From Truth to Dialogue

Museums in a Post-Normal World

4th International Conference of the Leibniz Centre of Excellence for Museum Education
Diversity and Discourse: Engaging Museum Visitors in the 21st Century

Marianne Achiam ● Department of Science Education ● University of Copenhagen

Normal science – and museums

Science is universal, objective, and the inevitable product of a logical and systematic method

Aristotle (384-322 B.C.E.)

The four Mertonian norms (or CUDOS)

Communism: all scientists should have common ownership of scientific goods

Universalism: scientific validity is independent of the sociopolitical status/personal attributes of its participants

Disinterestedness: scientific institutions act for the benefit of a common scientific enterprise

Organised Skepticism: scientific claims should be exposed to critical scrutiny before being accepted

https://en.wikipedia.org/wiki/Mertonian_norms

Rationale For A Science Museum

Frank Oppenheimer, D
Reprinted from *Curator: The Mu*

There is an increasing need
understanding of science and
fruits of science and the prod
continue to shape the nature
to influence events which hav
significance. Yet the gulf betw
lives and experience of most pe
complexity of science and tech
widening. Remarkably few ind
familiar with the details of the in
processes involved in their food
medicine, their entertainment or
The phenomena of basic scienc
become the raw material of inv
easily accessible by the direct
observation of nature yet they
phenomena which have, for c
society, become as intriguing a
as a butterfly or a flower.

There have been many attempt
gap between the experts and t
attempts have involved books,
articles, television programs a
science courses in schools. But such attempts, although valuable, are at a disadvantage because they lack props; they require apparatus which people can see and handle and which display phenomena which people

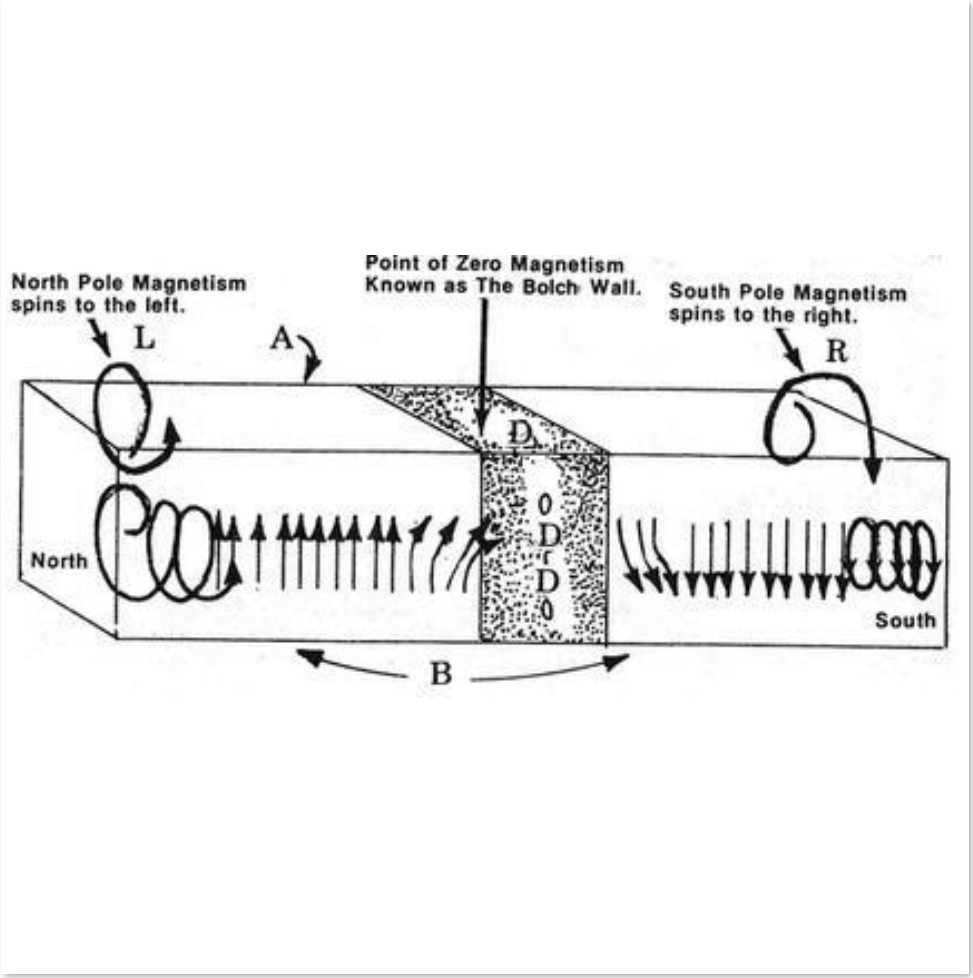
> There is thus a growing need for an environment in which people can become familiar with the details of science and technology and begin to gain some understanding by controlling and watching the behavior of laboratory apparatus and machinery; such a place can arouse their latent curiosity and can provide at least partial answers.

the developm ce and
technology and its roots in the past.

The purpose of a science museum and exploration center would be to satisfy this

Oppenheimer 1968: 206

science



Separation of the energies of a bar magnet, which also applies to all types of magnets. Image: www.magnetage.com

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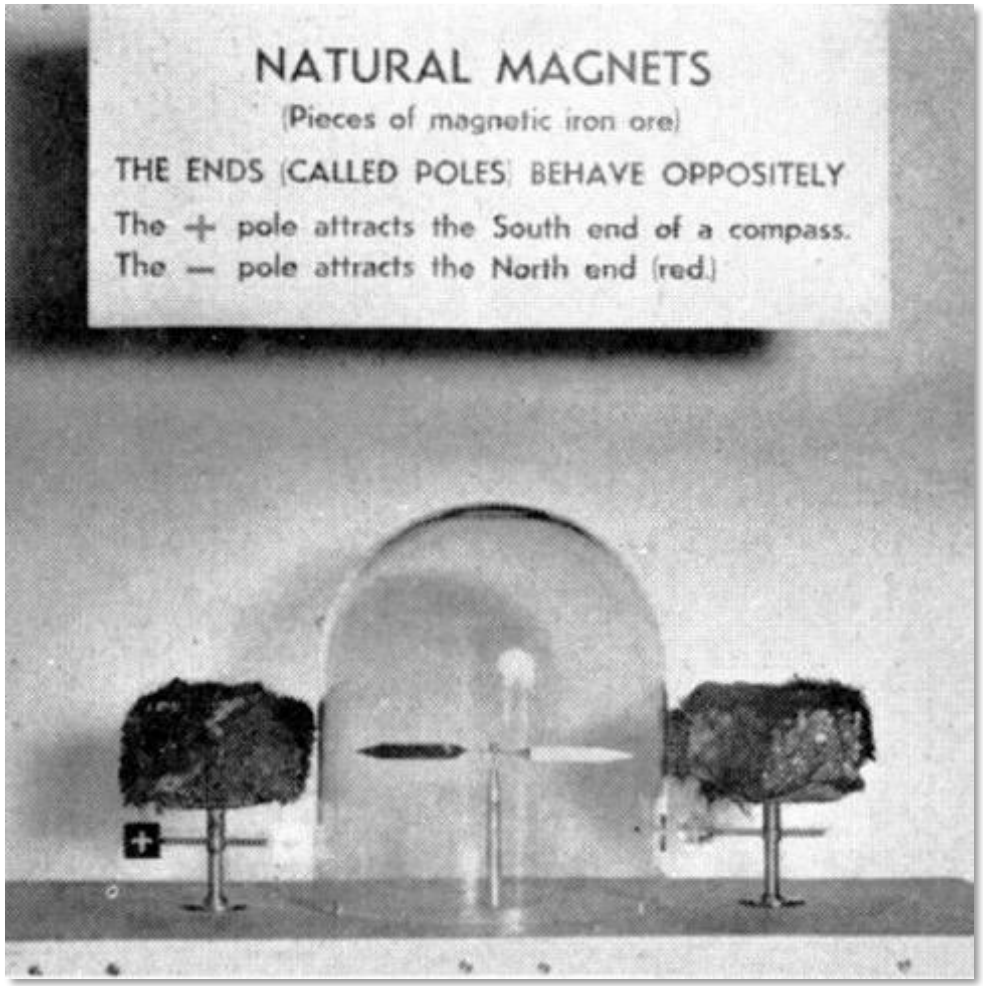
science centre

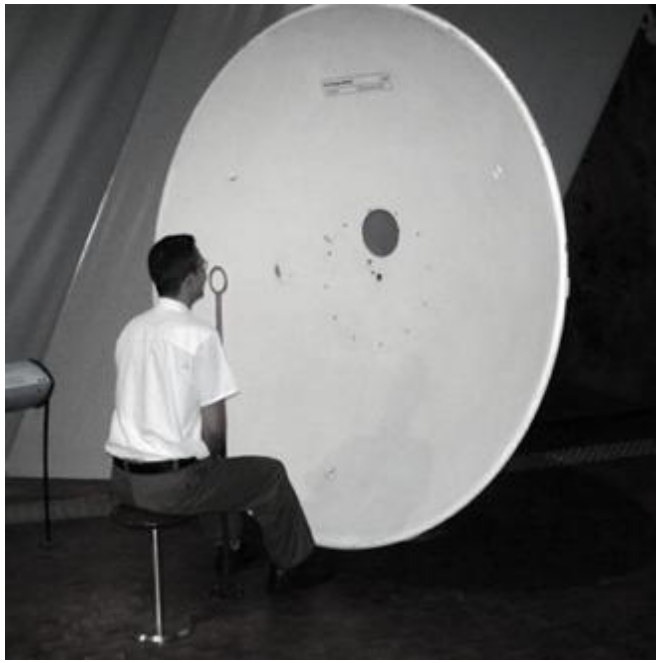


Interactive exhibit, Century of Progress International Exposition, Chicago, 1933. Image: Shaw 1932

‘Cloning’

The cloning syndrome: the copying of exhibits without consideration of context

Quin 1994: 44

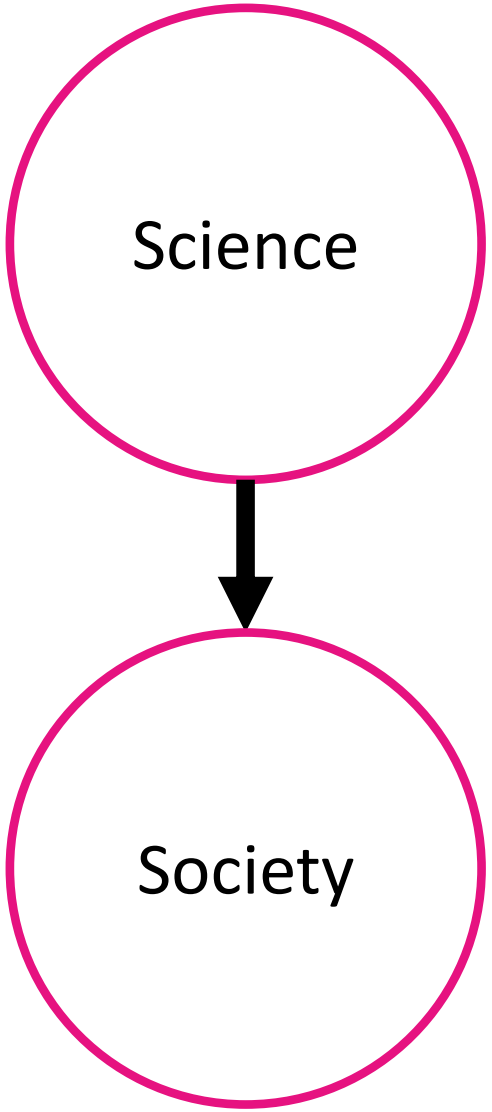


Whispering parabolas at Experimentarium

Image: Quistgaard 2005

Whispering parabolas at NEMO

Image: Achiam 2017



- Hierarchical, authoritative relationship
- One-way information flow
- Science as ‘the truth’

e.g. Dijkstra et al. 2020

Post-normal science – and museums

In the 1960s and 70s, a series of political and social developments challenged the
CUDOS idea
of science

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Beef crisis:

Facto

by 80

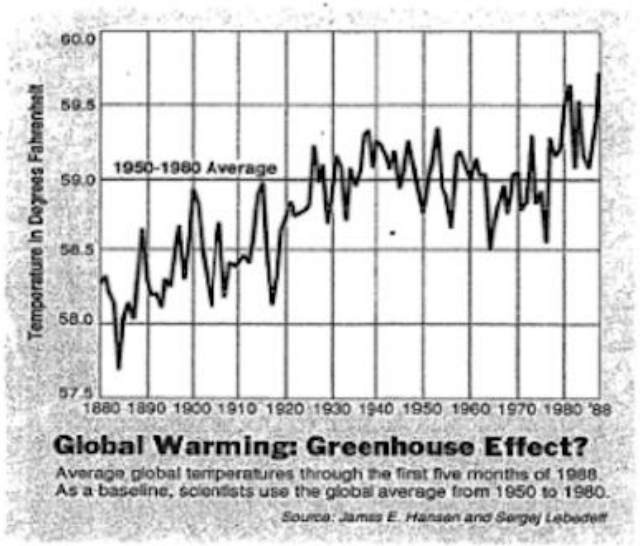
Aids help 'too late

"All the News That's Fit to Print"

The New York Times

VOL. CXXXVII . . . No. 47,546 Copyright © 1988 The New York Times NEW YORK, FRIDAY, JUNE 24, 1988

Global Warming Has Begun, Expert Tells Senate



Global Warming: Greenhouse Effect?

Average global temperatures through the first five months of 1988. As a baseline, scientists use the global average from 1950 to 1980.

Source: James E. Hansen and Sergej Lebedeff

The New York Times/June 24, 1988

Sharp Cut in Burning of Fossil Fuels Is Urged to Battle Shift in Climate

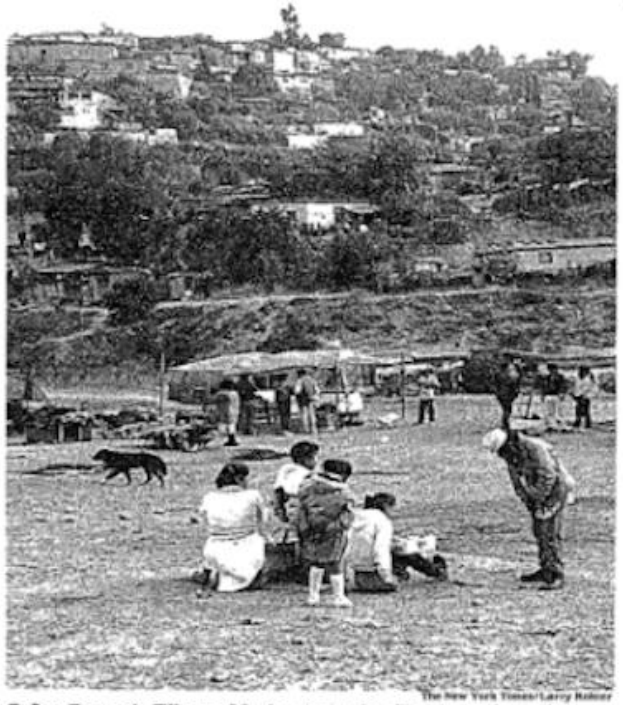
By PHILIP SHABECOFF
Special to The New York Times

WASHINGTON, June 23 — The earth has been warmer in the first five months of this year than in any comparable period since measurements began 130 years ago, and the higher temperatures can now be attributed to a long-expected global warming trend linked to pollution, a space agency scientist reported today.

Until now, scientists have been cautious about attributing rising global temperatures of recent years to the predicted global warming caused by pollutants in the atmosphere, known as the "greenhouse effect." But today Dr. James E. Hansen of the National Aeronautics and Space Administration told a Congressional committee that it was 99 percent certain that the warming trend was not a natural variation but was caused by a buildup of carbon dioxide and other artificial gases in the atmosphere.

An Impact Lasting Centuries

Dr. Hansen, a leading expert on climate change, said in an interview that there was no "magic number" that showed when the greenhouse effect was actually starting to cause changes in climate and weather. But he added, "It is time to stop waffling so much and say that the evidence is pretty strong



The New York Times/Larry Rohter

Cañon Zapata in Tijuana, Mexico, the busiest illegal crossing point.

Drought Raising Food Prices; Inflation Effect Seems Minor

By ROBERT D. HERSHEY Jr.
Special to The New York Times

ims'

and 17, who had been
ven US blood products.
The scientists cultured the
us and found that it at-
ked T helper cells — the
ite cells in the body's im-
ne system which are de-
ed in Aids victims. They
e also isolated the virus
n several Aids patients :
omosexual man with the
cancer, Kaposi's sar-
, a Haitian man, and a
an from Zaire.
ly one of the
ophiliac brothers devel-
Aids, and Dr
agnier suggests that the
is activated by other
ions, such as hepatitis,
is widespread among
exuals.
American virus is
human T-cell
nia virus Type III
III). Dr Gallo has
antibodies to HTLV
88 per cent of Aids
tested so far ; in 79
t of patients with de-
T-cells but few other
mptoms ; and, most
of all, in more than
er of homosexuals
signs of Aids.

Post normal science

Whereas science was previously understood as steadily advancing in the certainty of our knowledge and control of the natural world, now science is seen as coping with many uncertainties in policy issues of risk and the environment. In response, new styles of scientific activity are being developed.

Funtowicz & Ravetz 1993: 739

Post normal science

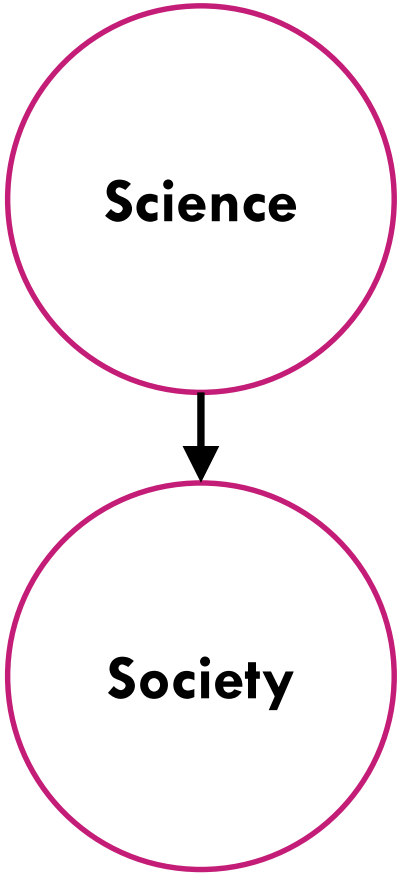
A post-normal science issue is one where facts are uncertain, values in dispute, stakes high and decisions urgent.

Funtowicz & Ravetz 1993: 744

Science for sustainability	*Science of sustainability*
Mode-1 sustainability science	Mode-2 sustainability science
Monodisciplinary	Interdisciplinary and transdisciplinary
Highly focused	Broadly based
Normal science	Post-normal science
Curiosity driven and problem solving	Critical research
Academic	Academic and social
Academic peers	Extended peer community
Certainty	Uncertainty and ignorance
Hierarchical logic	Relational logic
Scientific proofs, unequivocal results	Discursive processes, ranges of options
Top-down, command and control	Discursive process of opening up and closing down
Stakeholders affected	Stakeholders involved

Spangenberg 2011

This points to a (somewhat radical) new role for science communication



This points to a (somewhat radical) new role for science communication

What does this look like?

MUSEUM MANAGEMENT AND CURATORSHIP, 2017
VOL. 32, NO. 2, 123–143
http://dx.doi.org/10.1080/09647775.2016.1266282

Routledge
Taylor & Francis Group

Nine meta-functions for science museums and science centres

Marianne Achiam and Jan Sølberg

Department of Science Education, University of Copenhagen, Copenhagen, Denmark

ABSTRACT

Science centres and science museums face challenges such as increased accountability, increased demands for accessibility, and growing competition from leisure experiences. On their own, the traditional museum practices of preservation, communication, and research are insufficient to address these challenges. Accordingly, we use the framework of eight museum meta-functions, presented by Dubuc [2011. "Museum and University Mutations: The Relationship Between Museum Practices and Museum Studies in the Era of Interdisciplinarity, Professionalisation, Globalisation and New Technologies." *Museum Management and Curatorship* 26 (5): 497–508] and further developed here, to understand how these institutions respond to calls for change. We analyse the presentations of staff members from 21 science centres and science museums, given at the 2013 Ecsite conference, to map out how these institutions address modern-day challenges. This analysis generates a new framework of nine meta-functions for science centres and science museums that can guide and help qualify discussions about their present and future activities. We discuss the new meta-functions as evidence of a turn away from the self-referential museum functions of the past, towards a more complete externalisation of purpose.

ARTICLE HISTORY
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KEYWORDS
Museum functions; science centre; science museum; future roles; Ecsite; externalisation of purpose

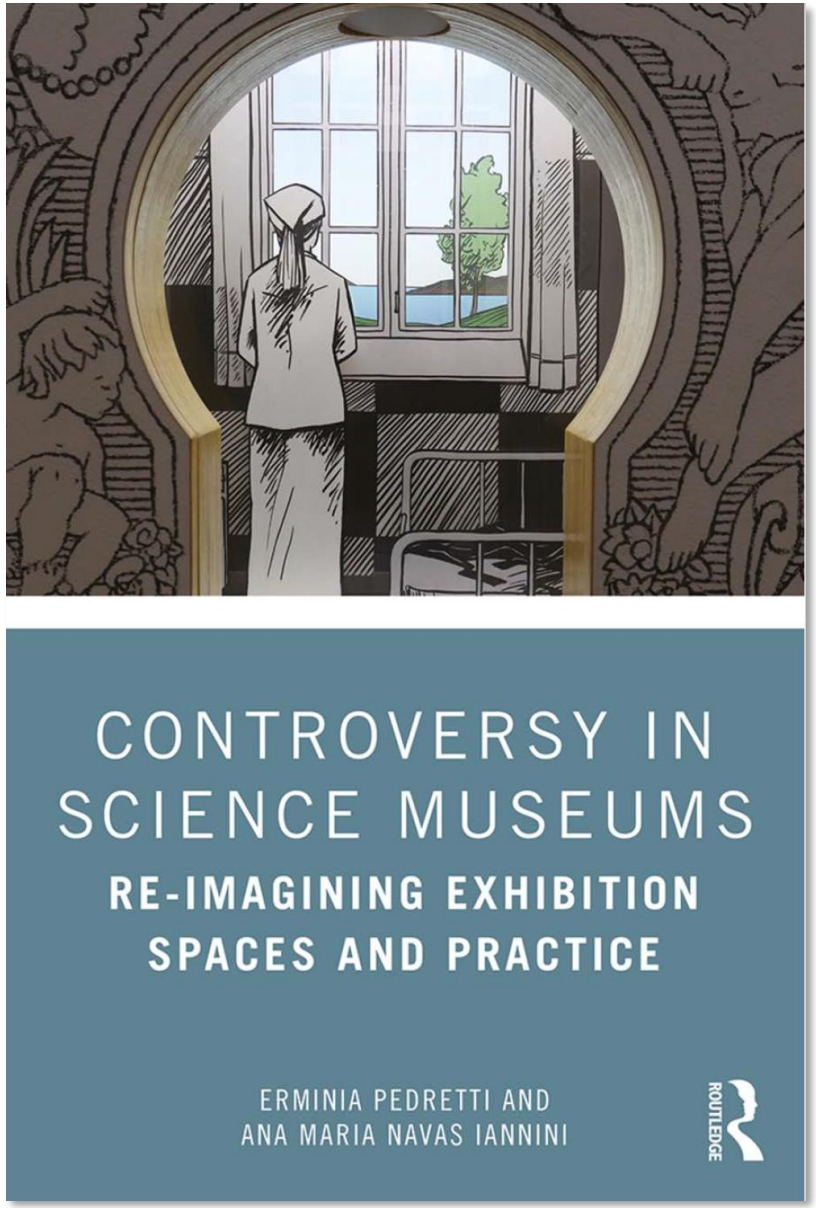
Introduction

Science centres and science museums are located within contemporary society with all its complexity. This puts them in a unique place to engage the public in relevant conversa-

Science museums and science centres are already located in the borderland between science and society, and have gradually been turning towards more participatory and inclusive models of science communication

Empowering citizens

Agential exhibitions promote responsible citizenship, informed decision-making, and action. […] Agency becomes an explicit part of the goals set by the museum staff in the hope that visitors will engage in ways that prompt change in their own lives, family, community, and/or society.

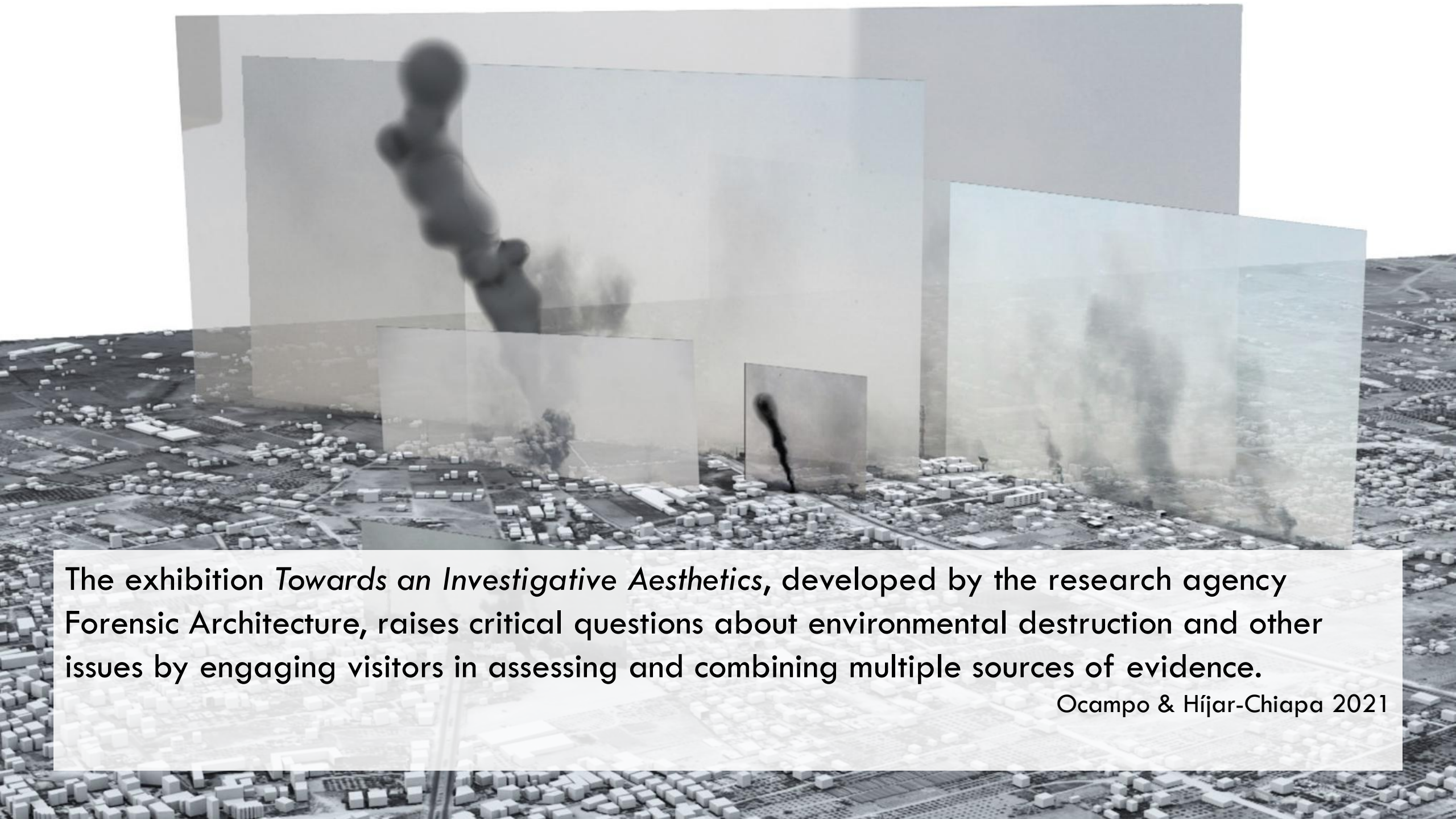


Preventing Youth Pregnancy, displayed at the Catavento museum in São Paulo, Brazil was designed to help young people make responsible choices about sexual practices and to challenge cultural stereotypes. The exhibit treated young visitors as citizens with unique voices worth hearing, using difficult and sensitive themes to support their autonomy and decision-making around sexuality.

Pedretti & Navas Iannini 2020

Heureka Goes Crazy, at the science centre Heureka in Finland, tackles misunderstandings and prejudices about mental health. It gives visitors a real sense of the symptoms of common types of mental illness through a series of immersive and arts-based experiences.

Pedretti & Navas Iannini 2020



The exhibition *Towards an Investigative Aesthetics*, developed by the research agency Forensic Architecture, raises critical questions about environmental destruction and other issues by engaging visitors in assessing and combining multiple sources of evidence.

Ocampo & Híjar-Chiapa 2021

Supporting sense-making

The employment of artistic and sensory methods has the potential to not only improve knowledge communication in the field of sustainability science, but also open up alternative ways for understanding and interpreting the world beyond the purely cognitive analysis and (re-)construction of phenomena

Heinrichs 2018

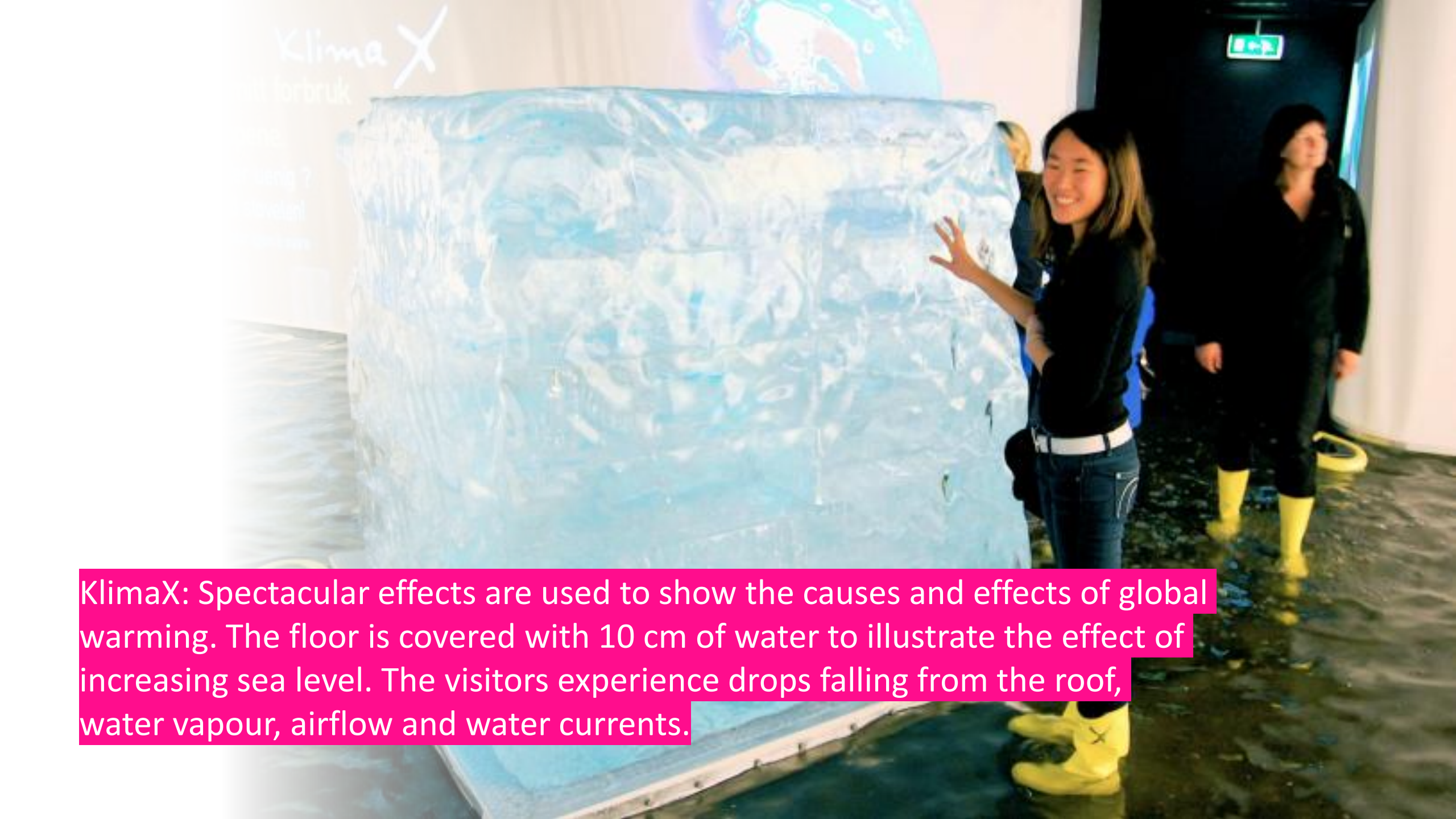

Positioning climate change as a phenomenon to be known primarily cognitively has led to approaches to public engagement that are highly disengaging , as well as ignoring the emotional pain of those who are already concerned or affected
Verlie 2022

Using aesthetic methodologies in science museums is thus about embracing the entanglements and complexity with which wicked sustainability problems come. In this sense, exhibitions and installations become portals for intellectual, emotional, and physical experiences rather than media for the straightforward transfer of information.

Markus Reymann, in Bonvik-Stone, 2023

Pollution Pods: Five domes containing carefully created environments, simulating different atmospheric conditions globally, from a Norwegian island to Beijing and São Paulo

Pinsky & Sommer 2020



KlimaX: Spectacular effects are used to show the causes and effects of global warming. The floor is covered with 10 cm of water to illustrate the effect of increasing sea level. The visitors experience drops falling from the roof, water vapour, airflow and water currents.

These exhibitions don’t present sustainability problems literally or 1:1. Instead, they work as meta-realistic exhibitions that juxtapose real-world fragments to spark imagination and suggest new ideas. By collapsing space and time, they make distant, invisible, and slow-moving sustainability issues tangible. In doing so, they open up ways of knowing and experiencing wicked problems that would otherwise remain inaccessible.

Imagining possible futures

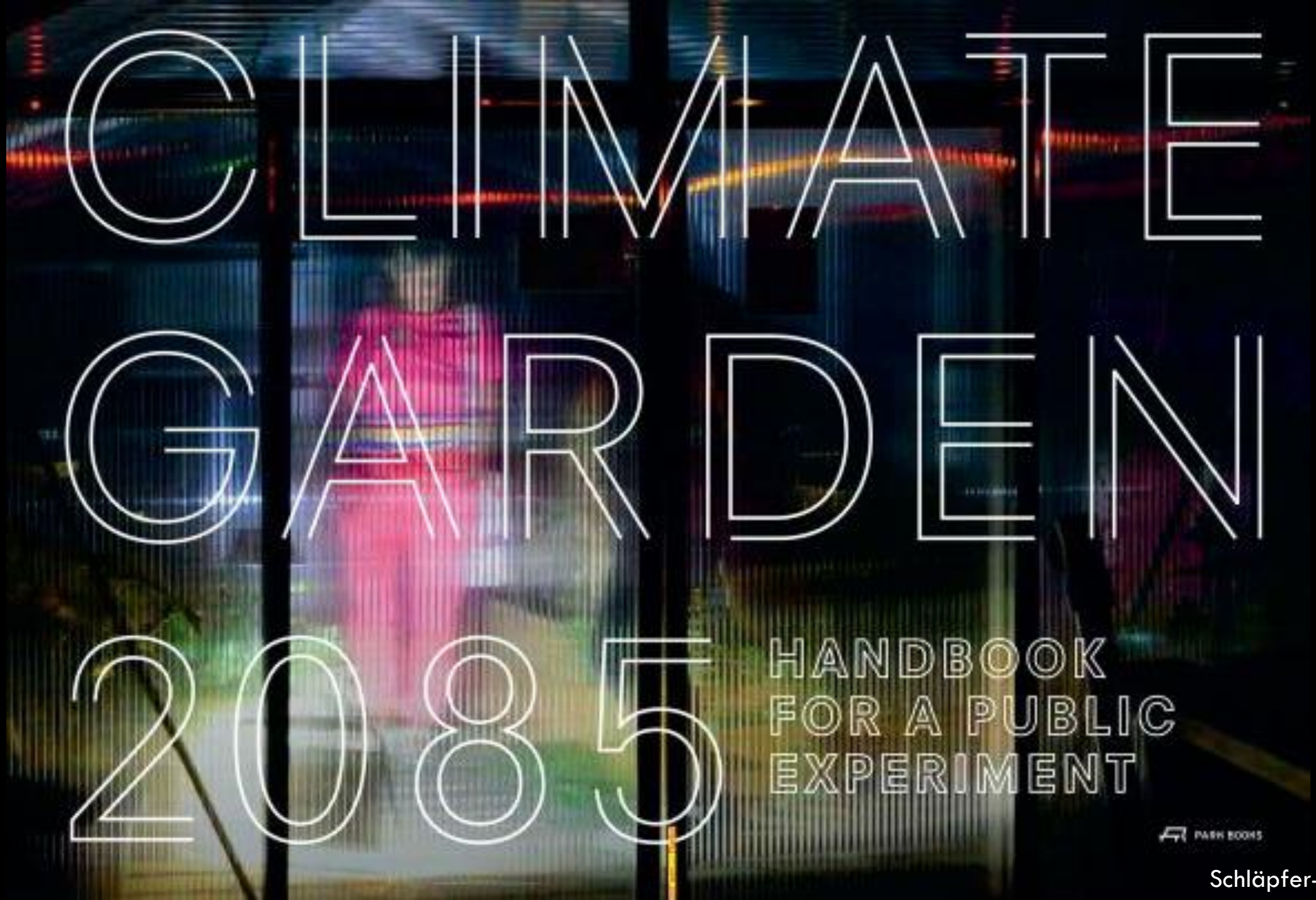
When your fundamental model of neoliberal growth-based economics is pushing you off a cliff, you don't innovate.

Our fundamental internal narrative is so focused on collapse and disaster and the inevitability of that that we exclude the possibility that we could actually be successful.

Author Rob Hopkins

The three girls Aka (in red), Kiiro (in yellow), and Midori (in green) have travelled back in time from three different futures that reflect average global temperature increases of 4.5°C (Aka), 3-3.5°C (Kiiro), and 1.5-2°C (Midori) respectively in the year 2121. The girls are present throughout the exhibition, offering personal narratives of their experiences in relation to a number of everyday themes (transportation in the above image).

Photo: M. Achiam



Schläpfer-Miller 2021

Final remarks

Museums have an important role to play in creating inclusive spaces to engage citizens (and other parties) in discussing, making meaning of, and addressing pressing socio-scientific issues

This requires museums to transition from an ethos of implicit neutrality (science as truth) and a practice of passively sharing knowledge, to one of actively promoting agency, sense-making and imagination

In doing so, museums can become vital infrastructures for collective reflection, dialogue, and action in a rapidly changing world.

Questions for discussion

In your own institution, where do you see opportunities to move from presenting “neutral” knowledge to fostering dialogue, agency, and imagination? What small first step could make that shift possible?

Which socio-scientific issues in your context feel too complex, uncertain, or value-laden for traditional exhibition formats - and how might you design spaces that allow publics to engage with that complexity rather than avoid it?

Want more?

Find the article behind this talk, here:
tinyurl.com/PostNormalMuseums

…or get in touch with me:

achiam@ind.ku.dk

www.linkedin.com/in/marianneachiam/

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