

On the Interplay of Images

Imaginaries and Imagination
in Science Communication

Edited by

ANDREAS METZNER-SZIGETH

ESTRATTO • EXCERPT

Contents • Preface • Abstracts • Authors



Leo S. Olschki
2022

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Tutti i diritti riservati

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PREFACE

The quality of the interplay of images, imaginaries and imagination in processes of science communication is of crucial importance. This is particularly true for joint projects and shared initiatives and with reference to its potential for stimulating, enabling and supporting scientists, professionals and citizens when working together or collaborating with one another, as for instance inspired by the generative communication approach. Hence, publishing the volume *On the Interplay of Images, Imaginaries and Imagination in Science Communication* in the series *Scientia atque Usus* is a fortunate decision.

As editors of the series we would like to express our appreciation and thank all colleagues who contributed to this book. A special thanks goes to Andreas Metzner-Szigeth as the responsible editor of this anthology. We hope this book may receive a great response and promote constructive impacts for both, science and society.

Florence, October 24, 2022

LUCA TOSCHI, ANDREAS METZNER-SZIGETH,
JOSÉ ANTONIO CORDÓN GARCÍA, CLAUDIO BARALDI

ABSTRACTS

ANDREAS METZNER-SZIGETH, *Studying the Role of Visual Imaginary in Science Communication – Introduction to the Volume*

The three parts of this paper are meant to pave the way for understanding the entire publication. This is carried out, in the first part, by introducing guiding questions, delineating the topic and representing ways of accessing the complex intertwined ties connecting science, communication, visuals and imagination. The second part presents the contributions to the book following a mixed strategy of offering appetizers, trying to evoke curiosity on the part of the readers, and, simultaneously, summarizing essential contents, since the purpose of the series of examinations is to prepare the ground for more applied research streams. Generating an outlook by combining components of a resume with considerations about individual scientific interests and societal research demands is the purpose of the third part. The paper closes with outlining four areas of further research about the interplay of images, imaginaries and imagination directed towards: I. Organizational cultures and leadership styles, II. Futures studies and scenario techniques, III. Digital communication and virtual reality, and IV. Sustainability science and transition perspectives.

ANDREAS METZNER-SZIGETH, *Science Matters, But Why? – Clarifying the Nexus with Scientia atque Usus*

Dealing with the question of the connections between the development of science and the tasks of science communication this essay presents reflections about relationships, developments and approaches. The first part explores scientific transformations, introduces the idea of transformative sciences, and discusses the implications of both. How to cope with the sciences' dilemma of being simultaneously part of the solution and of the problem is the focus of the second part. The third part analyses opportunities for redirecting scientific practice. Finally the text examines capacities of generative approaches in their relation to the capacities of the interplay of images, imaginaries and imagination by referring to the example of «particles in love».

ANDREAS METZNER-SZIGETH, *Exploring the Interplay of Images, Imaginaries and Imagination in Science Communication – Basic Considerations*

How can we detect and observe the unfolding dynamics of images, imaginaries, imagination and their interplay in science communication? Which are the most suitable ways to analyse and understand their patterns and movements? Which kind of opportunities do we have to make good use of our insights?

Despite the diversity of topics, dealt with either more interested in theoretical reflections, programmatic considerations or practice-oriented descriptions, all contributions to this book have one thing in common: the intention to put these generative dynamics in the focus of our attention and to elaborate answers to these questions – some more tentative, others more definite.

These approaches are of utmost importance as they identify emerging futures early enough to enhance our abilities and assess the societal consequences of new developments in science and technology. They help us make up our minds about our preferences and choices thereby shaping the ongoing dynamics of innovation according to our values.

GERALD HÜTHER, *The Power of Inner Images – Insights from Neurobiology*

Any living system, no matter if it is an individual cell, a complete organism, a community, or a certain kind of society, is provided with an inner structure and a specifically inner relationship structure of those sub-systems and components constituting the system as a whole. This internal organisational structure is built in the course of the development of the system. Usually, it can be maintained despite disturbances and threats to the inner structure by outside influences. In the human brain, neuronal connectivity patterns are established and shaped by experience-dependent plasticity. At the most complex level, such a pattern in the prefrontal cortex is the biological foundation of individual images of oneself and its embeddedness in the world. With the help of these inner images, a human decides what is essential for him/herself, what to deal with, what to support, and what to focus on. The fact that today these inner imagination images are disregarded as unreal and unimportant highlights how much their power is currently still underestimated. The human brain is much more social and cultural than previously thought. It can neither be understood by its inner structure nor by its way of functioning. It can be understood in isolation and separately from the structuring influences of the social community within which each human has been growing up and living. More than in all other natural-scientific disciplines, the current neurobiological search for insight proves that no clear, 'objective' separation between subject and object is possible. The allegedly objective investigator always shapes the object subjectively, however, he is also the analysed object, a subject using his/her brain in a certain way.

XABIER INSAUSTI, *From Plato's Cave to Digital Communication: Philosophical Reflections about the Role of Imagination*

We humans have a remarkable ability to imagine a reality beyond its immediate presence, to think of new «worlds» through which life can be expanded. Life is infinite, and that is because the imagination makes it possible to break through the immediate horizon, push on, and think further. This ability can deceive us (people); it can lead us in the wrong direction, i.e., it lets us think up horizons that become more unjust and inhumane. In this essay, there will be developed some thoughts about the role that imagination plays in human life. «Utopias» is the name given to the products of imagination. But when utopias «get on the wrong track», dystopias are produced. Today, a new kind of horizon has emerged, a new horizon that will bring together a society that has lost its previous values, does not believe in «humanism», and tries to survive in a world with no apparent reason or «rationality». Digital 'communication' emerged with the power of a substitute capable of attracting young people's attention and has triumphed. The past no longer exists in this world; history has lost its meaning. This has brought new problems, new imbalances, new dangers, and new opportunities. It undoubtedly forces us to sharpen our critical minds to seek a safe ground that can order and organize the new situation if we do not want to succumb. Imagination is more necessary than ever.

MASSIMO BARTOLINI, *The Books of Attention: On Awareness and Imagination in Life, Arts and Sciences*

Supreme attention is a holy virtue. This state of mind can be understood as being perfectly aware of and being fully present in space and time. Mindfulness, as another expression for this state, means being aware of the «here and now» in all its details, even those normally imperceptible to our five common senses. In this text I have «invited» authors who have devoted themselves to both, enhanced awareness as a tool for investigation and the language that manifests, trains and produces it. The relationship between awareness and imagination in art and science, often considered as an excess of awareness, has recently revealed some possible drawbacks. An excess of «fantastic imagination» in any area of life, from news media to politics to social studies, may also contribute to the phenomenon of fake news or other countless mental pathologies of recent times. Capitalist societies instigate an excess of «fantastic imagination» under the designation of liberalism as if to uproot people from their own, original standards, values and perspectives. In this short, and possibly sometimes a little too associative essay, I show examples of artists, scientists and writers, who have pursued the practice of supreme attention in «true imagination» as a means to actually intervene in real and dreamed (visionary) life by simply uniting these two lifeforms using justice as a thread.

LUCA TOSCHI, *Generative Communication Paradigm. Very Simple Prolegomena to Future Design and Implementation*

Planetary humanity is experiencing a system leap encompassing all the structural and superstructural aspects of our reality. We live in a time of complexity, where the traditional relationship between prediction possibilities and design logic and techniques is distorted. What kind of design should we use for complexity? This contribution seeks to find answers to this question, rethinking design as a process that – although defined, accurate, technically structured – is able, in a continuous coming and going from ideas to things, to transform the product into a knowledge tool. We live in an era of inevitable experimentation that is reconstructing the relationship between the imaginary and realization of what is imagined: the project becomes product, the product becomes project. Digital is at the same time the effect and cause of this radical transformation, but we lack a digital culture capable of supporting experimentation unbound to predefined objectives, which supports the value of exploration, the coexistence of uniqueness and multiplicity, that fosters variety and redundancy, divergence, conflict. To free the human being from the progressive mechanical automation that big data society is imposing, digital must become a tool. Traditional transmissive, hierarchical, emulative, mechanistic communication denies the many resources offered by a complex reality, and thus, a new communicative paradigm is urgent: we call it «Generative Communication».

ANDREAS BÖHN, *Artificial Intelligence in German Literature of the Last Decade*

The text highlights the relevance of fictional representations of Artificial Intelligence (AI) in contemporary German literature and their connections to the public discourses on technological innovations. As the industry and various aspects of everyday living are increasingly informatized and automatized, reality seems to approach established anticipations of AI in the arts, media and literature. The influence of culturally and historically preformed conceptions and images becomes apparent in Frank Schätzing's latest thriller *Die Tyrannei des Schmetterlings* (*The Tyranny of the Butterfly*), Ursula Poznanski's young adult fiction *Erebos 2*, and Emma Braslawsky's novel *Die Nacht war bleich, die Lichter blinkten* (*The Night was Pale, the Lights were Flashing*). It also becomes apparent how these literary texts interact with actual public debates.

SELENA SAVIĆ, *Pixels and Bandwidth: On Imaginaries of Travel in Data*

The imaginary of travelling in data traces interdisciplinary concerns for technical artefacts. Focusing on data collection on radio signals gathered by a community of radio amateurs and enthusiasts, informational tools – «data observatories» – render signals commensurable through their different visual representations. What can pixel distribution in a sound spectrogram tell us about a radio signal? Following Haraway's insistence on the importance and persistence of

vision as an embodied gaze enabling a new doctrine of objectivity, this study proceeds by extracting and organizing radio signal qualities using a machine-learning algorithm to expose them again to the visual faculty of subjective observers. Vision and travel constitute methodical tools to unfold disciplinary concerns starting from specific data in a way that favours interactional expertise.

TZUNG-WEN CHEN, *Seeing and Believing: How Moore's Law Drives Semiconductor Innovations*

Moore's law, which sets the pace of technological evolution in the semiconductor industry, has been prophesied to die. How this law still keeps itself alive to drive semiconductor innovations is so miraculous that it can hardly be explained by social constructivism. In this chapter, a visual approach is proposed to probe the magic function of Moore's law in the case of FinFET technology, a 3D structural innovation in the 21st century. It is argued that time-dependent Moore's Law can combine two different versions of interpretation on *eidōs*: 'form and propensity' and 'concretization of imagination' to transform technological imaginations into periodically innovative practices. The visual approach is to analyze drawings and figures in patents. The first FinFET device was patented in the early 2000s. In the patent, the device structure is depicted with lines only, without shade or colour. A simple image of the original structure serves as a primitive form that stimulates further imagination on 3D device design. Following this patent, more innovations are produced by East Asian semiconductor manufacturers such as TSMC and Samsung. These companies in the competition have their innovative practices, which are outcomes of their dispositions, as seen in their patents with more complicated and artful drawings. The dispositions also contribute to visual intelligence on a collective level. The periodical innovations reveal competitive nature among the dispositions, which has an imminent propensity synchronized to the rhythm of Moore's Law. In short, Moore's Law has its visual signification in the slope of the curve and the scale of device numbers that is an institutional and structural imaginary of semiconductor technology.

THOMAS HUNDT, *Unrealistification – Virtual Reality as a Cultural Technology*

Reality surrounds us humans and seems normal to us. Unreality, however, fascinates us, and always has. Whenever we think of something, it becomes somehow real. As soon as we write it down, draw it or model it on the computer, it becomes even closer to reality. Many of our cultural techniques explicitly do not serve to record facts, but to try out something previously undiscovered. Digital tools, especially 3D real-time engines such as «Unreal» or «Unity», are now so advanced and highly available that they can be understood as cultural techniques. With a pencil you can note down facts, but also sketch a fantastic world. With a hammer you can drive in a nail or create a sculpture. As an architect and designer, I have been using 3D software for more than 25 years, especially for the playful

and intuitive development of spaces and experiences. The paper offers a reflection on the general topic based on my work.

LETIZIA BOLLINI, *Images to Think and Tell – Visual Language in Scientific Discourse*

Whether mental, oneiric, diagrammatic, symbolic, sketched, photographic, (hyper)realistic or abstract, images play a fundamental role in the processes of imagination, conception, observation, and communication of thoughts, concepts, and phenomena. They are powerful means for documenting, describing, and explaining visible events as well as tools for translating hypotheses and conceptualisations in order to verify them or share them with others, or for describing ideas and phenomena in the non-visible sphere through graphic language. Indeed, within the scientific discourse and its method, images have a crucial function in the processes of thought, discovery and understanding. If we extend the scope of scientific discourse not only to the production of knowledge, but also to its dissemination, «graphicacy» – the ability to encode and decode information according to visual language – becomes a critical skill for accessing and participating in a debate that has become increasingly public and widespread. The essay traces the history of some of the paradigmatic discoveries and theories in which scientists have used images as a medium for research, understanding and dissemination.

EMILIANO GUARALDO, *The Anthropocene and the Aesthetics of Planetary Abstraction*

The notion of the Anthropocene presupposed since its initial formulations the possibility to represent planetary anthropogenic environmental change through methods of data collection and imaging techniques of satellite reconnaissance, remote sensing and data mining, computer simulations and modelling. The popularization of the Anthropocene paradigm has prompted researchers working within the earth system sciences, climatology, geology, and international scientific bodies to evolve and improve existing forms of visual communication and public outreach initiatives. The reception of the Anthropocene paradigm by visual artists, art institutions, natural history museums, design studios, and various other cultural and aesthetic practices has generated – and is continuing to produce – a large and diverse corpus of arts-based and research-oriented visualizations of climate change. In this chapter, the author will introduce the subject of geo-scientific Anthropocene visualizations and will define a working corpus of the most relevant artistic projects that have expanded or called into question the socio-ecological visualizations originating in the geosciences. In particular, the essay will focus on recent works by American painter Diane Burko (*Seeing Climate Change*, 2021) and by Japanese experimental audio-visual artist Ryoji Ikeda (*Data-Verse*, 2019). While creatively incorporating the technological and data-driven

aesthetics of climate change science, these artists ask us also to reflect on how the ubiquity and pervasiveness of climate data and satellite imagery are effectively re-configuring the way we perceive the planet and the environmental crises today.

VALENTINA MARCHESELLI, *Building Habitable Worlds – Images and Imaginaries in Planetary Science*

This chapter deals with images and imaginaries of outer space. In particular, it focuses on how the concept of «habitability» (i.e. the property of a planet to host life) is characterized, represented and circulated within and without the scientific community. In the first part of the essay, different images and imaginaries of planets as habitable places and the research practices to which they are connected are spelled out. First, the focus is on the so-called «habitable zone», an imaginary disk around the star in which the temperature might allow for liquid water to exist. Then the focus is on the search for «Earth-like planets» orbiting other, not necessarily Sun-like, stars and on the exploration of extreme 'habitats on Earth' and the «weird» forms of life that thrive in them. Lastly, attention is paid at how astrobiologists portray exoplanets as places to be inhabited one day. Circulating a variety of representations provides the astrobiology community with a grey area in which tensions are allowed and can be debated without necessarily being solved. Wondering whether a certain Solar System body or exoplanet is habitable should not be considered a «controversy», as it does not aim to achieve closure. On the contrary, imaginaries of habitability purposefully allow multiplicity. Different types of habitability and different ways of imaging the kinds of worlds that might be found out there confront each other and allow a multiplicity that strengthens – rather than weakens – the social and epistemic configuration of the astrobiology community and the public interest in the search for life elsewhere in the universe. The concept of habitability contributes to building an interdisciplinary community by providing a grey zone that offers the opportunity for different methodologies, interests, and expectations to co-exist.

CHARUDATTA NAVARE, *Challenging the Tyranny of T. rex: A Critical Analysis of Visuals of Prehistoric Life*

Nineteenth-century biologist Ernst Haeckel's tree of life depicted «lower» organisms at the base of the tree and «advanced» organisms progressively higher. The tree illustrates that evolution is a drive towards greater complexity, synonymous with progress. Modern biological thinking that construes evolution as a diversification process is increasingly challenging this view. While modern biology textbooks explicitly state that all extant organisms are equally evolved, I argue that the prior assumptions of hierarchy implicitly shape the visual rhetoric. The particular choices of exemplary organisms from different taxa and periods originate from and reinforce the underlying belief of «primitive» and «advanced» organisms. As Reynolds (2008) has shown, Haeckel's selection of Amoeba as the

representative of protists, which remains popular in textbooks, was partly due to its «simple» appearance. Through a discourse analysis of scientific illustrations, I show that similar motivations might guide prehistoric life's portrayal. I focus on the dinosaurs, which (in a sense arbitrarily) have become one of the prototypical organisms of the past. The rhetorical choices while depicting dinosaurs, such as their fierce expressions, portray the dinosaurs as «dominating» the prehistoric landscape. Other choices make the dinosaurs appear similar to present-day reptiles. The visuals of mammalian ancestors (such as therapsids, who arguably «ruled the earth» before dinosaurs) remain rare. The illustrations depicting early mammals are often shown to cower with fear as dinosaurs «ruled». Recent research has challenged the conventional wisdom of dinosaurs as an impediment to the diversification of mammals. Finally, I consider the implications of the visual rhetoric of evolution and what it suggests about our place on earth.

EMANUEL MATHIAS, *Different Modes of Recognition – A Visual Approach between Evolutionary Anthropology and the Arts*

The artistic research project *On the Margins of the Field* is an aesthetic observation of research in primatology, a field of science that investigates great apes behaviours in their natural environment. What makes a human? Where lie the similarities and differences between humans and primates? These are questions that occupy the researchers in their work. By an artistic observation of the second-order, the researcher's internal and external movements of approach and distance to its research subject are being put into relation to each other. Traces of implicit knowledge of anthropological research are being inquired about based on photography and video recordings from the field. It is being proposed that a new view of the visual artefacts of knowledge and an extended perspective on the observer's relation to its research subject – the primate – opens up. The images are examined for their potential for the «Optical Unconscious». *On the Margins of the Field* uses the artistic resources of image production to comment on the practice of anthropological research. This text discusses the imaginative potential of scientific images through artistic reinterpretation with concrete examples.

STEPHAN SCHMIDT-WULFFEN – ELISABETTA RATTALINO, *Artistic Practices and Scientific Visualization: Challenges of an Interdisciplinary Collaboration*

The pragmatic turn in science clarified the constructive character of scientific exploration: Scientific knowledge is not inherent in reality. It is a social construction. In 1995, Pickering described the research process as a «dance of agency» in which the scientist's intention constantly adapts to a «mangle» of practice. This process depends not only on formula or discourse; it also implies pictures and (mental) images. The research project, of which this paper examines and comments first results, tried to document the possible contribution of art in challenging the construction of such images in scientific research. The paper will present

selected visual and theoretical results of an interdisciplinary research project developed within an academic context. Contributing also to the emerging field of image studies at the intersection of art and sciences, this project involved a team of scientists, a designer, an artist and art and media theorists, and it aimed at assessing the diverse role visual arts can play in affecting scientists' relationship with their visual production. Collaborations between artists, designers and scientists in institutional research contexts have acquired increasing consideration since the 1990s. Despite the over 60 years and the highly different circumstances that separate the first experiences from more recent initiatives, these experiments still strive to move beyond the humanity-science disciplinary gap indicated by English physical chemist Charles Pierce Snow in 1959, bringing alternative research cultures and pieces of knowledge into all fields of human enquiry and moving towards post-disciplinary approaches. Discussing the result of the research project, this contribution will assess visual arts' limits and possibilities in proposing image-making practices for the communication of scientific knowledge.

WALTRAUD KOFLER ENGL – ALEXANDRA BUDABIN – GAIA PICCAROLO, *Cultural Heritage Imaginaries of Conflict in the Mountains Enabled by Digital Apps*

This chapter considers the communication processes between science and the public by examining the use of digital apps for cultural heritage. To illustrate the interplay between images, imaginaries, and imagination in science communication, the focus of the chapter is on dynamics particular to communicating cultural heritage related to conflict in the mountains. It presents some of the debates on using digital apps that consider the aesthetic, practical, and narrative aspects of using virtual images (including maps and 3D renderings), oral histories, and interactive elements to enrich the experience of visiting a physical site of cultural heritage. It explores how digital apps offer new possibilities for mediating our relationship to cultural heritage in the landscape. However, we also delineate how digital apps may limit our understanding, fuel «disaster tourism» and pose risks to the fragile structures of a former battleground in the high alps. The chapter offers ideas for resolving various tensions around protecting the landscape and navigating contentious themes in this cultural heritage. It applies lessons to the case study of the *Written in the Landscape* project that will produce a digital app drawing on archaeological, sociological, and historical materials to present new knowledge around World War I conflict in the Sesto Dolomites.

INGRID KOFLER, *Heimat as Social Imagination or as Social Imaginary? – South Tyrol and its Linguistic Lifeworlds*

«Heimat» does not to the German word of 'home' or 'homeland' but to a much more complex concept. Heimat has both a subjective meaning and a social imaginary. The concept of Heimat is experiencing a new revival. In recent years, it has been increasingly perceived as an opposition to change and modernization.

Thus, the concept of Heimat experiences multiple definitions and perceptions, demonstrating its potential to highlight controversy and provide keys to understanding social phenomena. For the German-speaking minority of the Autonomous Province of Bozen-Bolzano, the concept refers to a particular meaning and is part of a collective imaginary supported by cultural productions. In this case, Heimat as social imaginary holds together the community in a binary lifeworld divided by linguistic groups.

ILARIA RICCONI, *Images and Experience – Singularity and Collective Narratives in the Interplay of Images, Imaginaries and Imagination*

An aware relationship between personal experience and the wider society is part of what C. W. Mills defines as «the sociological imagination». It is, indeed, a sort of social creativity that connects experience to the social structure of a society, as the capacity to transform personal troubles in social issues is due to social imagination. In this perspective, the generative dynamics unfolding within the interplay of images, imaginaries and imagination can be recaptured in the meanings enacted by individuals by means of experience and by means of social narratives. In this paper, the aim will be to consider how a visual society, as the contemporary one, can comprehend and leave space for free-thinking and social imagination connected to a personal level of experiences. In other words, how can this pre-thought area, as the realm of creativity that leads to connecting the experience to sense-making in the form of images, be preserved from atrophy in a society that relentlessly produces images? The insights suggested by arts in elaborating and combining social experience can be somehow considered in opposition to the production of imagination and images on an industrial scale. There is a symbolic power of images that contributes both to organize experience and to build up meanings in the human imagination. Such symbolic power is highly present in theatre and poetry as they can create proper images from what they express. This paper will make use of the insights supplied by the arts to define or track the generative dynamics enacted to recapture the human capacity of creating images and meanings from within.

ROLAND BENEDIKTER, *What is Intercommunicative Techno-Democracy? - Transforming the Social Imaginary by Futures Literacy*

Imagining the upcoming techno-democracy of 2030 means working on the present by means of a broadly organized creative dialogue on the future with the goal of transforming social and technological disruptions into progress for society. The methodological approach for using individual and social imaginaries to create a functioning techno-democracy built around tools of accessible, participatory and inclusive intercommunication is «Futures Literacy» (FL), as developed by the UNESCO in cooperation with other global bodies and the applied social sciences. FL means empowering people to become literate to use the future for

the present. FL uses imaginaries, including images of the future existing in the present, to surface, screen and anticipate a variety of competing (and often mutually complementary) visions of the future in order to socially interrelate them by a scientifically organized dialogue. The goal is to increase individual and social preparedness, foster mental resilience and broaden the spectrum of options available in the present. In so doing and in including «Tech Literacy», Futures Literacy by itself already is a tool of intercommunicative techno-democracy.

JOE RAVETZ, *Visual Imagineering: Graphic Mind-games For the Emerging Collective Climatic Intelligence*

On the frontiers between multiple knowledges – scientific, technical, cultural, archetypical, economic, entrepreneurial and so on – images, imaginaries and imagination each have essential roles to play in a deeper and wider «collective intelligence». Here we introduce a fourth dynamic, one of «imagineering». Just as «engineering» is about the process and skills for creating physical constructions, imagineering is about the process and skills for enabling «imaginaries and imaginations». This chapter is a demonstration of imagineering in practice, using simple real-time graphic storylines as the point of investigation. It starts with the theme of «tipping points» (from a trans-disciplinary workshop), where systems changes are not only material, but cognitive in the minds of multiple stakeholders. This opens a door to the «mind-games» which explore the roles and strategies of these stakeholders through the Covid-19 pandemic, visualized as chess, cards and other familiar games. Thirdly there are topical applications with the current agenda of climate change, disruptive events such as wars, and the possibility of a «collective climatic intelligence». Some conclusions emerge: both for the practical process of «visual foresight», and for the role of visual thinking in mapping collective intelligence pathways, «from smart to wise».

CRISTINA ORSATTI, *The Use of Visual Tools in the Territorial Community Plan of Valsugana and Bersntol – An Anthropological Approach to Sustainable Development and Planning*

Planning is traditionally based on quantitative socio-economic studies, lacking socio-economic-cultural depth and an explorative dimension. In 2012, an interdisciplinary team designed innovative tools for territorial planning, which linked spatial environmental and socio-economic strategic planning to community knowledge of the place, needs and development visions. It aimed to integrate local and expert knowledge in a strategic landscape development plan. This paper discusses the role of visual tools in interdisciplinary and anthropological fieldwork to support evidence-based analyses, planning and development. It shows how maps and questions could facilitate fieldwork and become means to enhance a collective and shared vision of a sustainable future in the area – when integrated with a general interdisciplinary framework. The maps presented have been

designed and tailored to the area of Valsugana and Bersntol, collecting data in fieldwork aimed at shaping the PTC – the Community Valley Territorial Plan 2010-2012 in Trentino. In this plan, for the first time, an anthropological and interdisciplinary approach to evidence-based planning was used to explore the area's weaknesses, strengths, and potentials and the state and future of its landscape. During fieldwork, visual tools were used to interview local informants, experts, and administrators around specific themes. They were instrumental and innovative in collecting objective data and subjective perceptions. They provided information on the territory's assets, economy, spatial organisation, and ways to go forward. Ortho photos proved helpful, easy to use and immediate in this context of data collection to generate communication amongst stakeholders, and experts, prompting strategic thinking and subsequent intervention. For this reason, an experimental, anthropological, interdisciplinary, explorative and applied research approach could offer a replication model.

BERENICE GOLDING – ELIZABETH F. CALDWELL – SARAH FALCUS, *Health Communication through Picturebooks: Perspectives from Adult Family Members and Health Professionals on Children's Books about Dementia*

Many children know someone with dementia and experience the effects of the condition upon family life, and this has led to an increased demand for resources to support and educate children about dementia, including a growing number of picturebooks. Picturebooks about illnesses such as dementia are likely to be examined, purchased and read by/with an adult, often a child's parent or carer. This study, therefore, explores the readerly responses of adults who may buy, recommend and read these books with children. Using a focus group methodology, we explore the reactions of adult carers of people living with dementia and healthcare professionals to a range of picturebooks about dementia. The focus group discussions showed that both carers and health professionals supported the books' use of mechanistic metaphors for explaining dementia to children, but they also recognised the lack of diversity found in the images of people living with dementia. Finally, the participants felt strongly that the emotional effect on the adult reading the picturebook was crucial to the reading experience with the child and indeed to the choice or use of the books at all. Our findings demonstrate the importance of images and emotions in communicating health information to children through picturebooks.

EUGENIO PANDOLFINI – LISA CAPITINI – ILARIA MARCHIONNE – MARCO SBARDELLA – VIOLA DAVINI, *Generative Communication Paradig to Study the Imaginary about Childbirth – How Science Communication can Promote Health Literacy*

The infosphere is transforming our lives: the increasing spread of disinformation creates many difficulties in recognizing the truthfulness and authorita-

tiveness of information, photos, and images. In most cases, we deal with the absence of a literacy base on specific topics and the lack of tools and skills that help people orient themselves in increasingly intricate mass media communication. Such information contributes substantially to constructing imaginaries that often do not correspond to reality. Imaginaries can lead to the adoption of wrong and potentially harmful behaviours, especially in terms of health. The research group works to re-establish a constant and prolific dialogue among doctors, researchers, medical staff and patients for a healthy society. In this perspective, this paper introduces the project “Who is afraid of Childbirth”, realized in collaboration with Hospital-University Careggi in Florence, which aim is to study what is pregnant women’s perception about childbirth and how it is influenced by the media and the social relations (partners and families) in order to define more effective communication strategies and to enhance the level of health literacy.

JOOST VAN LOON, *Imaginaries of Crisis Communication*

Science is no longer what we were taught it used to be. Whilst – at least since humans have started writing history – planet earth is facing unprecedented challenges that may result at the end of the world-as-we-know-it, there is simultaneously a growing and even apocalyptic sense of our growing impotence to turn the tide. Franco Berardi’s concept of impotence is indeed a highly adept tool for understanding how crises are communicated and perceived today. In this contribution, I will analyse one meme that can function as a useful example to expose the impotence of crisis communication and the banality of our apocalyptic predicament that this engenders. The «ironic» over coding of the meme, which signals a series of crises (Covid, economic recession, climate change) in the form of three sequential tidal waves, is both an affirmation of a critique of our lack of concern for the bigger picture as well as a withdrawal of commitment, exposing the nihilistic core of impotence. I will contextualise this meme with a reflection on a «Risk Society 2.0», which is characterised by an implosion of epistemic practices and a corresponding abnegation of responsibilities.

BRIAN RAPPERT, *Believing and Seeing on the Moon: The Closure and Continuation of Controversy*

By way of understanding the generative dynamics between images, imaginaries and imagination, this chapter examines one case: the contestations about whether the photographic and visual evidence for the US manned Apollo lunar landings of the 1960s and 1970s were faked. More specifically, it considers how those partaking in disputes have marshalled a role for imagination in interpreting the photographic and video images. Against the longstanding doubt voiced about the status of the images, this chapter assessing how notions of imagination are mobilized as well as their consequences for whether it is possible and who is able to assess the evidential status of images. As elaborated, imagination is marshalled

as a resource in varied attempts to both close and resist closure of meaning making by those across a range of positions.

ANDREAS METZNER-SZIGETH, *How Prophecies Become Reality – Exploring the Interplay of Techno-Futures, Science Fiction and Utopian Thinking*

The paper examines the role of literary, artistic and media utopias within societal discourses concerning the development of technology. It specifically addresses the interaction between the performance of these three components of societal discourses with the elaboration of scientific approaches toward the future. Focusing on the genre of science fiction, it shows that the design of negative (.dys'topian) and positive (.eu'topian) scenarios in novels, art, movies does not only represent a valid examination of futures but has a significant impact on its form. Taking up movements and moods within society, they represent «soft» factors that – in their function as driving forces – are as effective and consequential as 'hard' factors. Thus, studying the future making potential of «soft» factors offers, complementary insights, that an analysis of the 'hard' rational-scientific, political and economic factors cannot provide. Literary, artistic, and media utopias enter a complex interaction with science in general and futures research in particular (and equally well with technology assessment, science and technology studies and similar interdisciplinary future-oriented academic endeavours). Against this background, it becomes evident that literary approaches toward the future unleash important (indirect, mediating) impacts on the processes shaping technical developments. Furthermore, they seem to exert a decisive influence on the social acceptance of far-reaching technical developments (like genetic engineering or artificial intelligence) and the framing of schemes for public funding of science (like the Horizon 2020 program of the European Union). These very factors, acceptance and framing, are of utmost importance for aligning and shaping actual innovation pathways. We can conclude that the stimulant power of imaginative futures and their capacity to alter realities is of utmost importance.

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the University of Brawijaya, Indonesia. He has now set up the Collaboratorium ('Laboratory for Collective Intelligence'), working at the frontiers of cognitive systems development, aiming to map and design pathways in urban economic and political systems, 'from smart to wise'.

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Her research interests centre around health and wellbeing, including black, Asian and ethnic minority communities, equality, diversity, inclusion, and human rights.

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Webpage: [https://www.research.lancs.ac.uk/portal/en/people/elizabeth-caldwell\(8b600377-7f5a-4946-8705-e9a0aa1c7f9\).html](https://www.research.lancs.ac.uk/portal/en/people/elizabeth-caldwell(8b600377-7f5a-4946-8705-e9a0aa1c7f9).html)

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pects. She is also interested in automation processes and how artistic and visual representations can generate new imaginaries, enhance people's creative-design qualities, or induce specific behaviours.

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He studied communication sciences and received his PhD in Sustainable Management of Agricultural and Forestry Resources in 2015 with a thesis about the role of new technologies in territorial marketing strategies. He designs and develops research projects and interventions related to sustainable behavior, agriculture and rural development, healthcare and well-being, international cooperation, governance and participation, and mobility. His current research commitment is the study and analysis of sustainable communication, derived from the application of the generative paradigm of communication to the field of sustainability, individual and collective well-being and functional to overcome the so-called 'Paradox of Sustainability'. He is author and member of the editorial staff of the journal 'I Quaderni di sAu'.

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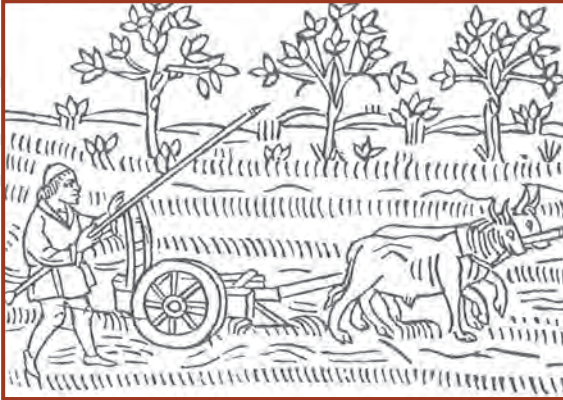
BRIAN RAPPERT

Full Professor of Science, Technology and Public Affairs at the University of Exeter, UK. At the time of writing this volume he was the Head of the Department of Sociology, Philosophy and Anthropology. His long-term interest has been the examination of the strategic management of information, particularly in relation to armed conflict. His books include *Controlling the Weapons of War: Politics, Persuasion, and the Prohibition of Inhumanity*; *Biotechnology, Security and the Search for Limits*; and *Education and Ethics in the Life Science*. More recently he has been interested in the social, ethical, and political issues associated with researching and writing about secrets, as in his books *Experimental Secrets* (2009), *How to Look Good in a War* (2012) and *Dis-eases of Secrecy* (with Chandre Gould 2017). His most recent line of research examines the relation between revelation and concealment through undertaking an autoethnographic study of learning to perform as an entertainment magician.

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Scientia

1. PANDOLFINI, E., *Il paesaggio nascosto. Quale comunicazione nei luoghi della complessità*. 2019, x-294 pp.
2. BARALDI, C., *I sistemi della comunicazione*. 2020, x-264 pp.
3. *On the Interplay of Images. Imaginaries and Imagination in Science Communication*. Edited by Andreas Metzner-Szigeth. 2022, x-440 pp. con 44 figg. n.t. e 16 tavv. a colori f.t.



The dynamics of images, imaginaries and imagination play a crucial role – in academic as well as in public discourses! What kind of essential relations exist between different expressive forms and patterns of thought? How can we understand the principles determining the ways in which their dynamics take effect – in the practice of scientists and engineers, and at their interfaces with politics, economy, culture and the

public? Which options do we have to make good use of our insights?

Despite of the diversity of topics – treated with either more interest in theoretical reflections, programmatic considerations or practice-oriented descriptions – all contributions to this volume share a common interest: to raise our awareness and understanding of the generative capacities of these processes.

Exploring this prolific interplay is of utmost importance for expanding our ability to identify emerging opportunities, to create future perspectives, and to assess the societal consequences of scientific and technological developments. This expansion is indispensable if we really want to be clear about our preferences whilst shaping the ongoing stream of inventions and innovations according to our values.