF OUR ERA, IS ATTUNED TO THE FUNCTION. THERE IS AN ESSENTIAL UNITY BETWEEN PHOTOGRAPHY, SCIENCE'S CHILD, AND SCIENCE, THE PARENT.

YET SO FAR THE TASK OF PHOTOGRAPHING SCIENTIFIC SUBJECTS AND ENDOWING THEM WITH POPULAR APPEAL AND SCIENTIFIC CORRECTNESS HAS NOT BEEN MASTERED. THE FUNCTION OF THE ARTIST IS NEEDED HERE, AS WELL AS THE FUNCTION OF THE RECORDER. THE ARTIST THROUGH HISTORY HAS BEEN THE SPOKESMAN AND CONSERVATOR OF HUMAN AND SPIRITUAL ENERGIES AND IDEAS. TODAY SCIENCE NEEDS ITS VOICE. IT NEEDS THE VIVIFICATION OF THE VISUAL IMAGE, THE WARM HUMAN QUALITY OF IMAGINATION ADDED TO ITS AUSTERE AND STERN DISCIPLINES. IT NEEDS TO SPEAK TO THE PEOPLE IN TERMS THEY WILL UNDERSTAND. THEY CAN UNDERSTAND PHOTOGRAPHY PREEMINENTLY.

TO ME, THIS FUNCTION OF PHOTOGRAPHY SEEMS EXTRAORDINARILY URGENT AND EXCITING. SCIENTIFIC SUBJECT MATTER MAY WELL BE THE MOST THRILLING OF TODAY. MY HOPE OF MOVING INTO THIS NEW FIELD COMES LOGICALLY IN MY OWN EVOLUTION AS A PHOTOGRAPHER.

AFTER I HAD EXPLORED THE POSSIBILITIES OF PORTRAIT PHOTOGRAPHY IN PARIS FOR SOME YEARS, I SET MYSELF THE TASK OF DOCUMENTING NEW YORK CITY. NOW AFTER TEN YEARS OF WORK AT THIS INTERPRETATION, I FIND THIS PHASE OF MY CAREER ROUNDED OUT WITH THE PUBLICATION OF MY BOOK, CHANGING NEW YORK.

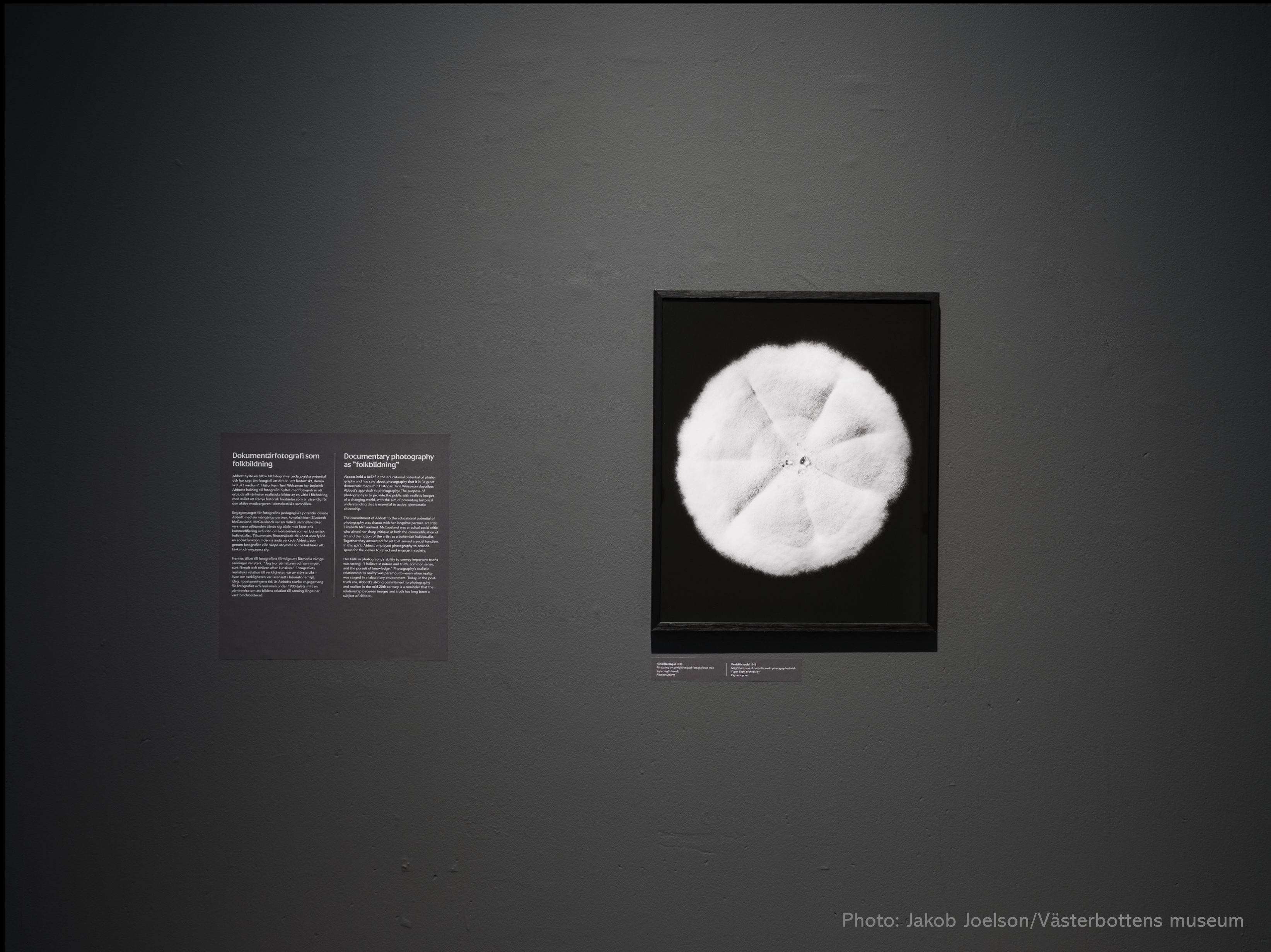
THE PROBLEM OF DOCUMENTING SCIENCE, OF PRESENTING ITS REALISTIC SUBJECT MATTER WITH THE SAME INTEGRITY AS ONE PORTRAYS THE CULTURE MORPHOLOGY OF OUR CIVILIZATION, AND YET OF ENDOWING THIS MATERIAL SO STRANGE AND UNFAMILIAR TO THE PUBLIC WITHTHE POETRY OF ITS OWN VAST IMPLICATIONS, WOULD SEEM TO ME TO LEAD LOGICALLY FROM MY PREVIOUS EXPERIENCE.

I AM NOW SEEKING CHANNELS THROUGH WHICH THIS NEW CREATIVE TASK MAY BE APPROACHED.

BERENICE ABBOTT

NEW YORK CITY, APRIL 24, 1939

Berenice Abbott's "manifesto" expressing her early interest in using photography to interpret scientific principles


Dokumentärfotografi som folkbildning
Abbott hyste en tilltro till fotografins pedagogiska potential och har sagt om fotografi att det är "ett fantastiskt, demokratiskt medium". Historikern Terri Weissman har beskrivit Abbotts hållning till fotografin: Syftet med fotografi är att erbjuda allmänheten realistiska bilder av en värld i förändring, med målet att främja historisk förståelse som är väsentlig för den aktiva medborgaren i demokratiska samhällen.
Engagemanget för fotografins pedagogiska potential delade Abbott med sin mångåriga partner, konstkritikern Elizabeth McCausland. McCauslands var en radikal samhällskritiker vars vassa utlåtanden vände sig både mot konstens kommodifiering och idén om konstnären som en bohemisk individualist. Tillsammans förespråkade de konst som fyllde en social funktion. I denna anda verkade Abbott, som genom fotografier ville skapa utrymme för betraktaren att tänka och engagera sig.
Hennes tilltro till fotografiets förmåga att förmedla viktiga sanningar var stark: "Jag tror på naturen och sanningen, sunt förnuft och strävan efter kunskap." Fotografiets realistiska relation till verkligheten var av största vikt – även om verkligheten var iscensatt i laboratoriemiljö. Idag, i postsanningens tid, är Abbotts starka engagemang för fotografiet och realismen under 1900-talets mitt en påminnelse om att bildens relation till sanning länge har varit omdebatterad.
Documentary photography as "folkbildning"
Abbott held a belief in the educational potential of photography and has said about photography that it is "a great democratic medium." Historian Terri Weissman describes Abbott's approach to photography: The purpose of photography is to provide the public with realistic images of a changing world, with the aim of promoting historical understanding that is essential to active, democratic citizenship.
The commitment of Abbott to the educational potential of photography was shared with her longtime partner, art critic Elizabeth McCausland. McCausland was a radical social critic who aimed her sharp critique at both the commodification of art and the notion of the artist as a bohemian individualist. Together they advocated for art that served a social function. In this spirit, Abbott employed photography to provide space for the viewer to reflect and engage in society.
Her faith in photography's ability to convey important truths was strong: "I believe in nature and truth, common sense, and the pursuit of knowledge." Photography's realistic relationship to reality was paramount—even when reality was staged in a laboratory environment. Today, in the post-truth era, Abbott's strong commitment to photography and realism in the mid-20th century is a reminder that the relationship between images and truth has long been a subject of debate.
Penicillinmögel 1948
Förstoring av penicillinmögel fotograferad med
Super sight-teknik
Pigmentutskrift
Penicillin mold 1948
Magnified view of penicillin mold photographed with
Super Sight technology
Pigment print
Photo: Jakob Joelson/Västerbottens museum

BERENICE ABBOTT — At the Massachusetts Institute of Technology

Abbott's position at the Massachusetts Institute of Technology offered her a stable income for the first time. This environment allowed her to engage in partnerships with researchers, particularly within MIT's Physical Science Study Committee, where experimentation was encouraged. In this capacity, she was assigned to produce images for a team of physicists, collaborating with assistants in the laboratory. The objective of these images was evident: to broaden humanity's comprehension of the world and inspire the younger generation to explore the natural sciences.

Through her employment at MIT, Abbott positioned herself outside the mainstream of documentary photography. While her images gained broad exposure through textbooks, they failed to reach the traditional art and photography audience. She became involved in educational settings, and with this, sacrificed visibility within artistic circles. Despite earlier being embraced, by the predominantly male photographic elite of the 1920s and 30s, she now found herself marginalised within the field. At the MIT, which was an equally male-dominated environment, Abbott also grappled with the challenges of being a woman. Consequently, she viewed photography as a political tool, aiming to dismantle barriers and foster inclusivity.

Abbott was fascinated by the opportunity to explore subjects in the natural sciences that had not yet been visually represented. In doing so, she move beyond traditional subjects in visual art, such as portraits and landscapes. She firmly believed that photography needed to broaden its scope by capturing new expressions, with images that depicted motion and time.

Abbott och realismen

Abbott har sagt att det mest "verkliga" hon kunde fotografera var vetenskap och just jakten på det verkliga var centralt i hennes konstnärskap. Fotografi erbjuder, menade hon, en realistisk, faktabaserad och objektiv bild av världen. Hennes sätt att förhålla sig till fotografi ska ses i ljuset av att hon formades som fotograf under en tid präglad av fotografiska inriktningar som piktorialism och surrealism. Dessa stilar lockade henne inte, och det "raka" fotografiet erbjöd en kontrast till det som hon uppfattade som ett sentimentalt bildspråk. Abbott har skrivit att "straight photography is a clean breath of good, fresh air."

Varför detta intresse i den bild som kan presentera fakta? Jo, därför att Abbott såg i fotografiet en unik potential att kommunicera viktig kunskap till den breda allmänheten. I *A Guide to Better Photography* beskriver hon att fotografiet har gått in i en ny fas, där fotografiets ställning som kommunikativt medium är på väg att stärkas. Det är tydligt att Abbott själv ville driva samtalet om fotografi i den riktningen.

Samtidigt är hennes bilder av vetenskap ofta abstrakta och frågan är vilken fakta det är som egentligen kommuniceras. Hur kan hennes bilder av kvantmekaniska fenomen – som interferensmönster – förmedla kunskap, och ses som väsentligen realistiska?

Idag, i postsanningens tid, är Abbotts förhållningssätt till fotografi och realism en påminnelse om att fotografiets objektivitet aldrig har varit en självklarhet. Hennes inställning är också en påminnelse om att fotografisk realism, möjligheten att lita på bilder, spelar en roll i det fria och öppna samhället.

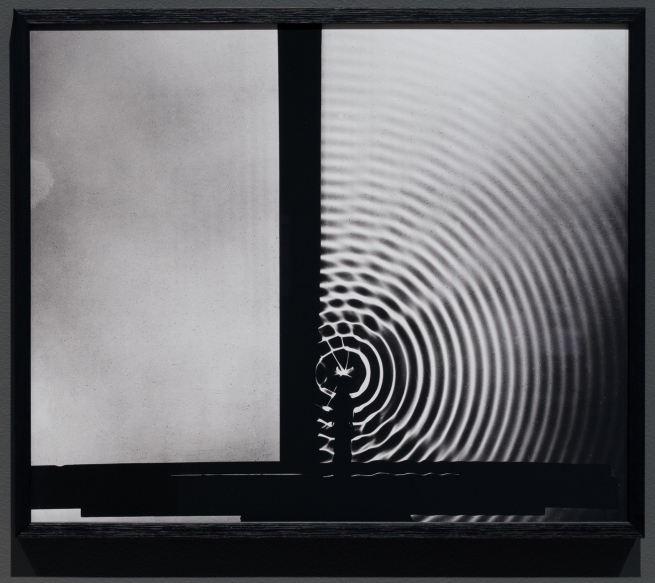
Abbott and realism

Abbott has stated that the most "real" thing she could photograph was science, and the pursuit of the real was central to her artistic vision. Photography, she argued, offers a realistic, fact-based, and objective view of the world. Abbott's approach to photography should be considered in the context of her era, given that she progressed her photographic practice during a period when photographic movements such as pictorialism and surrealism were in vogue. These styles did not appeal to her, and in "straight" photography she identified contrasting approaches to what in her mind was a sentimental visual language. She claimed, "Straight photography is a clean breath of good, fresh air."

Why this interest in images that are able to convey facts? Because Abbott saw in photography a unique potential to communicate important knowledges to the general public. In *A Guide to Better Photography*, she describes a new phase of photography, where its role as a communicative medium is set to be strengthened. Clearly, this is the direction that Abbott herself wanted to steer the conversation about photography.

However, her images of science are often abstract, and the question arises: What facts are actually being conveyed? How can her images of quantum mechanical phenomena, such as interference patterns, communicate knowledge and be considered essentially realistic?

Today, in the proclaimed post-truth era, Abbott's approach to photography and realism serves as a reminder that the objectivity of photography has never been a given. Her stance also reminds us that photographic realism and the option to trust images, matters in a free and open society.



Interferensmönster
Massachusetts, sent 1950-tal
Demonstration av en våginterferens i en vågtrittesapparat
Pigmentutskrift

Interference patterns
Massachusetts, late 1950s
Demonstration of wave interference in a ripple tank
Pigment print

Photo: Jakob Joelson/Västerbottens museum

BERENICE ABBOTT — Abbott’s Realism

Abbott has stated that science was the most ”real" thing she could photograph, and the concept of reality was central to her artistic practice. She believed that photography offered a truthful, evidence-based, and objective portrayal of the world. Her approach to photography should be understood in the context of her development as a photographer during a time dominated by movements like Pictorialism and Surrealism, styles that did not resonate with her. In contrast, "straight" photography appealed to her as it offered a clear alternative to what she saw as the sentimental visual language of those movements. Abbott described straight photography as "a clean breath of good, fresh air.”

This preference was rooted in her belief that photography had a unique ability to communicate vital knowledge to the public. In "A Guide to Better Photography," Abbott observed that photography had evolved into a medium increasingly recognised for its communicative power. It is clear that she was also committed to steering the conversation about photography's role in society in this direction.

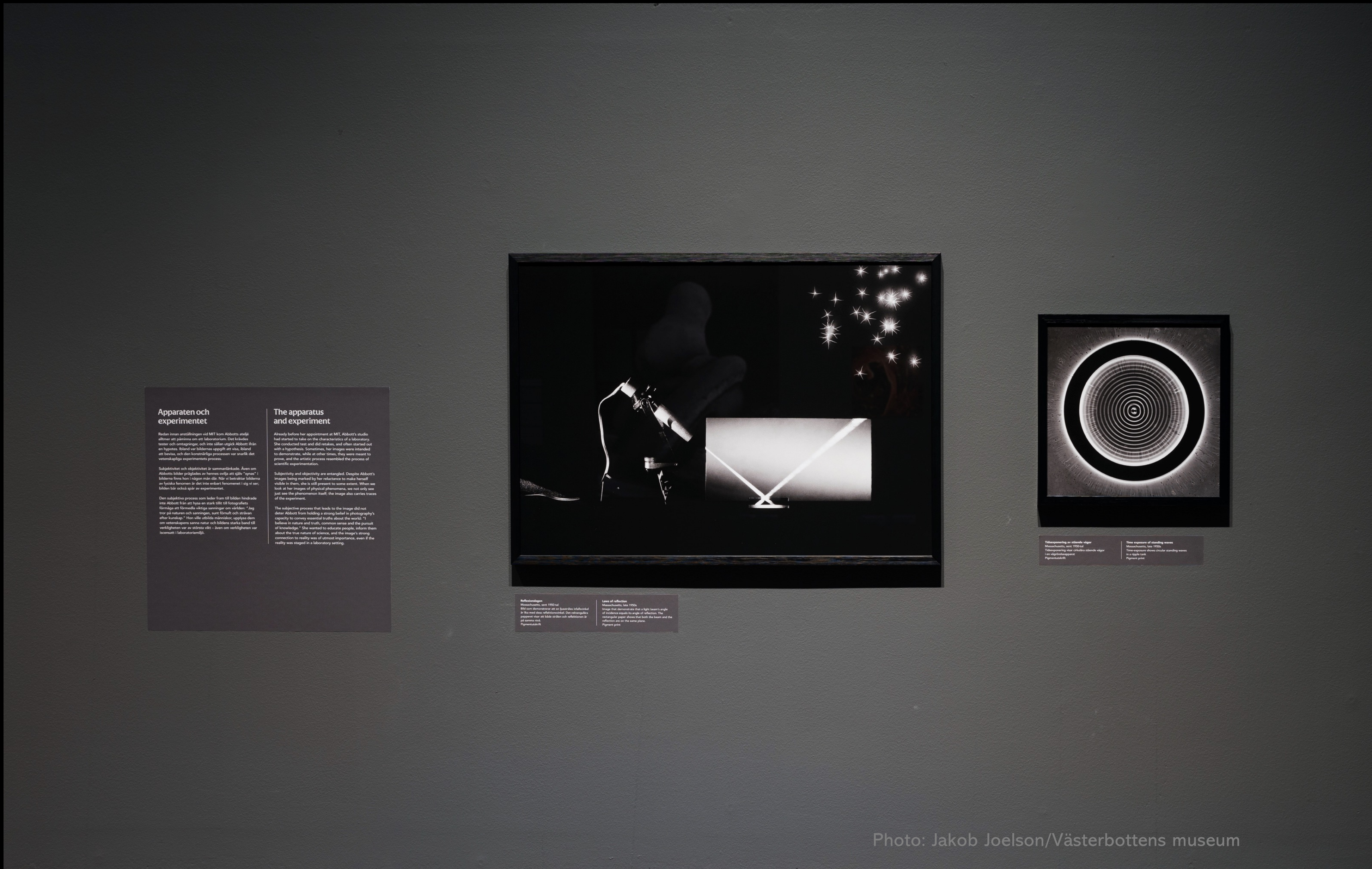
Photo: Jakob Joelson/Västerbottens museum

BERENICE ABBOTT — Abbott and the Experiment

Even before she began working at MIT, Abbott's studio increasingly took on the characteristics of a laboratory. Her work involved experimentation, with frequent tests and retries, often beginning with a hypothesis. The purpose of her images varied: some were intended to reveal, while others aimed to demonstrate, employing artistic methods reminiscent of scientific experimentation.

Although Abbott's images were characterised by her reluctance to personally appear in them, her presence is still evident. When we look at her images of physical phenomena, we see not only the phenomena but also the imprint of the artist's experimental process.

Abbott held a deep conviction in photography's ability to convey profound truths about the world. "I believe in nature and truth, common sense, and the pursuit of knowledge," she declared. Her goal was to educate people about the true nature of science, and preserving a strong connection between the image and reality was crucial to her – even when that reality was constructed in a laboratory setting. Like in scientific work, Abbott’s artistic process intertwines objectivity and subjectivity.


Apparaten och experimentet
Redan innan anställningen vid MIT kom Abbotts ateljé alltmer att påminna om ett laboratorium. Det krävdes tester och omtagningar, och inte sällan utgick Abbott ifrån en hypotes. Ibland var bildernas uppgift att visa, ibland att bevisa, och den konstnärliga processen var snarlik det vetenskapliga experimentets process.
Subjektivitet och objektivitet är sammanlänkade. Även om Abbotts bilder präglades av hennes ovilja att själv "synas" i bilderna finns hon i någon mån där. När vi betraktar bilderna av fysiska fenomen är det inte enbart fenomenet i sig vi ser; bilden bär också spår av experimentet.
Den subjektiva process som leder fram till bilden hindrade inte Abbott från att hysa en stark tillit till fotografiets förmåga att förmedla viktiga sanningar om världen: "Jag tror på naturen och sanningen, sunt förnuft och strävan efter kunskap." Hon ville utbilda människor, upplysa dem om vetenskapens sanna natur och bildens starka band till verkligheten var av största vikt – även om verkligheten var iscensatt i laboratoriemiljö.
The apparatus and experiment
Already before her appointment at MIT, Abbott's studio had started to take on the characteristics of a laboratory. She conducted test and did retakes, and often started out with a hypothesis. Sometimes, her images were intended to demonstrate, while at other times, they were meant to prove, and the artistic process resembled the process of scientific experimentation.
Subjectivity and objectivity are entangled. Despite Abbott's images being marked by her reluctance to make herself visible in them, she is still present to some extent. When we look at her images of physical phenomena, we not only see just see the phenomenon itself; the image also carries traces of the experiment.
The subjective process that leads to the image did not deter Abbott from holding a strong belief in photography's capacity to convey essential truths about the world: "I believe in nature and truth, common sense and the pursuit of knowledge." She wanted to educate people, inform them about the true nature of science, and the image's strong connection to reality was of utmost importance, even if the reality was staged in a laboratory setting.
Reflexionslagen
Massachusetts, sent 1950-tal
Bild som demonstrerar att en ljusstråles infallsvinkel är lika med dess reflektionsvinkel. Det rektangulära papperet visar att både strålen och reflektionen är på samma nivå.
Pigmentutskrift
Laws of reflection
Massachusetts, late 1950s
Image that demonstrate that a light beam's angle of incidence equals its angle of reflection. The rectangular paper shows that both the beam and the reflection are on the same plane.
Pigment print
Tidsexponering av stående vågor
Massachusetts, sent 1950-tal
Tidsexponering visar cirkulära stående vågor i en vågrörelseapparat
Pigmentutskrift
Time exposure of standing waves
Massachusetts, late 1950s
Time-exposure shows circular standing waves in a ripple tank
Pigment print
Photo: Jakob Joelson/Västerbottens museum

BERENICE ABBOTT — Abbott and Arendt

Abbott's mission to visually represent science touches on a question raised by philosopher Hannah Arendt in The Human Condition (1958): What happens to the human condition in an age when science and technology has a profound impact? How does our perception of humanity change when viewed from the vastness of space or through the lens of a microscope? What effect does the scientific perspective have on our personal understanding of human existence?

Photographs like Abbott's, which reveal the phenomena studied within science, can offer some insight regarding the observed reality. However, they can also evoke feelings of limited understanding and insignificance. Arendt argued that natural science might distract us from humanistic reflection: by uncovering abstract truths about reality, science could potentially weaken rationality and diminish the tangible, human experience of the world.

This idea underscores the value of photographic explorations of science, as images not only depict but also help to make scientific knowledge more comprehensible. Despite their abstract and poetic qualities, Abbott's photographs have played a crucial role in visualising and explaining scientific phenomena, especially when – as they often were – paired with textual explanations in educational contexts. Without the visual image, the level of abstraction would be even greater; by observing reality through an image, we are given the opportunity to form our own understanding of what we see. In this way, images of science serve as a foundation for interpersonal communication about abstract realities.

Photo: Jakob Joelson/Västerbottens museum

LENNART NILSSON

The exhibition showcases a selection of Lennart Nilsson's images from 1952 to 1975, highlighting both the passage of time and the evolution of his techniques and the varying scales in his work. Through experimentation, Nilsson discovered new ways to view the world through technology. His access to technical resources and skilled personnel was essential, and his ability to establish a laboratory at the Karolinska Institute played a pivotal role in his work.

Although Nilsson spent many years at the Karolinska Institute, he never held an official position there. He remained a freelance photographer, benefiting from unique access to the necessary material resources for his work. To fund his practice, he secured agreements with external partners such as Life magazine, Bonniers förlag, and the German pharmaceutical company Boehringer Ingelheim.

Nilsson's ability to work across different fields and have his images appear in both commercial and scientific contexts was key to the attention his projects garnered. Particularly impactful were his images of the human interior, especially in the years following the Apollo 11 moon landingDuring this time, there was a growing fascination with using images to explore both the vastness of space and the intricacies of the microscopic world. The 1969 moon landing symbolised humanity's aspiration to explore and conquer previously inaccessible realms of the universe. In Nilsson's case, this exploration turned inward, focusing on the intricacies of the microcosm previously hidden from public view.

Storytelling was central to Nilsson's work, much like in documentary photography, and his background as a press photographer influenced how he depicted the human interior. However, unlike traditional documentary photographers who tend to capture visible aspects of society, Nilsson's images in the exhibition reveal what lies beyond the eye's perception, often within the context of a laboratory setting.

LENNART NILSSON — The Interaction Between Technology and People

During Nilsson's career, visualisation techniques advanced significantly, expanding the possibilities of what could be captured in an image. Nilsson was deeply involved in this progress, driven by his commitment to making complex scientific concepts accessible to the public through innovative imaging methods.

In the images, there is little trace of the laboratories, equipment, collaborations, and experimentation that contributed to the final visual result. The smooth surface of the image seems to erase the arduous process, and when the image is finally presented to the public, the distance to the laboratory is vast. However, when it comes to Nilsson's images, it is important to bare in mind the processes that preceded the image. By becoming familiar with his working methods, we can understand how Nilsson emerged as one of Sweden's most internationally recognised photographers. It becomes clear that his success was largely attributed to the interplay between people and technology.

Nilsson was a prominent figure in scientific circles, which granted him access to subjects that would have otherwise been challenging to photograph. The widespread acclaim of Nilsson's images, both nationally and internationally, led to his being permitted in the late 1960s to set up equipment at the Department of Forensic Medicine at the Karolinska Institute. This access provided him with the resources necessary to bring his ideas to life in collaboration with technicians and researchers. In this environment, he acquired sufficient knowledge about the instruments to portray the body's internal landscape at a microscopic level. The laboratory became the central point for his ongoing interactions with researchers, doctors, laboratory assistants, and other collaborators over many years.

Photo: Jakob Joelson/Västerbottens museum

LENNART NILSSON — Lennart Nilsson and Objectivity

Similar to many contemporary documentary projects, the distinction between the authentic and the staged in Nilsson's images is not always clear. The realities depicted often contain fictional elements, such as a fetus appearing to float in space. Researcher Solveig Jülich notes that Nilsson's images are not so much about fidelity to nature – i.e., objectivity – but were developed to educate and appeal to the viewer. Despite this, Nilsson asserted – especially in relation to his images made with scanning electron microscopy – that he was objective and that subjectivity had no role in his image making.

The concept of objectivity in science has evolved over time, with objectivity and subjectivity no longer seen as strictly opposing forces. Whereas objectivity was once considered a portrayal free from human influence, today more emphasis is placed on an objectivity which is legitimised by its entrenchment in knowledge which has developed over time.

The perception of images as objective is influenced by the context in which they are presented. Nilsson's images were produced and published in reputable and authoritative settings, which contributed to their acceptance as reliable. Since their initial publication, his iconic images have been integrated into a significant knowledge framework. Whether objective or not, the images have convinced people since the 1960s that a foetus's first months look like the images in the book *A Child is Born*.

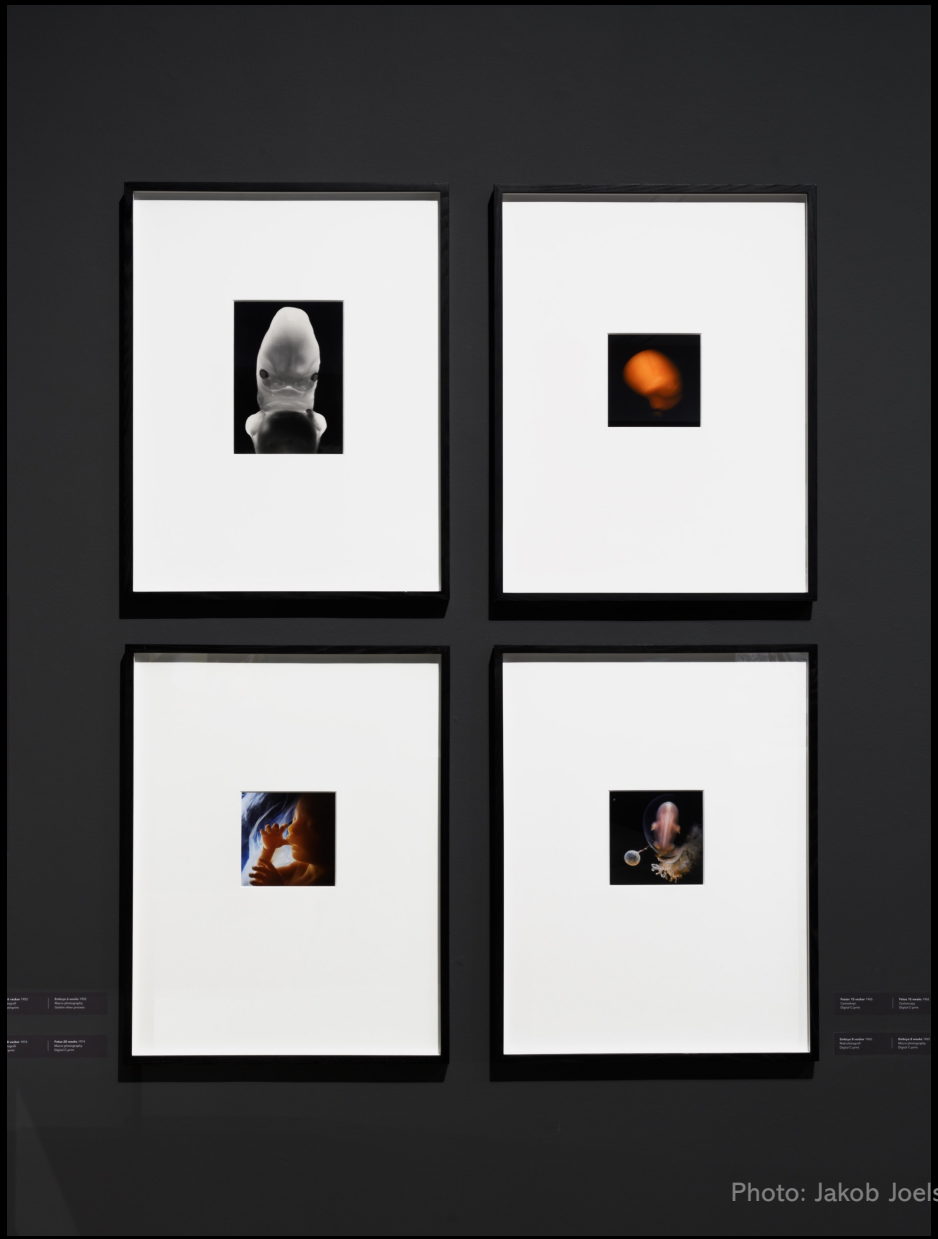


Photo: Jakob Joelson/Västerbottens museum

LENNART NILSSON — Ethical Issues and Controversies

As Nilsson's images circulated in magazines and other venues, they became part of broader narratives, such as the story of human development. Additionally, there are important narratives regarding Nilsson's working methods and the use of his images outside scientific contexts, particularly those depicting foetuses. These images played a role in reforming sex education, where Nilsson's detailed photographs of foetal development were used to create educational materials that replaced traditional drawings and specimens. They were also appropriated by the anti-abortion movement – without Nilsson's consent – to support their stance against abortion.

Media coverage of the Swedish abortion law in the 1950s, during which Nilsson's photographs circulated, evolved over the decades from strong opposition to acceptance of the legislation. This change is also evident in Nilsson himself, who initially held a somewhat negative view of abortion but later came to advocate for personal choice and women's autonomy over their own bodies. As researcher Solveig Jülich observes, "The publication of Nilsson's early photographs of embryos and foetuses in Sweden was driven by a mix of personal, commercial, political, and professional interests."

Although Nilsson managed to photograph a living fetus within the womb as early as 1965, most of the fetal images from the 1950s and 1960s were taken using a saline solution tank. These images depict fetuses from miscarriages, ectopic pregnancies, and legal abortions. What appears as a starry sky in the images is actually composed of small particles from the placenta and bubbles in the water. Today, undertaking a similar project would be challenging, if not impossible.

LENNART NILSSON — Imaging Techniques: Scanning Electron Microscopy

In 1974, the cover of *Läkartidningen* featured an image created by Nilsson using scanning electron microscopy. By partnering with the Japanese scientific instrument manufacturer JEOL, Nilsson was able to rent a scanning electron microscope capable of producing the highest-resolution images available at that time. This technique complemented his previous use of light microscopy and endoscopy.

Unlike conventional photography, scanning electron microscopy does not rely on reflected light. Instead, it uses an electron beam that scans across the specimen. The resulting image is formed by the interaction between electrons and the specimen rather than by light. To create an image, the specimen is coated with a thin metal layer, generating a voltage difference between the emitted electrons and the sample. The resulting image shows the specimen's topography through varying light and dark spots, and the technique produces images in black and white.

Nilsson worked with researchers to review and select the images. Once the black-and-white scanning electron microscopic images were ready, he photographed the display screen using a Hasselblad camera equipped with a specialised close-range lens positioned in front of the microscope screen. The creation of these images involved the intricate interplay between the biological material, the scientific instrument, the human operators, and the camera.

Färgläggning av bilder

De svartvita bilder som Nilsson genererade med hjälp svepelektronmikroskopet fotograferade i större delen av hans karriär. Det var först under 2000-talet som det blev möjligt att färglägga bilderna på ett enkelt och relativt snabbt sätt. Nilsson har själv använt sig av denna teknik endast vid ett fåtal tillfällen, och då för att illustrera sina föreläsningar. Han har aldrig använt sig av färg i sina vetenskapliga publikationer, och Nilsson ansåg själv att färgläggning av bilder var en mycket dyrbar process.

Viktiga resultat av komplicerad och ofta tidskrävande forskning som bygger på en vetenskaplig utrikning får på bestämda sätt och med hjälp av bestämda metoder. Det är därför Nilsson tillsammans med kollegan Birgitta Högbom Viklegg mellanregelbundet manuellt i sitt laboratorium, vilket kunde ta veckor för en enskild bild.

Eftersom Nilsson ville att en bred publik med stor förståelse skulle kunna ta del av hans bilder, bestämde Högbom-Viklegg att dessa bilder skulle färgläggas. Det var ett tidskrävande och mycket komplicerat arbete som krävde mycket av konstnärlig känsla och förståelse för ämnet. Det var också ett arbete som krävde att man hade en god förståelse för ämnet och för det material som skulle färgläggas. Det var också ett arbete som krävde att man hade en god förståelse för ämnet och för det material som skulle färgläggas.

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Coloring of images

The black and white images created by Nilsson using the scanning electron microscope were then colored by the photographer and expert Birgitta Högbom Viklegg. This was a time-consuming process that could take weeks for a single image. Nilsson himself only colored a few images in his lectures, as he considered coloring images to be very costly.

Viklegg developed a complex coloring technique based on mathematical calculations to determine which tones to use. This technique was developed in collaboration with Nilsson. Viklegg manually colored the negatives in a laboratory, a process that could take weeks for a single image.

Since Nilsson aimed to reach a broad audience with his images, he decided that Viklegg should color the images using complex formulas. The colors contributed to the sense of authenticity, at the same time as they complicated coloring and required a great deal of knowledge about the subject and the correlations held as most insight as fast based on.

Color photography was gaining ground in advertising and printed photography during this time. However, despite its increasing popularity in some contexts, there was also skepticism. Color photography was considered by many to be similar to reality. In scientific contexts, color images were far from uncommon. Some argued that scientific objectivity was compromised by the use of color. The addition of color to the original image overlaid more information, and also provided an inaccurate representation of reality. Despite these concerns, color photography was widely welcomed in the scientific community because its enthusiasm for medical images, combined with its interest in aesthetics, led to images that had no previously been seen.

Läs mer om Birgitta Högbom Viklegg och hennes färgläggningsmetod i ”Tillsammans med konstnären: Färgning av bilder” på denna vägg.

Read more about Birgitta Högbom Viklegg and her coloring method in ”Together with the artist: Coloring of images” on this wall.

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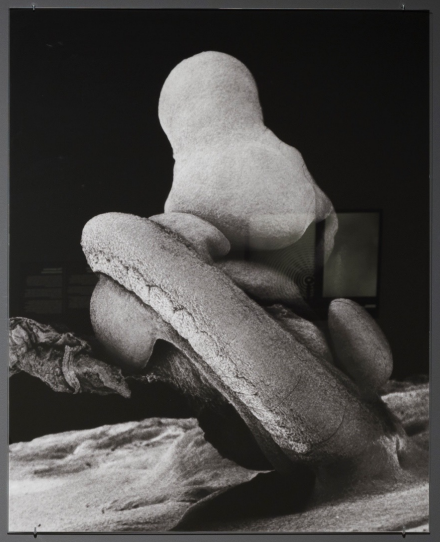
Bildyta: drivet 2,7 cm upplös: 11 % Fjärrkontroll



Avbildande tekniker: svepelektronmikroskopi

År 1956 grundade Lilliemånsgymnasiet en institution där Nilsson gavs med hjälp av svepelektronmikroskop. Genom att använda denna teknik kunde Nilsson, som var verksam under 1950- och 60-talen, som Nilsson också själv uttryckte det, bidra till att göra Lilliemånsgymnasiet till ett av världens ledande centra för svepelektronmikroskopi.

Svepelektronmikroskopi bygger, till skillnad från konventionell fotografi, inte på ljus som reflekteras. I stället är det en elektronstråle som ”skannar” av ytan av provet. Det är därför som det kallas för ”svepelektronmikroskopi”. Det är också därför som det ger upphov till bilder. Det var av detta skäl som Nilsson gravitera till denna teknik. Det var också av detta skäl som han ansåg att den var särskilt lämplig för att avbilda mineraler och andra oorganiska material, som till exempel kristaller och metaller.

I samspråk med Nilsson grundade Nilsson Gällevis och Lilliemånsgymnasiet en institution där Nilsson gavs möjlighet att använda sig av denna avbildande teknik. Nilsson använde sig av denna teknik för att avbilda mineraler och andra oorganiska material, som till exempel kristaller och metaller. Det var också av detta skäl som han ansåg att den var särskilt lämplig för att avbilda mineraler och andra oorganiska material, som till exempel kristaller och metaller.

Imaging technique: Scanning Electron Microscopy (SEM)

In 1956, the owner of the Swedish Medical Journal (Läkartidningen) featured an image created by Nilsson using a scanning electron microscope. This image was created with a Japanese manufacturer of scientific instruments. JEOL. Nilsson was able to start advanced medical circulatory research and publications in the early 1960s, which made him one of the most high-resolution images in the country. This method supplemented Nilsson's previous use of light microscopy and photography.

Nilsson's scanning electron microscopy differs from conventional photography, does not rely on light being reflected. Instead, a beam of electrons is used that is directed at the sample. This is why it is called a "scanning electron microscope" or SEM image. To generate an image, the sample needs to be conductive. Nilsson's choice of this technique was due to the difference between the electrical properties of the materials. The interaction between the electrons and the atoms in the sample produces signals that contain information about the topography through bright and dark areas. Scanning electron microscopy portrays the world in black and white.

In dialogue with scientists, Nilsson reviewed the images and made a selection. Once the black and white photographs were developed in the darkroom, Nilsson photographed the image displayed on the screen. The photographs were then digitally processed and printed with a computer. Using a magnifying glass and a microscope, Nilsson examined the finished photographs. The photographs assumed a form of the microscopic screen. The ecological perspective of the microscope is also reflected in the fact that the camera is placed on intricate role in the process of viewing these images.

LENNART NILSSON — Traces of Subjectivity

One of the connections between Nilsson's works and more contemporary photography based images is that the artist does not shy away from appearing in his own images. While self-portraiture was not a primary focus for Nilsson, he occasionally features himself, as if to remind the viewer that there is an author behind the lens.

For example, in the photograph where he is seen through the eye of a fly. The image almost acts as a caricature of the documentary photographer as a 'fly on the wall' – someone who attempts to objectively capture events without interference. This concept is humorously challenged in a 1959 image where Nilsson, smiling and holding a flyswatter, appears to question the 'fly-on-the-wall' perspective. Additionally, his numerous images of eyes, both human and animal, emphasise the act of seeing and the significance of the eye itself.

Photo: Jakob Joelson/Västerbottens museum

LENNART NILSSON — Colouring Images

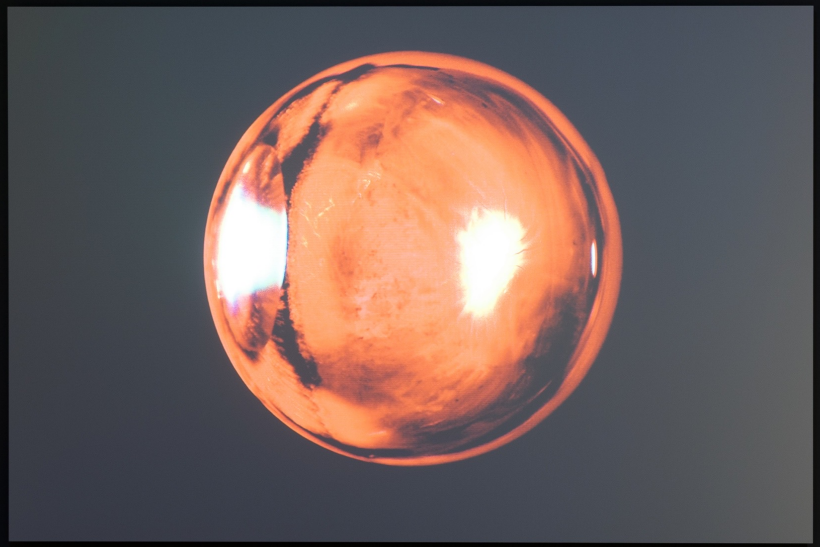
The black-and-white images produced by Nilsson using the scanning electron microscope were later coloured by photographer and printer Gillis Häägg. Their collaboration began in 1969 and continued for over three decades, concluding with their final work on A Child is Born in 2003. However, due to the high cost of the colouring process, most of the scanning electron microscope images remain in black and white.

Häägg developed a sophisticated colouring technique based on mathematical calculations to select the appropriate tones. Once he and Nilsson agreed on a colour scheme, Häägg meticulously hand-coloured the intermediate negatives in a laboratory, a process that could take weeks for a single image.

Nilsson aimed to reach a broad audience with his scanning electron microscope images, making colourisation crucial for capturing public interest. While the colours added a sense of authenticity, the meticulous colouring process also highlighted the elaborate artistic effort, where aesthetic decisions were as important as factual accuracy.

At the time, colour photography was just beginning to gain traction in advertising and private photography, though it faced some scepticism. Colour images were sometimes seen as too close to reality, which led to controversy in scientific contexts, where there was concern that colour might compromise scientific objectivity. The detailed grayscale of the original images was considered to contain more information, while colour was thought to offer a potentially misleading representation of reality. Despite these reservations, Nilsson's images were well-received within the scientific community, as his dedication to medical imaging and his artistic sensibility produced groundbreaking visuals that had never been seen before.

Solveig Jülich has described this process in “Colouring the human landscapes: Lennart Nilsson and the spectacular world of scanning electron micrographs” *(2014).*



Färgläggning av bilder

Coloring of Images

Photo: Jakob Joelson/Västerbottens museum


Photo: Jakob Joelson/Västerbottens museum

FORENSIC ARCHITECTURE

In the work of Forensic Architecture, we see how photography, in its expanded contemporary form, can be leveraged to spotlight urgent issues. This broadened scope of photography, which includes moving images and digital visualisations, enables viewers to see what might otherwise remain hidden. Forensic Architecture's projects focus on human rights violations, especially in instances where the truth about these abuses has been obscured or withheld from the public. Through meticulous investigations, they gather evidence that can be used to bring the perpetrators to justice.

Forensic Architecture's work differs from much of contemporary art in that it has an explicit and instrumental purpose. The materials they gather are intended to serve as evidence to demonstrate that crimes have taken place. These investigations, or "cases," are exhibited in both art institutions and courtrooms. Collaborating with international bodies like the United Nations (UN) and Amnesty International, Forensic Architecture operate in a variety of settings, all aimed at supporting communities impacted by state violence and persecution.

Their methodology illustrates that art can sometimes function similarly to detective work. Employing forensic techniques – scientific methods for investigating criminal acts – Forensic Architecture traces the evidence of crimes. This evidence often relates materially to architecture. While testimonies are typically articulated by individuals, here, the evidence is tied to the existence of physical objects. Forensic Architecture meticulously investigates and maps buildings and urban landscapes to reveal signs of violence, bringing to light traces that are barely visible and placing them in context.

Based at Goldsmiths College in London, Forensic Architecture identifies as a research agency. Their interdisciplinary team includes architects, artists, filmmakers, software developers, scientific researchers, and lawyers, who work in partnership with international organisations and various non-governmental groups. The strong research basis of their work is evident in the way they convey their findings. By developing precise concepts that clearly define their objectives and methods, Forensic Architecture effectively controls the narrative. When they present their cases, they do so through persuasive, painstakingly crafted visual and verbal arguments.

Photo: Jakob Joelson/Västerbottens museum

Forensic Architecture — Innovative Ways to Trust Images

To evaluate images today the same ways we did before the digital era is futile. When an AI-generated image can appear just as realistic as a traditional photograph, we need new approaches to determine an image's credibility. How to trust images when the internet is saturated with fabricated visual content? How does the role of photography in society change when most of today's images do not adhere to the same principles as traditional photography? And how can photography serve as reliable evidence when technology allows synthetic content to be created, materialised, and disseminated within seconds?

Filipino journalist and Nobel laureate Maria Ressa has highlighted the dangers of the current era with regards to the erosion of facts. She asserts that without facts, there is no truth; without truth, no trust; and without trust, we cannot tackle the world's challenges. Photographs are not automatically proofs of anything, but they have had a crucial role in conveying truths. If the credibility of images is fundamentally compromised, photographs that fill the purpose of documenting historical and contemporary violations may no longer effectively serve as evidence.

Thus, new methods for trusting images are needed. Forensic Architecture have developed processes which serves to address the credibility of the images and other material presented. An example of this is their website which includes detailed explanations of their procedures. The openness – which resembles the scientific transparency – is key to how they communicate their findings. By sharing and being open with the methods and techniques they have employed, Forensic Architecture allow the audience to independently evaluate the credibility of the material.


Photo: Jakob Joelson/Västerbottens museum

Forensic Architecture — Techniques for Gathering Evidence

Photography today is a broad field and does not always involve a human operating a camera. Forensic Architecture embodies this shift by employing a wide range of techniques that reflect the evolution of contemporary photography practices. These techniques include surveillance footage, 3D modelling, LiDAR scanning, photogrammetry, ground-penetrating radar, sound analysis, and digital simulations – techniques that are mapped on their website into categories such as machine learning, simulation, and virtual reality.

The piece *Situated Testimonies* in the exhibition presents some of Forensic Architecture's methods for working with witnesses. By utilising visual materials, oral testimonies, and other innovative approaches, they reconstruct past events. In this process, memories play a crucial role. Although memories can be fragmented and elusive, digitally recreating an event can help a witness recall important details. These digital reconstructions allow reality to be revisited and the technologically sophisticated installations developed by Forensic Architecture contribute to the spread of new knowledge.

Forensic Architecture’s work goes beyond compiling, articulating, and presenting; it also underscores the idea that complex issues require complex solutions. In the post-truth era, where the lack of credible facts allows falsehoods to flourish, Forensic Architecture provides counter-narratives. The founder of the research agency, Eyal Weizman, asserts that truth should be considered a “common resource” which is not owned by a particular interest but rather serves the benefit of society. For the truth be meaningful and impactful, it needs to be made public and accessible.

Forensic Architecture — Engaged Objectivity

In the art world, the notion of objectivity came under severe scrutiny in the 1980s, with postmodern critique challenging the idea of objective truths. Ever since, objectivity has been associated with power and oppression, often seen as both impossible and undesirable.

If not as an impartial, disengaged ideal, how can objectivity be understood? Eyal Weizman proposes that a non-neutral objectivity can serve as a vital tool in the search for truths. He describes this as "engaged objectivity," which recognises the impact of political motives and subjective choices on the results. In this spirit, Forensic Architecture's investigations are driven by what those involved in the cases consider important. Personal motivations consequently play a key role for engaged objectivity – an approach that calls for strict research standards while acknowledging that objectivity is never entirely neutral.

In documentary photography, the notion of objectivity has been contested, and documentary artists often stresses the subjective nature of their work. However, the idea of engaged objectivity as put forward by Weizman is interesting from a documentary point of view. Forensic Architecture’s work retains a documentary quality, as it is grounded in real events and plays a role in public discourse. Even though their methods and visual approach have little in common with the analogue image series typical of traditional documentary photography, their perspective can infuse documentary photography with new viewpoints.

Forensic Architecture

Hos Forensic Architecture ser vi exempel på hur fotografi, som det utvidgade fält det är idag, kan användas för att uppmärksamma angelägna frågor. Fotografi omfattar rörlig bild och digitala visualiseringar och möjliggör för betraktaren att se det som annars skulle vara dolt. Forensic Architectures arbeten behandlar brott mot mänskliga rättigheter, i fall där sanningar om övergreppen har förvrängts eller hemlighållits från allmänheten. Genom omfattande undersökningar sammanställer de bevismaterial som kan användas för att ställa de skyldiga till svars.

Till skillnad från mycket annan konst har Forensic Architectures projekt instrumentella syften. Det material som de sätter samman ska kunna användas som evidens för att bevisa att brott har begåtts. Deras undersökningar, eller fall ("cases"), presenteras både på konstinstitutioner och i rättegångssalar. De samarbetar med internationella organisationer som Förenta nationerna (FN) och människorättsorganisationen Amnesty International. Att de figurerar i så olika sammanhang hänger ihop med deras mål: Att stötta dem som drabbas av statligt våld och förföljelse.

Deras förfarande visar att konst ibland kan vara snarlikt ett detektivarbete. Med hjälp av forensiska tillvägagångssätt, alltså vetenskapliga metoder för att utreda brottsliga handlingar, undersöker Forensic Architecture spår av brott. Det bevismaterial som presenteras har ofta en materiell koppling till arkitektur. Medan vittnesmål ("testimonies") formuleras av människor, är bevismaterial ("evidence") här kopplade till tingens existens. Forensic Architecture undersöker och kartlägger därför byggnader och stadsmiljöer i detalj för att urskilja tecken på våldshandlingar. Spår som är på gränsen till oskönjbara blottläggs och kontextualiseras.

Med Goldsmiths College i London som bas beskriver sig Forensic Architecture som en forskningsagentur. Det tvärvetenskapliga teamet utgörs av arkitekter, konstnärer, filmmakare, mjukvaruutvecklare, vetenskapliga forskare och advokater, som i sin tur samarbetar med internationella organisationer och andra ickestatliga aktörer. Att deras arbeten är djupt förankrade i forskning kan också märkas i hur de kommuniceras. Genom att introducera distinkta begrepp, som med precision beskriver varför och hur de arbetar, tar Forensic Architecture kontrollen över berättandet. När de presenterar sina fall görs detta på övertygande sätt genom väl genomarbetade visuella och verbala argument.

Forensic Architecture's work demonstrates how photography, as the expanded field it is today, can be used to draw attention to urgent issues. Photography, which encompasses moving images and digital visualizations, enables the viewer to see what would otherwise remain hidden. Their work deals with human rights violations in cases where truths about the abuse have been distorted or kept secret from the public. Through extensive research, Forensic Architecture compile evidence which can be used to bring offenders to justice.

Unlike much other art, Forensic Architecture's projects serve instrumental purposes. The material they assemble is intended to be used as evidence to prove that crimes have been committed. Their research, or cases, are presented in both art institutions and court rooms. They work together with international organizations such as the United Nations (UN) and the human rights organization Amnesty International. The fact that they appear in such different contexts is linked to their aim: To support those who suffer from governmental violence and persecution.

Their methods demonstrate that art can at times resemble detective work. Using forensic procedures, which are scientific approaches to investigating criminal acts, Forensic Architecture investigates traces of crime. The evidence that is presented often has a material connection to architecture. While testimonies are formulated by humans, evidence is here connected to the existence of objects. For this reason, Forensic Architecture investigates and maps buildings and urban environments in detail to discern signs of violent acts. Traces that are almost imperceptible are exposed and contextualized.

With Goldsmiths College in London as the base, Forensic Architecture describes themselves as a research agency. The interdisciplinary team consists of architects, artists, filmmakers, software developers, scientific researchers and lawyers, who in turn collaborates with international organizations and other non-governmental organizations. The fact that their works are deeply rooted in research can also be seen in how they are communicated. By introducing distinct concepts, that with precision describes why and how they work, Forensic Architecture takes control over the narrative. When they present their cases, they do so convincingly through well-crafted visual and verbal arguments.

Photo: Jakob Jakobsson/Västerbottens museum

THE PROJECT ROOM

Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Albert Sten
Mörkerseende

Mörkerseende consists of archival material from a family album that has been AI-generated into moving images. The archival material comprises glass negatives that were scanned in the early 2000s, resulting in low-resolution source material. The artist worked with this information scarcity to explore the outcome of AI-generated enhancement.

The focus on the eyes in the work stems from one of the most fundamental forms of human communication – eye contact. What happens when still images are turned into moving material? The recurring gazes become an encounter with an archive, artificial memories of relatives, and a critical examination of how real the generated eyes appear – as a repeated, lifeless algorithm or a window to the soul.

Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Kate Crawford & Vladan Joler
Anatomy of an AI System

Anatomy of an AI System maps the human labour, data, and planetary resources involved in creating and operating Amazon's Echo speaker. The actual costs – social, environmental, economic, and political – are often concealed.

This work brings together and visualises the intricate processes required to sustain a large-scale artificial intelligence system, including material resources, human labour, and data.

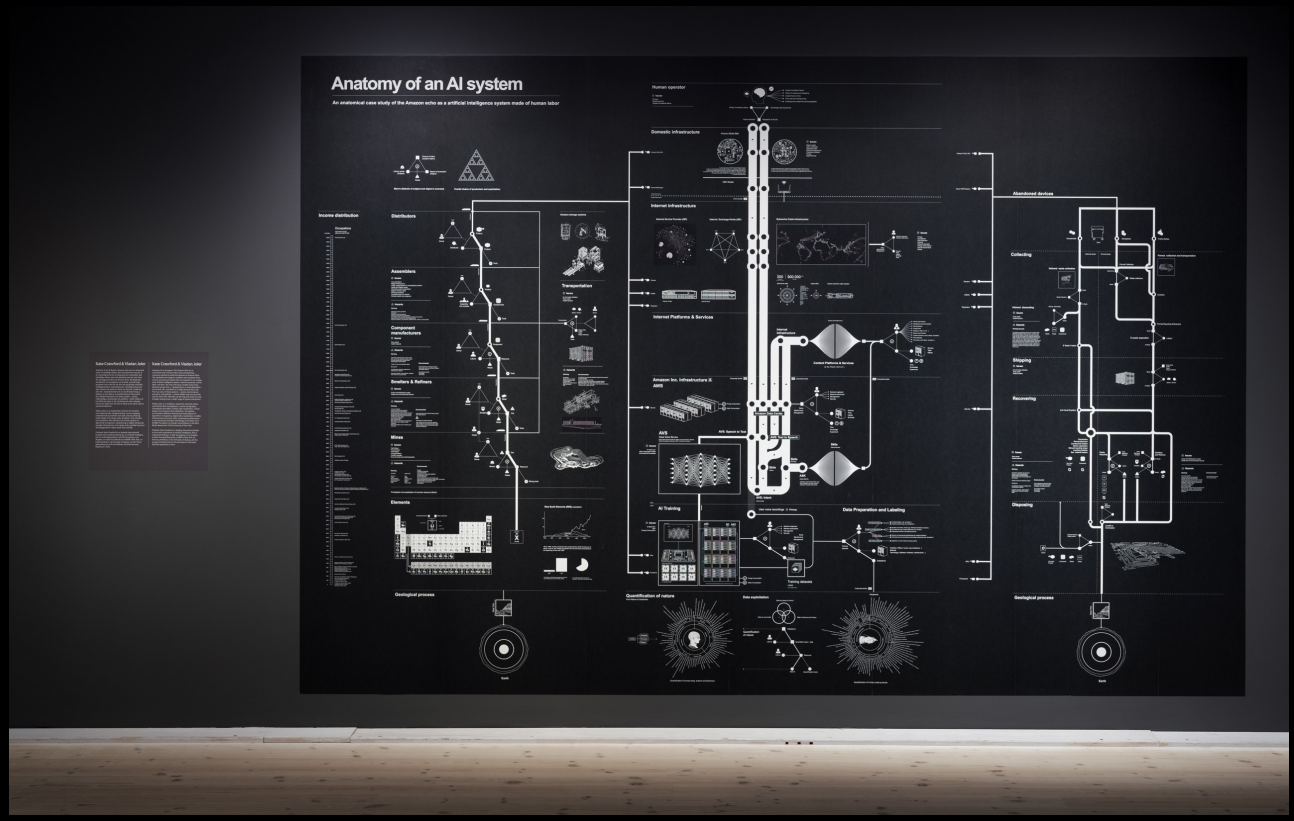


Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Krister Hägglund
Stordiket

In *Stordiket*, Krister Hägglund revisits the same location over several years to document the changes in the landscape. What began as a fascination with an archival photo of a boy in a ditch evolved over time, from traditional re-photography into an infinite recreation with the help of an AI algorithm.

"One day, I made a copy of a photo of a boy standing in a large, freshly dug ditch. The image was made by Tor Ekholtz in 1926. [...] In 1998, I contacted Gustav Ask, who was 82 at the time, and in June made a series of images of him by the ditch. By the summer of 2022, I noticed that there was a lot of talk about AI-generated images online. The technology had advanced rapidly. So later that fall, I decided to try creating AI-generated images on the same theme. [...] The images I got resembled something out of a horror film from the 1920s."

Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Tyrone Martinsson

Tyrone Martinsson's research concerns the history and contemporary aspects of photography with a focus on landscape and environmental photography. He is especially interested in how photographic images can be used to explore the relationship between humans and nature, and how our perception of nature and landscapes changes over time.

In recent years, Martinsson has studied the Arctic and employed "rephotographic" methods for interdisciplinary research on climate, environment, and historical descriptions of polar landscapes. His research focuses on visual techniques and practices, as well as visual communication related to environmental and climate issues and humanity's connection to nature.

In 2003, he completed his doctoral thesis, *Photographic Archaeology and Nils Strindberg's Photographs from the Andrée Polar Expedition 1896–1897*, at the University of Westminster in London. This thesis explores photographs as both documents and artistic representations, illustrating how photo archives and collections can be revitalised.

Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Stephanie Dinkins
Conversations with Bina48

Can an artist and a social robot develop a relationship over time? Artist Stephanie Dinkins and Bina48, one of the world's most advanced social robots, explore this question through a series of filmed conversations. In *Conversations with Bina48*, Dinkins delves into the boundaries of human consciousness, what it means to be human, mortality, and our ability to exist beyond our physical bodies. They discuss topics such as family, racism, faith, the civil rights of robots, loneliness, knowledge, and Bina48's concerns that her robot friends are treated more like lab rats than people. Their conversations are entertaining and frustrating for both the robot and the artist, filled with humor, surprises, philosophy, and occasional absurdity.

Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Craig Aimes
Synthotypes of British and Foreign Ferns

In *Synthotypes of British and Foreign Ferns*, a collection of post-photographic synthesised specimens is presented, created using artificial intelligence image generation and algorithmic upscaling. These "synthotypes" represent a modern algorithmic reinterpretation of botanical specimens originally featured in Anna Atkins and Anne Dixon's *Cyanotypes of British and Foreign Ferns* (1853). This work highlights the recent dramatic changes in the automation and externalisation of representation in the era of algorithmic reproduction.

Photo: Jakob Joelson/Västerbottens museum

THE PROJECT ROOM

Craig Aimes
Evidential

Evidential features images generated by artificial intelligence (AI), created as a response to the 1977 photobook Evidence by Larry Sultan and Mike Mandel.

The first step of the artistic process was to produce digital reproductions of the photographs from *Evidence*, which an image-to-text AI then used to produce brief descriptive texts. These texts – one for each photograph – served as the foundation for the next step, where algorithms were directed to generate new black-and-white images. The final selection of images was further refined using AI.

The simulated "photographs" in *Evidential* offer a commentary on technological progress – highlighting both the rapid advancements towards photorealistic imagery as well as the shortcomings and limitations – of modern machine learning and AI-driven image processing.

Photo: Jakob Joelson/Västerbottens museum


Super Sight: A World Viewed Through Technology
Västerbottens museum 22 October 2023 – 7 April 2024