

Thursday, 19 September 2024

Locations: Große Scharrnstraße GS, Collegium Polonicum CP

09:00-12:30	Summer School (last day) Location: Große Scharrnstraße (GS 105)
10:30-12:30	Registration Location: Gräfin-Dönhoff Foyer (GD Foyer)
12:30-13:30	Lunch Location: Gräfin-Dönhoff canteen (GD Mensa)
13:30-16:00	City tour, field/boat trips
15:00-17:00	Registration Location: Collegium Polonicum (CP Foyer)
17:00-17:15	Welcome and introduction Location: Auditorium Maximum Collegium Polonicum (CP Aula)
17:15-18:45	Round Table: “Co-Transformations in Central and Eastern Europe in Past and Present” (Passoth, Bareikytė, Jajeśniak-Quast, Korablyova, Worschech) Location: Auditorium Maximum Collegium Polonicum (CP Aula)
19:00-21:00	Welcome reception Location: Collegium Polonicum (CP Foyer)

Friday, 20 September 2024

Location: Gräfin-Dönhoff (GD)

	GD Hs3	GD Hs8	GD 102	GD 202	GD 203	GD 204
09:00-10:30	1.1: “Towards sustainability of global resources, fair trade and global justice?” (Alexakis/Fotopoulos /Arapostathis, Veraart/Kip/Van den Borre/Bouwens, Heymann)	1.2: “Datafying the environment. Datafying the oceans” (Ljungberg, Camprubi/Lima, Cirac-Claveras, Höhler, Isern, Meyer)	1.3: “Transitions and Transformations in Energy History. Turning Points in Energy History” (Melsted, Fischer-Kowalski, Nygaard, Kupper, Buns, Hasenöhr)	1.4: “A history of Artificial Intelligence” (Tympas, tba, tba, tba, tba)	1.5: “Unpacking Sustainability and Resilience” (Moss,Emanuel, Hommels, Masabo, Petrova, Van der Straeten)	1.6: Digitalization: (Kopeć, Papanastasiou/Raptis/Vlantonis, Schafer, Schmitt/Settele)

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10:30-11:00	Coffee break Location: Gräfin-Dönhoff (GD Aula)					
11:00-12:30	2.1: „Towards sustainability of global resources, fair trade and global justice?“ (Ihediwa, Kochetkova, Janáč)	2.2: “Datafying the environment. Data and resources” (Cirac-Claveras, Álvarez, Gorostiza, Ljungberg, Hanifi, Milford)	2.3: “Transitions and Transformations in Energy History. The Making of Natural and Biological Gas” (Åberg, Kuijt, Groß, Marrec, de Chirico)	2.4: Transport (Burchardt, Leipert, Olawale/Saibu, Siegrist)	2.5: „Decline, Change and Ascent” (Krebs, Häberle, Konsbruck, Neuscheler, Arendt)	2.6: Food and Health (Stoilova, Karantzavelou, Lallier, Chatzimichali/Vlantonis)
12:30-13:30	Lunch break Location: Gräfin-Dönhoff canteen (GD Mensa)					
13:30-15:00	3.1: „Towards sustainability of global resources” (Lajus, Erazo Acosta/Arteaga, Kechrimparis/Kazantzaz/Tympas)	3.2: “Datafying the environment. Data and governance” (Höhler, Gray, Groll, Leclerc, Panoutsopoulos, Thiel)	3.3: “Transitions and Transformations in Energy History. Transformations of Petrocultures” (Meyer, Åberg, Melsted, Karampatsos)	3.4: „Climates of Waste” (Agarwal, Dhawan, Fazzi, Lundsteen, Müller, Hameeteman)	3.5: Environment (Đurčo, Perga, Perpinya, Klüppelberg)	3.6: “Enlightening transformations through histories of technology” (Weber, Priebe, Van de Voort, Driesse, de Hoop)
15:00-15:30	Coffee break Location: Gräfin-Dönhoff (GD Aula)					
15:30-17:00	4.1: Industrialization (Dekker, Kefalas, Pozzi, Sanvitale)	4.2: “Maintenance and Repair Studies” (Drengk, Meiske, Krebs, Pulas)	4.3: “Transitions and Transformations in Energy History. Energy Infrastructures” (Scoppola, Kazantzaz/Vartziotis/Tympas, Meyer, Kupper, Hasenöhrle)	4.4: Management of water, projects, climate and injuries (Arapostathis/Fotopoulos/Lagouvardos/Karantzavelou, Leimbach, Loureiro, Okhotnikova)	4.5: ICT (Ambrosiani, Cavcic, Noguera, Wróbel)	4.6: “Enlightening transformations through histories of technology” (Moss, Kalmbach/Frysztacka)
17:15-17:45	Open meeting of the Management Committee of Tensions of Europe Location: GD 102					

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Saturday, 21 September 2024

Location: Gräfin-Dönhoff (GD), Logensaal (LH)

	GD Hs3	GD Hs8	GD 102	GD 202	GD 203	GD 204
09:00-10:30	5.1: “Pylos” (Jajeśniak-Quast, Lafazani, Passoth, Tympas)	5.2: “Concern for sustainable development” (Idziak, Kamosiński, Bieniek-Majka, Polcyn, Stępień)	5.3: “Regulating Transport” (Franke, Damm, Werchohlad)	5.4: “Failures of economic integration” (Nygaard, Mørkved, Aven, Johansson, Sahrakorpi)	5.5: “Peat-Use in Europe” (Sparenberg, Lempinen, Toomey)	5.6: Language and Media (Bassett, Höfer, Stoneman, Swietlik)
10:30-11:00	Coffee break Location: Gräfin-Dönhoff (GD Aula)					
11:00-12:30	6.1: “Military Technologies” (Johnston, Stránský, Nigrin)	6.2: “Urban Infrastructure” (Zimmer, Arndt, Hansen, Salm)	6.3: “New Perspectives on Nuclear Culture” (Nielsen, Kramer, Ingvarsdóttir, Götter, Kalmbach)	6.4: “Maintenance and Repair” (Enne, Evens Meiske, Russell, Weber, Young)	6.5: “Sustainability’s ‘Other’” (Akallah, Bagde, Greenwood, Jehlička, Van der Straeten, Van der Vleuten)	6.6: Waterways and Railways (Aven/Nygaard, Zivkovic, Gärdebo/Matala, Musekamp)
12:30-13:30	Lunch break Location: Gräfin-Dönhoff canteen (GD Mensa)					
13:30-15:30	7.1: “Lightning talks” (Fickers, Jajeśniak-Quast, Krebs, Laborie, Sanvitale, Griset, Schafer, Tympas, Van der Vleuten, Wormbs)	7.2: “A multivectorial Driver of Change” (Elli, Lehtonen, Orsini, Podsadowski, Krige, Burigana)	7.3: “Coal in Interwar Europe” (Högselius/Musso/Piahanau, Inal, Piahanau, Henriques, Łazor)			
15:30-16:00	Coffee break Location: Gräfin-Dönhoff (GD Aula)					
16:00-17:00	Keynote: Helmut Trischler: Writing Transformative Envirotech History in the Anthropocene: Provocations and Opportunities Location: Logensaal (LH)					
18:30-24:00	Conference dinner Location: Gräfin-Dönhoff canteen (GD Mensa)					

Thursday, 19 September 2024

17:00-17:15

Welcome notes: Viadrina president Eduard Mühle, conference organizers Dagmara Jajeśniak-Quast/Jan-Hendrik Passoth

Location: Auditorium Maximum Collegium Polonicum (AM CP)

17:15-18:45

Round Table: “Co-Transformations in Central and Eastern Europe in Past and Present”

Migle Bareikytė, Dagmara Jajeśniak-Quast, Valeria Korablyova, Susann Worschech; Jan-Hendrik Passoth (moderation)

Location: Auditorium Maximum Collegium Polonicum (AM CP)

19:00-21:00

Welcome reception

Location: Collegium Polonicum (CP Aula)

Friday, 20 September 2024

Location: Gräfin-Dönhoff (GD)

09:00-10:30

1.1 Towards sustainability of global resources, fair trade and global justice? Experiences, challenges and narratives of transformation (I)

Location: GD Hs3

Climate change, rising resource competition and global inequality pose tremendous challenges to contemporary societies around the globe and urgently require fundamental processes of transformation to sustainable practices and global justice. Proxy and local wars as well as numerous political and economic tensions make modern development even more risky and complicated. These transformations require significant technological, institutional and cultural innovations and the creation of societal acceptance to such innovations. Historical research contributes valuable knowledge about the complexities, conflicts and impediments of such transformations as well as experiences of successful cases and best practices.

This panel will offer historical research about cases and examples in all relevant domains around the globe. Topics of interest comprise historical cases of technology and transformation in resource extraction, distribution, availability and consumption, for example in the development and use of natural resources, energy transition, mobility turnaround, shifts in production, changes in consumption etc. The panel has goal to enable comparative discussion of local and global narratives about this transformation and the versatile roles of technology in it.

Organizers: Matthias Heymann, Elena Kochetkova

"Seeds, Breeds and the multiple faces of Productivism in Greek Agriculture, 1920-2000" (Sotiris Alexakis, Stathis Arapostathis, Yannis Fotopoulos)

This presentation explores the process of marginalisation that traditional seeds and breeds underwent in Greek agriculture from 1920 to 2000. This analysis focuses on the sociotechnical systems associated with the cultivation of wheat and tomatoes (edible and industrial purposes), as well as the sociotechnical system of poultry production in animal husbandry. Our research paper traces 80 years of transformations in the Greek agriculture through the lenses of biological resources aiming to locate local modes of production to global networks of resources. We argue that the introduction of the new and enhanced plant and animal varieties into the agrifood system

represents tangible manifestations and material enactments of visions and imaginaries of “productivity”, global “competitiveness” and “modernization” as well as visions for new “quality” standards. From the 1920s to the 1990s, regime actors envisioned an economically feasible intensified production. However, in the 1990s, concerns regarding the safety and environment of food products emerged, which subsequently prompted a shift towards a new governance model of agriculture based on intensified sustainability. The new improved plant varieties and animal breeds shaped the core of the material conditions for the emergence and spread of an intensified sustainability pattern that exist in the Greek agrifood sector since the late 1980s. Corporate networks of global circulation and the commodification of biological material produced the newly improved seeds and breeds, which served as technologies of a political economy linked to the pursuit of competitive industrialization, the overexploitation of natural resources, and the emphasis on chemicalizing production. The paper is looking at: a. the politics of the introduction of improved plant and animal varieties and the dominance of foreign biological resources, b. the shaping of path-dependencies due to the lock-ins of “improved” biological resources towards a pathway of intensified sustainability in the Greek agrifood systems that reproduces dependencies and creates new injustices and vulnerabilities to the local farming communities.

Sotiris Alexakis is a PhD student in the History of Science and Technology working on a sustainability history of wheat production in Greece 1920-2000.

Stathis Arapostathis is Associate Professor in the History of Science and Technology in the University of Athens, working on history of sociotechnical transitions, politics of knowledge and technological infrastructures, transitions studies critical science and technology policy.

Yannis Fotopoulos is a Postdoc working at the interface of History of Technology, History of Technological Infrastructures, and the Politics of Sociotechnical Transformations

‘Beauty is in the eye of....’, value competition, alignment, and conflict in the development of transnational trade in resources (Frank Veraart, Maliene Kipa, Maite van den Borre, Bram Bouwens)

Trade in global resources has intensified over the last two centuries as industrializing societies explored new resources in the Global South. Developing resource networks cemented (neo)colonial interdependencies and affected economic, social, and environmental developments. Additionally, science and technological developments opened new possibilities with unfamiliar resources in industrial processes. This paper highlights the developments of use-values and exchange-values which have influenced the construction of transnational trade-networks. It investigates the plurality of use-values, i.e. the ability to satisfy human needs, by studying use-value propositions, the attribution of use-values through modern science practices, and diffusion of use-values through knowledge-politics. Furthermore, it explores the influence of technological developments in changing exchange-values, which opened global markets for interchangeable commodities. The paper presents first insights into research projects on edible oils and metal production as a lens to investigate these dynamics, which are crucial to explain trends and shifts in resource trade flows.

Frank Veraart is an Assistant Professor of history of technology at Eindhoven University of Technology. His areas of expertise include Modern and Contemporary History, Frank studies how international trade influences well-being and sustainability at places of excavation, production, and consumption. In this he focuses on the effects of the attribution of values to substances, the entanglement of regions by actors and its social, economic, and environmental contestations. Frank is project coordinator of the research project *Sustainability Trade-offs in the Netherlands’ Entangled Modernisation, 1900-2020* (STONEM)

Maliene Kip is a PhD candidate in history of technology at Eindhoven University of Technology. She is part of the STONEM project and studies sustainability trade-offs of the transnational trade of edible oils connected to the Netherlands.

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Maite van den Borre is a PhD candidate in social and economic history at Utrecht University. She is part of the STONEM project and studies sustainability trade-offs of the transnational trade of ores and metals connected to the Netherlands.

Bram Bouwens is an assistant professor in business history at Utrecht University and expert in histories of globalization. He has published on Dutch industries including Tata Steel, KLM, Heineken and other multinational firms located in the Netherlands.

Narratives of Global Fat: Aarhus Oliefabrik and United Plantations Company (Matthias Heymann)

This paper investigates different types of narratives of global development, trade and use of tropical plant oil resources such as coconuts and oil palm fruits. It takes the examples of the Danish companies Aarhus Oliefabrik in Aarhus, Denmark, and United Plantations in Malaysia, which played a pioneering role developing tropical oil resources and establishing global plant oil resource chains. In 1871, Aarhus Palmekærnefabrik, in 1892 renamed Aarhus Oliefabrik (AO), was established to process palm kernels and other oil rich fruits to produce basic vegetable oils and fats e. g. for margarine production. In the early 20th century, AO built up a trade network, trade agencies and even invested in tropical plantations for the production and import of oil resources. At about the same time, the Danish engineer Aage Westenholz, who had started a business career in Bangkok, started to invest in plantations in British Malaya and in 1917 founded the United Plantations Company (UP). The company started to invest in oil palm plantations in 1918, when the industry was in its infancy, and became one of the leading palm oil plantation companies in Malaysia. With reference to the history of these companies and developments in Denmark and Malaysia, I will discuss five different, sharply contrasting narratives about global plant oil ranging from the *industrial success* story and *heroic pioneers* narratives to *colonial exploitation*, *national development* and, more recently, *sustainability* narratives. I wish to discuss the question, whether and how

balanced narratives, reflecting colonial, environmental and developmental perspectives can be constructed.

Matthias Heymann is Professor of History of Science and Technology at the Centre for Science Studies at Aarhus University. He is co-coordinator of the Tensions of Europe Research Group Technology, Environment and Resources.

1.2 Datafying the environment, environmentalizing data 1: Datafying the oceans

Location: GD Hs8

Over the last decades, the environment and its governance have undergone a transformation towards progressive datafication. Environmental goals, indicator systems and performance reviews build on the availability of environmental data. As the environment becomes “datafied”, data become increasingly “environmentalized” – as proxies for the environment itself or currencies in environmental discourses. This ongoing transformation has become so comprehensive that scientific, political and economic knowledge about the oceans, the atmosphere, the land surfaces and the ice, and their governance, today rely on vast flows of data gathered, made evident, shared and consumed through a myriad of tools. Concepts such as “enviromedia”, the “digital climate/digital environment” or the “mediated planet” have been proposed to capture the epistemological, political, social and environmental implications of such transformation.

This panel series features empirical cases and examples that research on the history of the people, their technological, professional and institutional resources, their forms of organization, the power relations that go with them, and the perceptions that enable to generate, negotiate, disseminate, maintain and consume environmental data. The focus will be on environmental monitoring and sensing tools and operations in a broad sense. The aim is to gain understanding about the politics, epistemologies, technologies, vulnerabilities and social norms that made environmental data available and even vital for science and policy.

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Organizers: Gemma Cirac-Claveras, Sabine Höhler

The Co-Production of Data and Models: The Case of MedArgo (Lino Camprubí, Pablo Lima)

The Argo program for ocean monitoring has served environmental historians and media scholars as a vantage point from which to analyze some key processes involved in the transformation of oceans and seas around the world into mediated data systems. A vast global system of self-buoyant sensors which automatically and cyclically gather and transmit data to orbiting satellites, Argo was presented upon its turn-of-the-century founding as a “new era of oceanography”: constant global monitoring would enable scientists to capture change in real time and thus to map the interplay between local and global scales in ocean dynamics. Focusing on MedArgo (Argo’s Mediterranean branch) we aim at, on the one hand, capture the specificities of data acquisition, standardization and calibration in what is often referred to as a “miniature ocean” and, on the other, to understand how these specificities have helped oceanographers around the world to model climate variability through time. For that, we will show how scientific dataflows in the Mediterranean Sea, starting from measurement gathering to its final assimilation by modeling technologies, are instances of both data friction and co-evolution of knowledge.

Lino Camprubí is Professor of History and Philosophy of Science at the Universidad de Sevilla and the PI of the ERC-CoG DEEPMED.

Pablo Lima holds a degree in physics and a MA in epistemology and is currently pursuing a doctorate at the ERC-CoG DEEPMED.

The Oceans in a Database. Satellites, Datacentres and the Sea Level Rise (Gemma Cirac-Claveras)

Since the early 1990s, the rising sea level curve has increasingly acquired notoriety as one of the key indicators of global warming. Although there are many ways to measure the sea level, this curve often displays only data gathered with radar altimeters placed inside Earth-orbiting satellites.

This paper focuses on the history of the data regimes associated to two distinct datacentres that were built and maintained to promote the use of data collected by the satellites ERS-1 and Topex/Poseidon launched by the European Space Agency in 1991 and by a French/American coalition in 1992 respectively. I will argue that two particular forms of oceanographic knowledge were promoted, which, in turn, point out different ways of governing the oceans through data.

Gemma Cirac-Claveras is associate professor at the Institut d’història de la ciència of the Universitat Autònoma de Barcelona. She is currently the PI of the ERC StG CLIMASAT project.

The Pacific Blob: Ocean Warming, Datafied and Storified (Sabine Höhler)

The ocean seems vast and eternal. In human history, the ocean remained opaque and often featured in passing only, as a transit space or as a passive source and sink. The understanding that human societies are able to impact the ocean substantially, its species and habitat conditions and its climate and ecosystem functions, is a rather contemporary insight. Considering that we know about ocean environments primarily through collected information, datafied and storified, we must ask what our mediations reveal about ocean life and ocean environments and what they obscure. This paper explores the oceanic heat patch in the Pacific Ocean during the early 2010s. The mysterious pool of warm water developed off the coast of Alaska and triggered algae blooms which became toxic to marine life and humans alike. The so-called Pacific Blob was a novel environmental phenomenon that defied quick explanation. It borrowed from science fiction narratives of an uncanny and unquantifiable mass from the sea threatening to consume marine and human habitats. Science fact created amorphous collections of oceanographic data and temperature readings by satellite to trace the blob as a “Sea Surface Temperature Anomaly”. Both accounts normalized an alien and inexplicable nature without accounting for the slow disaster of global climate change. The paper questions the concept of “ocean literacy” and the perception of the ocean as a ‘legible’ data volume as an appropriate metaphor for the ocean of the Anthropocene.

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Sabine Höhler is Professor of Science and Technology Studies at the Division of History of Science, Technology and Environment at KTH Royal Institute of Technology in Stockholm. She is currently the PI of the project The Mediated Planet.

Negotiating the Earth Resource Satellite and its payload: delving into the Along Track Scanning Radiometer instrument as a Sea Surface Temperature data manufacturer (Hèctor Isern)

Earth observation satellite data take the form of scientific tools. As such, they embody materiality questions and specific practices, both entangled in composited global data infrastructures which transform the way humans comprehend and relate to environment. Due to its required nuancing, this paper focuses on a specific data, the Sea Surface Temperature (SST) collected with the Along Track Scanning Radiometer (ATSR) instrument as payload of the ERS-1. ATSR was designed at the 80s mainly by the British Rutherford Appleton Lab under the leadership of the climate scientist John Houghton. Concurrently, the European Space Agency was developing EARTHNET as the central ground element of the ERS-1. Both processes emerged with a new claim on higher resolution satellite data due to the new approach on small-scale processes demanded by the increasing environmental concerns. What negotiations involved the inclusion of the ATSR into the ERS-1 payload? What role played the ATSR promoters to make it perform as a technological driver for the small-scale approach? What political concerns were at stake? How did data negotiations correlated with scientific practises regarding SST data? This paper aims to delve into data history questions to understand how the technological change co-constructed our environmental knowledge.

Hèctor Isern is a PhD Candidate at the ERC-StG CLIMASAT project at the History of Science Institute (iHC-UAB) at the Autonomous University of Barcelona.

Scaling the deep sea: The materiality of deep sea data from a historical perspective (Tirza Meyer)

This presentation asks where knowledge about the deep sea is produced, how it is curated and where the ocean intersects with the land when data or information is transported from the deep ocean to the coast and into research labs. Deep-sea data is much more than simple temperature, salinity and oxygen measurements. Ocean data ranges from satellite retrieved bathymetry to map large underwater features to molecular studies looking into the DNA of single specimens that holds information about itself, but also its entire lineage and the deep geological history of the earth. When we study deep-sea data from a historical perspective, we see that scale and materiality are important factors when deep-sea ecosystems are ‘enviored’ and ‘mediated’. By examining the process of collecting different data on different scales, and looking at the curation of data, I hope to uncover the materiality of deep sea data and what it means for our understanding of the environment.

Tirza Meyer is a postdoctoral researcher at the division of history at KTH. She is a contemporary historian working on environmental history, media and underwater technology with a specific focus on the history of deep-sea research, governance, transnational diplomacy and resource distribution.

1.3 Transitions and Transformations in Energy History 1: Turning Points in Energy History and Societal Transformations

Location: GD 102

It has become common for energy historians to relate their work to contemporary debates and view historical changes in energy production, conversion and consumption through the lens of “transition”. As several historians have pointed out, however, history has not necessarily consisted of radical “transitions”, but often rather “additions” of new energy carriers and conversion technologies, or more gradual “transformations” of the prevailing energy constellations. Organized by the ToE energy history group, this panel series presents diverse case studies to inform discussions about transitions and transformations in energy history. Each in their own way, the

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papers provide fresh interpretations or uncover underexplored histories of energy. They question common assumptions and apply innovative approaches to the study of energy technologies as well as socio-technical continuity and change. Rooted in history of technology, they build bridges to political history, business history, environmental history, social ecology, and STS. By highlighting the question of transitions and transformations, this panel series will both inform the conference theme and provide new perspectives on energy history.

Organizers: Uta Hasenöhl, Odinn Melsted, Jan-Henrik Meyer

Chair: Odinn Melsted

Great Transformations: Social Revolutions Erupted During Energy Transitions Around the World, 1500-2013 (Marina Fischer-Kowalski)

Over the past 500 years, the transition to fossil fuels has been accompanied by sociopolitical upheaval, revolution, and counterrevolution in countries around the world. This research analyzes the relationship between shifts in the energy base of societies and transformative sociopolitical change for 66 countries since 1500. We found that two-thirds of all 52 identified revolutions occurred during the initial phase of the transition to fossil energy use (between 0.7 and 7.2 GJ/cap/year), a "critical energy transition phase" that lasted 42 years on average. This "critical energy transition phase" can be understood as an arena where social and economic adversaries met to contest past and future relations, a contest that resulted in turmoil, violence, and transformative social change. We also assess the impact of revolutions and counterrevolutions on the speed of energy transitions, finding that revolutions might accelerate transitions and repressions might slow them down. These findings are significant because similar sociopolitical developments may be associated with the current energy transition in response to catastrophic climate change, a product of the previous transition.

Marina Fischer-Kowalski: With a PhD in Sociology, I was discontent with social sciences' neglect of nature. I founded an Institute of Social Ecology

(1986) that ended up at the University of Natural Resources and Life Sciences, where I was full professor and still am engaged as senior researcher. I have been, among others, president of the International Society for Industrial Ecology and received an award for outstanding contributions to the field (2017), and chair of the scientific advisory board of the Potsdam Institute on Climate Impact Research (PIK, 2002-2010).

Energy Transitions: Learning from Futures Past (Pål Nygaard)

This paper outlines a project to investigate the past with new questions raised by the current need for a green shift: What can we learn from the drivers and barriers to past energy transitions? Since the green shift likely entails conflicts of interest, power struggles and risky business ventures, historians' key expertise in "analyzing long-term change and the difficult-to-express meaning of people's reaction to it" (Hirsh et al., 2014) will be useful to add nuance to the bulk of innovation-centric accounts of energy transitions conveying simplistic messages. The project analyzes three transitions in Norway, Spain and Sweden: (1) from biomass to coal (1800s), (2) from coal to petroleum (1880s-1930s), and (3) from fossil fuels to renewables (1970s-present). They will be analyzed along three dimensions: (a) how policymakers, producers and users of energy have envisioned the future, (b) how energy systems are debated in public spheres, (c) how maintenance of energy systems creates barriers and drivers to transitions.

Pål Nygaard is an associate professor of economic history at BI Norwegian Business School. He has worked on the history of engineering and technology, infrastructure, and business history. He is the PI of a commissioned history about SINTEF, Norway's largest independent research institute.

Turning Point or Just Another Transition? The 1970s in Historical Perspective (Patrick Kupper)

When OAPEC decided to cut its oil production during the Yom Kippur War in 1973, world crude oil prices started to soar. The rise in energy prices was accompanied by stagnating economic performance, high inflation rates and

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fears of absolute energy shortage. This so-called first oil price crisis, moreover, met with rampant debates on environmental pollution, energy dependence, and limits to growth in the face of finite resources. In my presentation, I will examine how this historical coincidence affected energy policy in both the short and long term. Do the 1970s represent a turning point towards a more sustainable energy supply? Or were they merely another transition in a long series of modern energy transitions? I will discuss the topic with a focus on Western Europe and the United States, but will also take a look at socialist Eastern Europe.

Patrick Kupper is Full Professor for Economic and Social History at the Universität Innsbruck, Austria. His expertise is in transnational economic, social and environmental history of modern Europe. He co-edited with Ute Hasenöhl the special issue “Historicizing Renewables”, History and Technology, 4, 2021.

Selling Sustainability: Renewable Energies as Environmental Development Aid and Growth Catalyst (Melina Antonia Buns)

Following the 1979 oil crisis, rising energy prices presented not only a political and economic challenge for the oil importing countries in the Global North, but also essentially hampered economic development possibilities of the Global South. In both regions, states shared an ambition to reduce their respective country's dependence on energy imports. Against the backdrop of an international development at the turn of the 1980s that tried to reshape previously failed modernisation theories, renewable energy technologies gained traction in World Bank and United Nations discussions. Connecting for one domestic with international energy transitions and for another environmental, energy and economic policy developments, this paper offers insights into how the sale of renewable energy technologies as development aid, benefitting from previously imperial structures, offered economic revenues for technology-producing countries and thus helped to boost a reconceptualisation of environmental politics as growth catalysts.

Melina Antonia Buns is Associate Professor of History at the University of Stavanger, Norway, where she is affiliated with The Greenhouse - Center for

Environmental Humanities. Her research interests are located at the intersection of environmental, energy, and international history. She is currently working on a project exploring the international dimension of radioactive waste and its technology-society-environment entanglement. Her work has appeared in Scandinavian Journal of History and Diplomata.

1.4 A history of Artificial Intelligence, a history to address an ‘existential risk/threat’: A ToE challenge

Location: GD 202

This session will invite the ToE community to discuss the challenge of writing a history of artificial intelligence, that is the challenge of writing a history that could usher in addressing an existential threat.

To kick-off the discussion, researchers from a series of ongoing EU-funded research programs, which face the challenge of contextualizing artificial intelligence through the help of contributions from the humanities, the social sciences and the arts, will be invited to offer introductory presentations.

Organizer: Aristotelis Tympas

Research programs to invite researchers from:

‘TECHNO-LOGIA Hub: Research Dissemination Hub on Art in a Techno-Logical Society’, 2021-2023

‘TETHICS GAME: A Serious Game for Innovative Education in Ethics of Technology’, EU ERASMUS+, 2023-2025

‘ETHICS4CHALLENGES -- Innovative Ethics Education for Major Technological and Scientific Challenges’, Erasmus+, 2022-2025

A total of four researchers will be invited to offer kick-off presentations, coming from France, Germany, Turkey and Greece

1.5 Unpacking Sustainability and Resilience in Urban Transformation Discourses: The Role of Situated Historiography

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Location: GD 203

Transforming cities into more sustainable or resilient places is high on the agenda of researchers, city governments, activist groups, NGO's, architects and urban developers all over the world. Facing climate change and environmental issues, enhancing urban sustainability and resilience is one of today's grand societal challenges. Technologies and infrastructures play an important role in addressing this challenge. New and emerging technologies are often seen as a means to fulfil the goals of sustainability and resilience. As urban infrastructures are notoriously difficult to change, transforming cities into more sustainable and resilient environments, is a daunting task. This panel aims to unpack the contested nature of "sustainability" and "resilience" within the wider debate on urban transformation. In debates about urban transformation, the terms sustainability and resilience seem to have a universal meaning, and act as "ideographs" – abstract concepts that have a flexible and often inherently positive meaning. This panel wants to look into the possibilities for historical, situated research, to challenge the supposedly universal nature of the terms. The papers in this session take a critical look at discourses of sustainability or resilience in attempts to bring about urban transformation in cities in various geographical settings (Stockholm, Maastricht, Bangladesh and Uzbekistan) and in different historical time periods. The five selected papers focus on urban transportation and mobility infrastructure in particular.

Organisers: Anique Hommels, Jonas van der Straeten

Discussant: Timothy Moss

Hidden Unsustainabilities of a Livable Street (Martin Emanuel)

This paper focuses on the development of what is today two parallel mobility infrastructures stretching between Stockholm's city center and the suburbs in the south: the ground-level street Götgatan and the underground highway Söderledstunneln. As the tunneled road opened in 1984, overnight, traffic in Götgatan more than halved, which eventually opened up for a redistribution of space from cars to pedestrians and cyclists— often hailed as a success from an urban livability point of view. This paper offers reinterpretation by

inquiry into debates and events at two different points in time. Firstly, as Götgatan was widened in the late nineteenth century, its northernmost end, with the residences of the urban elite, was spared, which later led instead to the substantial clearings of working-class neighborhoods to give way for the future underground highway. Secondly, as urban environmental groups protested against how the opening of Söderledstunneln would encourage urban automobility and jeopardize sustainability, their efforts were ultimately in vain. The paper shows how present-day steps towards livability and sustainability can sometimes be intertwined with and even dependent on past unjust or unsustainable developments.

Martin Emanuel is a historian of science and technology and a researcher in the Department of Planning and Environment, KTH Royal Institute of Technology. His expertise is in urban and mobility history and social science mobility studies with a particular focus on sustainable mobility (pedestrianism, cycling) including policy making, innovation, and grassroots initiatives.

Undoing Unsustainability in Maastricht's Tunnel Project (1950-2016) (Anique Hommels)

This paper studies a major urban transformation in the Dutch city of Maastricht: the construction of a tunnel for motorway traffic through the city. The motorway was constructed in the 1950s and already in the early days of the project, the idea of building a tunnel at that location was considered. For various reasons that will be addressed in the paper, the actual building of the tunnel did not happen until the 2010s. This paper will argue that, in the discussions and negotiations around the tunnel plans, various conceptions of (un)sustainability played a decisive role. Focusing on a number of key historical turning points in the Maastricht tunnel project, the paper will delve into the interpretative flexibility and historical variability of the notion of sustainability. The paper aims to show how discourses of (un)sustainability informed different transformation pathways in the tunnel project and ultimately challenged the obduracy of this mobility infrastructure.

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Short biography: Anique Hommels holds a special chair in Sociohistorical Technology Studies at the MUSTS research group of the Faculty of Arts and Social Sciences (Maastricht University). This chair is supported by the Foundation of the History of Technology (SHT). Her expertise is in urban sociotechnical change, obduracy and vulnerability of (critical) infrastructure. In her research, she brings together insights from Science and Technology studies (history and sociology of technology) and urban studies.

Gender-Sensitive Infrastructure: An Agenda for Sustainability and Resilience in Urban Transformation Discourses? (Conrad John Masabo)

Enhancing sustainability and resilience in urban infrastructure discourse calls for taking gender seriously. Unlike what is often thought, men and women benefit equally from public investments in urban infrastructure, experience in most of the urban mobility trends have indicated otherwise this assumption is misguided. This is so since men and women have different mobility patterns due to their specific different social roles, economic status or preferences and thus if all are to benefit equally, urban transformation discourses especially those on infrastructure have to be more attuned to considering and taking issue of different gender needs seriously in urban infrastructure planning. This paper then intends to advance an argument in favour of gender-sensitive urban transformation discourse in transport infrastructure planning.

Conrad John Masabo is a PhD Candidate in the Department of Government and International Studies at Hong Kong Baptist University. He obtained his first degree in History, Political Science and Education from the University of Dar es Salaam in 2010. Masabo is a social scientist with a strong background in political science, regional studies and childhood studies. Masabo has published in the field of Chinese politics, children rights, peace and conflicts and African democracy.

“Green Cities Development” in Samarkand, Uzbekistan: Unveiling the Tension between Global Funding Trends and Neglected Infrastructural Maintenance (Mariya Petrova)

In 2022 the city of Samarkand was the first, and so far the only one in Uzbekistan to be included into the Green Cities Development program of the EBRD. The first loan-package of 49 million \$ should be spent on the purchase of 100 battery-busses and needed infrastructure which is framed in terms of reducing the carbon emission and raise the environmental resilience of the city. In general Uzbek authorities seem to be quite successful in deploying the new sustainability rhetoric to raise funds for infrastructural development projects which are currently burgeoning all over the country. At the same time older projects, which require investment into the maintenance and appear less glossy as for example a second-hand tram-system installed in 2017 remain neglected. Taking the example of the recent changes in public transport system in Samarkand, Uzbekistan the paper argues that the global developmental funding infrastructure and climate change prevention vocabulary provide governments with a welcome excuse and incentive time and again to embark on new infrastructure projects, instead of maintaining the existing ones.

Mariya Petrova is a dedicated researcher in the project “Contentious Mobilities: rethinking mobility transitions through a decolonial lens” at the Leibniz Institute for Regional Geography (IfL) in Leipzig Germany. Before joining this institute, Mariya served as a Research Associate from 2018 to 2020 in the project “A Global History of Technology, 1850–2000” at Technische Universität Darmstadt, Germany. Her research interests span various facets of urban studies, with a particular emphasis on infrastructures in the Soviet-and post-Soviet regions. Her work delves into topics such as public transportation, governance and decision-making processes, as well as the anthropology of governance.

Electric futures and three wheeled pasts? Battery rickshaws in the discourse on sustainable transport in Bangladesh (Jonas van der Straeten)

The transition from fossil fuel-powered to electric mobility is widely discussed as a trajectory towards more sustainable transport infrastructures. Widely ignored in academia, this transition has occurred earlier, faster, and more profoundly in Bangladesh than in Europe or the US but under

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conditions almost diametrically opposed. Without any national policy to support it, the transition has been driven by the country's informal economy. However, rather than being framed as a potential technology for "greening" public transport, electric rickshaws are subject to controversies, bans, and exclusion from policies for electric vehicles. This presentation explores the reasons behind the conflicts surrounding the proliferation of electric rickshaws. It shows how national-level policymakers and business elites mobilize imaginaries of sustainability *against* electric rickshaws and rely on strategies of "othering" them in (eco-)modernist narratives of social change. In these narratives history looms large, especially the country's specific legacy of three-wheeled transport that contributes to the general framing of rickshaws as a "thing of the past", standing for almost everything that the country wants to overcome on its modernization path – the unregulated, informal part of the economy; the congested cities; and the high number of road accidents.

Jonas van der Straeten is Assistant Professor at the Technology, Innovation and Society Group at Eindhoven University of Technology. In his research, he studies processes of technological change in Africa and Asia from a systemic, transdisciplinary, and global perspective. His major areas of interest are electricity, housing, and – more recently – mobility. Jonas has a track record both as a historian of technology and as a consultant for projects on energy access in countries of the Global South. He has worked as postdoctoral researcher at the University of Technology Darmstadt in the project "A Global History of Technology, 1850 – 2000", funded by the European Research Council. He holds a PhD from the Darmstadt University of Technology.

1.6 Digitalization (individual presentations)

Location: GD 204

Sonic media spheres: Progress and regression in the realm of audio media
(Martyna Kopeć)

The research project focuses on sound media and related practices such as „circuit bending“, i.e., the creative modification of low-voltage electronic devices. Investigating the transformative landscape of sound media in the digital era, the study examines the shift from analog to digital realms, utilizing emulations and sample libraries mirroring analog characteristics. The study involves conducting interviews with both sound media artists and users, coupled with the analysis of case studies employing a media archaeology approach. The main question concerns whether societal, political, and economic progress propels technological development or whether technological knowledge independently influences anthropocentric progressions. The project combines phenomenological and media archaeological perspectives, aiming for a nuanced synthesis. Ethnographic interviews with practitioners align with a phenomenological approach, while case studies of digital sound devices draw from media archaeology. A combination of both of these approaches should provide a better understanding of progress in the context of audio media.

Martyna Kopeć is a Cognitive science (BA) and Cultural studies (MA) graduate at Nicolaus Copernicus University in Toruń, Poland, where she is currently pursuing a PhD in Cultural studies. Her main research interests focus on sound studies, anthropology of music, and media theory.

Humans as ‘very complicated, exciting, and beautiful machines’: From 1960s computer-based concepts of death to 2010s births by artificial intelligence (Kornilia Papanastasiou/Kostas Raptis, Katerina Vlantoni)

The paper introduces to representative episodes from the integration of electronic computing technologies into medical diagnosis, focusing on the ways this has changed medical practice. We place the emphasis on visions and concerns of engineers, scientists and physicians regarding the automation of medical practice through computerization in the last 60 years. We also invite attention to the ways automation processes affected the object of automation itself. The paper starts by comparing the successful introduction of computed tomography to the failure to computerize the Pap smear (Raptis) and concludes with a presentation of the black-boxed biases

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of assisted reproduction that relies on algorithms for embryo selection and live-birth occurrence/prediction (Papanastasiou).

The primary sources are articles from the scientific, engineering and medical press. Our attempt takes into consideration the dynamics between the state, the market and the scientific/engineering communities in the different periods, and the changing computing environment. At the same time, we seek to discern continuities and transformations of the demand for automation through the years and the different versions of available computing technologies.

Kornilia Papanastasiou (korniliapap@phs.uoa.gr) is a doctoral student at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens, Greece, specializing in STS/historical approaches to technology. Her dissertation, titled 'Contextualizing the integration of AI and Big Data into reproductive technologies', is supported by a 3-year fellowship by the Hellenic Foundation for Research & Innovation. She has presented parts of her research in several international conferences and has participated in summer-winter schools, graduate training programs and courses. Representative publication: Vlantoni, K., & Papanastasiou, K. (2022), "LIVE FROM THE WOMB" Historicising the Integration of Artificial Intelligence into Biomedicine, *ICON: Journal of the International Committee for the History of Technology* 27, no 1, 139-157.

Kostas Raptis has recently defended his dissertation (NKUA, Athens), titled 'The integration of computers in medical technologies and the concept of death'. His research was supported by a doctoral dissertation fellowship by the State Scholarships Foundation of Greece. He has presented his research at several Greek and international conferences.

Katerina Vlantoni was recently elected assistant professor at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens. She is the Principal Investigation of the postdoctoral research project *BIO-CONTEXT: Contextualizing biobanking in Greece: histories, practices, discourses*, funded by the Hellenic Foundation for Research & Innovation. She has worked as adjunct faculty at the Department

of Biomedical Engineering, University of West Attica, and at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens. She specializes in the historical and STS study of medical/biomedical science and technology.

The CD-ROM as a Digital Game-Changer (Valérie Schafer)

The role of CD-ROMs has often been underestimated in the journey towards digitization and media convergence (Jenkins, 2006) by the current state of the art (Schafer, 2022), leading to limited exploration (although we may mention some analysis in game studies, like Therrien, 2019, as well as in the field of cultural heritage, i.e, Lavigne, 2005). However, the discourse on the revolution they brought about was present from the mid-1980s to the mid-1990s (see for example press coverage like Cook, 1990; Peyret, 1996, the development of specialized press, and the paper by Helgersen, "CD-Rom: A Revolution in the Making", 1986 and the book by Borrell, *The CD-ROM Revolution*, 1995).

The presentation aims to delve into this sense of revolution and the CD-ROM's role in creating and facing transformations and serving as a digital transition. It will focus particularly on the CD-ROM's place in the media convergence that was unfolding in the 80s and 90s and the imagined and perceived changes brought about by their development. By studying the CDROM as a "revolution" in its time, its transformations, and its role in the transition to Internet and Web usage, we aim to reevaluate this artifact in terms of both its physical aspects and content, rethinking its place in the genealogy of computing and digital technology, as well as its legacy and impact on subsequent digital developments.

Valérie Schafer has been a Professor in Contemporary European History at the C2DH (Luxembourg Centre for Contemporary and Digital History) at the University of Luxembourg since February 2018. She previously worked at the CNRS in France and is still an Associate Researcher at the Center for Internet and Society (CIS – CNRS UPR 2000). She specializes in the history of computing, telecommunications, and data networks. Her main research interests are the history of Computing, of the Internet and the Web, the

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history of European digital cultures and infrastructures, and born-digital heritage (especially Web archives). She is currently the chair of the Tensions of Europe Management Committee (2022-2024).

Cows and Computers: Electronic Data Processing in German Cattle Farming, 1950s-1990s (Martin Schmitt, Veronika Settele)

When we look at the major transformations in the industrialised world since about 1970, agriculture is usually portrayed as being on the losing side of history. Computers, chemistry and electronics were seen as the future, agriculture as yesterday's news. Despite that popular image, cattle farming for example saw enormous spikes in productivity in the second half of the 20th century in both German states. In the FRG, the milk yield per cow nearly doubled since the 1950s, from 2480 kilograms per year to 4710 kg in 1990, and we see a similar trend in the GDR. Today, the milk production of an average cow reaches up to 8500 kg per year while the total amount of cows and farmers shrank accordingly; a single farmer is currently feeding up to 139 people. Around 1960, a West German dairy farmer fed around 16 people, as state statistics reveal. In the same period, agronomists began to acquire, use, and recommend computers for first agricultural organizations and little later single cattle farms. Agriculture underwent a profound transformation, socially, economically, and technologically.

Economic rationalization of agriculture, that is strategic planning and cost accounting, had entered the scientific and political scene since mid-18th century economic enlightenment culminating in the figure of Albrecht Daniel Thaer. Since late 19th century easy to understand advisory literature had encouraged farmers to focus more on how much their cows yield instead of owning more cows than their neighbor. Against the background of having been optimized for two centuries, we examine the role of electronic data processing (EDP) in cattle farming since the 1950s to explain the unprecedented rise in productivity.

Agriculture has been neglected in the history of computing so far, perceived as “outdated” in the passage to the information society. This obscured that certain actors in agriculture were early adopters of EDP. In this paper we

scrutinize EDP in FRG and GDR in a transnational European perspective on two levels: On the intercorporate level of agricultural organizations such as breeders' associations and state-ruled insemination stations we show, how data processing in computing centers took genetic theory to a new practical level. On the level of single farms and cooperatives we examine how EDP changed farm management and cattle handling.

By doing that, we also shed light on the moral history of cattle farming which is inextricably linked to current debates around industrialized livestock production. EDP increased the simultaneity of non-simultaneities in agriculture. While “computer-farms” transformed animals and their body processes in business figures, the larger public continued to imagine animal farms as supratemporal sites of nature. Looking at these transformations, the proposed paper aims to bring the history of agriculture and social history of animal farming into the history of computing.

Martin Schmitt is a research and teaching fellow at the Historical Institute of Paderborn University. His research interests range from contemporary European history to questions of digitalization and computer networking to environmental history. He has a permanent position for digital history, focusing on the critical reflection of the history of computing and the use of data-driven approaches in historical research. His dissertation *Die Digitalisierung der Kreditwirtschaft. Computereinsatz in den Sparkassen der Bundesrepublik und der DDR 1957-1991* was published by Wallstein, Göttingen, in 2021. He has received several awards for his work on the history of computing in East and West Germany, including the Award of the Society for the History of Science, Medicine and Technology 2020 and the Weizenbaum Award 2021 (3rd prize) of the Forum of Computer Scientists for Peace and Social Responsibility e.V.

Veronika Settele is a historian of modern times, particularly interested in societal change and the historical roots of our time. In her first research project she sought to understand how humans and animals interacted practically, economically, and psychologically. Veronika has recently pursued these topics in two monographs, *Revolution im Stall: Landwirtschaftliche Tierhaltung in Deutschland, 1945–1990* (Göttingen: Vandenhoeck &

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Ruprecht, 2020, winner of the Volkswagen Foundation's Opus Primum Prize, the German Thesis Award and the Friedrich-Meinecke-Prize) and *Deutsche Fleischarbeit: Geschichte der Massentierhaltung von den Anfängen bis heute* (C.H. Beck: Munich, 2022), the edited volume *Nicht-Essen: Verzicht, Vermeidung und Verweigerung in der Moderne* (together with Norman Aselmeyer, Beiheft der Historischen Zeitschrift 73, 2018) and through articles in various journals. Since 2023, she has been a junior research group leader in the focus project "Behind the Norm. Practices of Sexuality between Secularization and Scientification, 1848-1930" at University of Bremen.

10:30-11:00

Coffee break

Location: GD Aula

11:00-12:30

2.1 Towards sustainability of global resources, fair trade and global justice? Experiences, challenges and narratives of transformation (II)

Location: GD Hs3

Climate change, rising resource competition and global inequality pose tremendous challenges to contemporary societies around the globe and urgently require fundamental processes of transformation to sustainable practices and global justice. Proxy and local wars as well as numerous political and economic tensions make modern development even more risky and complicated. These transformations require significant technological, institutional and cultural innovations and the creation of societal acceptance to such innovations. Historical research contributes valuable knowledge about the complexities, conflicts and impediments of such transformations as well as experiences of successful cases and best practices.

This panel will offer historical research about cases and examples in all relevant domains around the globe. Topics of interest comprise historical cases of technology and transformation in resource extraction, distribution, availability and consumption, for example in the development and use of natural resources, energy transition, mobility turnaround, shifts in production, changes in consumption etc. The panel has goal to enable comparative discussion of local and global narratives about this transformation and the versatile roles of technology in it.

Organizers: Matthias Heymann, Elena Kochetkova

The development of harbour and steamship infrastructure for resource extraction and distribution: Colonial Nigeria in perspective (Nkemjika Ihediwa)

Technological innovations and development served as critical components for the development of infrastructures of resource extraction and distribution in colonial Nigeria. With the British encounter in the middle of the 19th century, everything changed for the local people. The first focus of British mercantilist policies was to develop harbours along the coastal communities of Nigeria and to introduce steamship technology. New harbour infrastructures in Lagos, Calabar, Niger River, Ethiop River, and Portharcourt served as a local network of moving natural resources for onward shipment to England. The steamships and gunboats worked together in the pursuit of resources across the length and breadth of Nigeria; the Consular Trade under the Royal Niger Company succeeded in becoming the eye of the Crown in Nigeria inland and coastal trade. The paper will show how colonial resource extraction and distribution was facilitated by the development of harbour and steamship infrastructures of the British in Nigeria. It will show how these infrastructures stepwise deepened resource extraction, distribution and profit maximization to the detriment of the indigenous people and local economy.

Nkemjika Ihediwa is a senior academic staff in History Department, University of Nigeria, Nsukka, Nigeria. His areas of research interest include social and political history, genocide studies and environmental history. He

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has attended many conferences within and outside Nigeria, and has published in learned journals and contributed chapters in edited book volumes.

State Socialism and the Sustainable Use of Natural Resources (Elena Kochetkova)

Traditionally seen as a space of conquering nature, state socialist projects often appear in scholarly works as devastating, polluting, and unsustainable. Recent research, however, approaches socialist states as part of global development and emphasizes their more obvious roles in the making of global trade and resource and knowledge exchange along with their roles in comprehending environmental crises and global development. My presentation will focus on the question of sustainable use of natural resources under state socialism in Eastern Europe with a particular emphasis on the late Soviet Union. I will examine how the Soviet producers and politicians discussed the problem of resource devastation and resource scarcity in the context of discussions about global environmental crisis. Via the lens of history of technology and environmental history, I will show that there has been a significant concern over the future of natural resources as an industrial resource which adapted and produced a number of influential discourses, such as rationalization, complex use, and economization. All together, they present state socialism as not a space of ecocide only, but a complex relation between industry and nature.

Elena Kochetkova is Associate Professor in Modern European Economic History at the Department of Archeology, History, Cultural Studies and Religion at the University of Bergen. She is the author of the monograph “The Green Power of Socialism” (forthcoming with The MIT Press). She served as a Secretary of the European Society of Environmental History from 2019 to 2021. She is co-coordinator of the Tensions of Europe Research Group Technology, Environment and Resources.

Discussing the Environment - Technology Nexus at the 1971 UNECE Symposium on Environmental Problems (Jiří Janáč)

In the spring of 1971, the United Nations Economic Commission of Europe (UNECE) organized a Symposium on Problems Relating to Environment. The event brought together 250 experts from relevant fields from Europe. Representatives of technocratic circles (mostly managers, engineers economists, and public officials) from various European countries met to discuss and develop political tools for improvement of environmental situation and prevention of the looming ecological and developmental crisis. While the Symposium did not make it into history textbooks (Kaiser and Meyer 2019), it certainly marked one of the earliest attempts at a comprehensive “management” of issues identified as environmental at an international or even global level. The aim of the paper is to explore what specific sites of resource extraction have featured prominently in the debate and how their environmental situation has been interpreted in relation to technology and further development. Since the whole symposium presented itself as a space for discussing the problems of the “most developed part of the world”, what space was there for the “global” dimension of the problem? And did ethical issues come up in the discussions at all, or did the participating “technocratic” stick to technical solutions?

Jiří Janáč received his PhD from Eindhoven University of Technology and currently he works at the Institute of Contemporary History of the Czech Academy of Sciences. His research focuses on enviro-technical history of state socialism in Czechoslovakia and East Central Europe. He has published two books on the topic: *European Coasts of Bohemia: Negotiating the Danube-Oder-Elbe Canal in a Troubled Twentieth Century* (Amsterdam 2012), *The Cult of Unity: The Stalin Plan for the Transformation of Nature* (with Doubravka Olšáková, Prague 2020), and currently submitted manuscript of the third one “Hydro-socialism? We only have the water which falls on us.”

2.2 Datafying the environment, environmentalizing data 2: Data and resources

Location: GD Hs8

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Over the last decades, the environment and its governance have undergone a transformation towards progressive datafication. Environmental goals, indicator systems and performance reviews build on the availability of environmental data. As the environment becomes “datafied”, data become increasingly “environmentalized” – as proxies for the environment itself or currencies in environmental discourses. This ongoing transformation has become so comprehensive that scientific, political and economic knowledge about the oceans, the atmosphere, the land surfaces and the ice, and their governance, today rely on vast flows of data gathered, made evident, shared and consumed through a myriad of tools. Concepts such as “enviroming media”, the “digital climate/digital environment” or the “mediated planet” have been proposed to capture the epistemological, political, social and environmental implications of such transformation.

This panel series features empirical cases and examples that research on the history of the people, their technological, professional and institutional resources, their forms of organization, the power relations that go with them, and the perceptions that enable to generate, negotiate, disseminate, maintain and consume environmental data. The focus will be on environmental monitoring and sensing tools and operations in a broad sense. The aim is to gain understanding about the politics, epistemologies, technologies, vulnerabilities and social norms that made environmental data available and even vital for science and policy.

Organizers: Gemma Cirac-Claveras, Sabine Höhler

Chair: Gemma Cirac-Claveras

Mapping others’ green: the Cartographic Institute of Catalonia, SPOT, and the territories of Latin America (Andrea Álvarez)

A knowledge infrastructure is required to produce, use, circulate and archive satellite data from the Earth. Infrastructure that hasn’t been –and still isn’t – symmetrical concerning data access, governance, and distribution. The case study will be specially crossed by these asymmetries: a monitoring project led by the Catalan Cartographic Institute (Spain) that used SPOT data to map regions in Latin America during the 1980 and 1990s. Throughout this period,

monitoring efforts in Latin America were embedded in both local dynamics on gaining national sovereignty to map lands and global remote-sensing technologies reification as tools for development.

By means of extensive archival and oral records, I aim to examine how the different epistemic, political, material, technological, and social actors’ conditions can inform who, how, and for what got engaged with satellite technology to produce data, representations, knowledges, and actions on the territory and environment. With this, I pose questions on power and technology uses, discourses and resistances to investigate how satellite technology can both perpetuate and transform scientific, political, social, and environmental landscapes.

Andrea Álvarez is a PhD Candidate at ERC StG CLIMASAT at the History of Science Institute (iHC-UAB) at the Autonomous University of Barcelona.

“The possibility of making a complete study of the biosphere”: UNESCO’s Man and the Biosphere programme and the pursuit of environmental data (Santiago Gorostiza)

Writing in 1971 about the recently launched Man and the Biosphere programme (MaB), the Director of the Division of Natural Resources of UNESCO argued that data on biological variables was “much too often inadequate for providing unbiased statements about environmental processes”. Conceived as an intergovernmental scientific programme aimed at identifying and assessing the impacts of human activities in the biosphere, one of the declared objectives of MaB was to establish methodologies for the acquisition and processing of environmental data, as well as to facilitate the circulation of knowledge to address environmental problems. Building on archival work on the UNESCO archives, this paper will explore both the institutional activities carried out between the 1970s and 1980s to attain these objectives and the attention to produce, process and disseminate environmental data as one of the justifications of MaB.

Santiago Gorostiza is an environmental historian working at the intersection of political ecology and the history of science. Currently a postdoctoral researcher at the Universitat Autònoma de Barcelona.

Actors, Contexts, and Technologies in Swedish Forest Monitoring 1980-2000 (Erik Ljungberg)

Data is information about something for someone depending on the context, but determining the proper context is easier said than done. In this talk, I use the term contexting to show satellite data use depends on actors translating contexts into their own context, and in turn being translated by others. I highlight four snapshots from the network in which Swedish forest data circulated between 1980-2000. First, Hughes Aircraft Company engineers' efforts in the early 80s to create sensors with pure spectral separation. Second, the work of GIS-specialists the Swedish company Satellus to automatically align spatial geometry of images with standardized coordinate systems. Third, Swedish Land Survey cartographers work to make the first digital map of Sweden. Fourth, the Swedish Agricultural University remote sensing engineers who used the map and data to develop automated forest estimation. Through these snapshots, I aim to provide understanding of how satellite data takes on meaning through connections between actors, contexts, and technologies over time.

Erik Ljungberg is a doctoral student affiliated with the project “The Mediated Planet” at the Royal Institute of Technology. His current research focuses the digitization of Swedish forestry between 1980 and today with a special focus on the importance of machine learning and artificial intelligence.

Environmental Data for Afghanistan (Shah Mahmoud Hanifi)

My research on the largely unexplored environmental history of Afghanistan focuses on the impacts of global capitalism and international warfare on local livelihoods in rural areas since the country's independence in 1919. From 2001 to 2021, the US Forest Service and Department of Agriculture, and the universities of California-Davis, Purdue and Iowa State, established and sustained multiple large projects relating to the environment of Afghanistan. This paper arises from the extensive data sets held at these institutions relating to the forests, rivers, and animals of Afghanistan. The paper addresses a) US-based technologies producing this environmental data and

the US institutional audiences for that data, and b.) the presence of Afghan support staff in the data and impacts of that data on local populations. The paper concludes by positioning publicly accessible data against the largely inaccessibly securitized remote and satellite data concerning the environmental impact of US military operations in Afghanistan.

Shah Mahmoud Hanifi is Professor of History at James Madison University where he teaches courses on the Middle East and South Asia. Hanifi's publications have addressed subjects including colonial political economy and intellectual history, the Pashto language, photography, cartography, animal and environmental studies, and Orientalism in Afghanistan.

East African technicians and the birth of ‘resources for development’ (Ismay Milford)

While historians increasingly emphasise how the environment ‘became global’ through technologies like remote sensing satellites, we still have a limited understanding of what this meant for countries in the so-called Global South –typically portrayed as receivers of technology. A view from East Africa demonstrates the limits of technological determinism by highlighting social histories of training and their relevance to inequalities in environmental data production.

Today, Nairobi is a continental hub for remote sensing, framing its work within the remit of ‘sustainable development’. But its history predates this concept, extending to colonial aerial surveys and more concretely to the founding of the Regional Centre for Services in Surveying, Mapping and Remote Sensing in 1974 –shortly after Nairobi was chosen as UNEP headquarters. This paper introduces East African technicians, trained by the European Space Agency and others to apply Landsat data, who worked with concepts like ‘resources for development’ that nuance the extraction/protection dichotomy.

Ismay Milford is a Marie Skłodowska-Curie Postdoctoral Fellow in Global History at Freie Universität Berlin. She is now developing a project on environmental knowledge and satellite technology in East Africa.

2.3 Transitions and Transformations in Energy History 2: The Making and Shaping of Natural and Biological Gas in Europe

Location: GD 102

It has become common for energy historians to relate their work to contemporary debates and view historical changes in energy production, conversion and consumption through the lens of “transition”. As several historians have pointed out, however, history has not necessarily consisted of radical “transitions”, but often rather “additions” of new energy carriers and conversion technologies, or more gradual “transformations” of the prevailing energy constellations. Organized by the ToE energy history group, this panel series presents diverse case studies to inform discussions about transitions and transformations in energy history.

Each in their own way, the papers provide fresh interpretations or uncover underexplored histories of energy. They question common assumptions and apply innovative approaches to the study of energy technologies as well as socio-technical continuity and change. Rooted in history of technology, they build bridges to political history, business history, environmental history, social ecology, and STS. By highlighting the question of transitions and transformations, this panel series will both inform the conference theme and provide new perspectives on energy history.

Organizers: Uta Hasenöhl, Odinn Melsted, Jan-Henrik Meyer

Chair: Anna Åberg

Trembling Earth: An Environmental History of Gas in the Netherlands (Marin Kuijt)

From the 1960s onwards, gas became a crucial energy source in Europe. The history of gas has mainly been studied in the context of geopolitics, large technical systems, and energy policy. The gasification of Europe also added extra fuel to the Great Acceleration, the unprecedented increase of greenhouse gas emissions and pollution since 1945. Yet, gas is often thought

of as having a light local environmental footprint. This paper critically examines this assumption by investigating the environmental history of gas in the Netherlands. The paper asks how gas infrastructure shaped the landscapes around the gas field. This paper draws on documents from national, regional, and corporate archives in the Netherlands. By approaching gas infrastructure as an envirotechnical system the paper argues that although gas infrastructure often remained invisible it caused unprecedented changes in local landscapes, from poisoned ground water to earthquakes.

Marin Kuijt is a PhD student at the Amsterdam School for Historical Studies, University of Amsterdam. His project ‘Colonial Carbon: How Oil and Gas Extraction Shaped the Netherlands and its Empire, 1920-1965’ focuses on the political economy and environmental history of fossil fuel extraction in colonial Indonesia and the Netherlands. Together with Peter van Dam he is editing a volume on the history of gas in the Netherlands, which is set to be published by Brill in 2025.

Energy Dependence Beyond Geopolitics: The Case of “Red Gas” in Austria (Robert Groß)

Debates about energy dependence tend to focus on geopolitics while ignoring the role of regional activity and demand-oriented policies. This paper elaborates on how the energy crisis of the 1970s and the environmental awareness of the 1980s allowed natural gas (NG) to become a critical weapon against oil dependency and air pollution. Referring to Austrian examples, I will discuss how oil companies used NG to position themselves as the solution to a self-inflicted problem by opening up new markets and accelerating the transition from coal and oil to NG. The very act of switching to a less dirty fuel, without questioning the underlying growth dynamics, forced the federal government to continually sign new import contracts with the USSR/Russia. In other words, clean air policies and oil dependency considerations contributed to a long term path dependency on NG-based energy systems that is now an almost intractable problem.

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Robert Groß is a trained human ecologist and received his Ph.D. in environmental history from the University of Klagenfurt in 2017 with a dissertation on the environmental history of winter tourism in Austria. Since 2019, he has been working on a habilitation thesis on European energy history, which will be submitted to the University of Innsbruck/Austria. He has been a fellow at the Rachel Carson Center and the Deutsches Museum. He is also coordinator of the Center for Environmental History and regional representative for the German-speaking countries in the European Society for Environmental History (ESEH).

Valorga: a French Green Business Firm, from Antinuclear Movements to Multinational Companies (Anaël Marrec)

Through the history of Valorga, this contribution examines the trajectory of a French biogas technology company created in the wake of anti-nuclear mobilisations in the 1970s, in two emblematic sectors of Green Business in the 1980s, namely renewable energies and waste. The history of Green Business has not yet paid much attention to renewable energies in France, and biomass energy policies are still understudied, whereas they played an important role in the renewable energy policies of the 1980s, although they were less widely publicised. The aim is to look at the motivations of Valorga's stakeholders (Gaz de France (GDF), Agence française pour la maîtrise de l'énergie, municipalities) and how they evolved from the company's activist beginnings to its takeover by the GDF - Spie Batignolles - Idex consortium. In particular, it will examine the idea that the decentralised project promoted by the environmental and anti-nuclear movements of the 1970s has been hijacked by the integration of renewable energies into the energy networks.

Anaël Marrec is a historian of 20th century energy with a dual approach of history of technology and environmental history. She examines technological responses to changing economic and environmental contexts, as well as the social conflicts and ecosystem transformations that accompany their implementation. She is particularly interested in renewable and nuclear energy.

Privatizing Italian Energy: Socio-environmental Conflict and Technological Shifts (1986-1999) (Filippo De Chirico)

Italian energy policies were marked by several dramatic shifts in the late 1980s. On the one hand, nuclear plants were phased out after a referendum in 1987; while simultaneously widespread protests against the construction of oil- and coal-fired thermoelectric facilities forced Italy to steer itself towards natural gas as a primary energy source. Pipelines built in the mid-1980s allowed for increased imports from Algeria and Russia, thereby nearly doubling natural gas consumption between 1986 and 1999. While natural gas was becoming increasingly important in the Italian energy mix, monopolistic State-owned corporations (ENI/SNAM and ENEL) became commercial firms operating in a regulated market. My paper will cover how socio-environmental conflict shaped the narrative on privatizations and influenced policy-makers; highlight how technological factors facilitated institutional transformations; and examine how these transformations affected the composition of the national energy mix.

Filippo De Chirico is a Ph.D. student in Political Science at Università Roma Tre (Italy). His research focuses on the history of the natural gas industry in Italy between the 1930s and the 1990s (Supervisor Prof. Giuliano Garavini). Filippo holds a BA in History from the University of Bologna, and a MA in Environmental History from Università Roma Tre, where he graduated with a thesis on the privatization of the Italian electric industry. He is a contributor to the New Books Network podcast, where he regularly interviews authors publishing on economic and energy history.

2.4 Transport (individual presentations)

Location: GD 202

The Role of a Technical Journal in the Evolution of the Road Building Industry: A Century with Dansk Vejtidskrift (1924-2024) (Jørgen Burchardt)

A technical journal plays a pivotal role in providing essential support to businesses by keeping its audience abreast of industry developments and influencing its trajectory. This study delves into the evolution of the road

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building sector through the lens of Dansk Vejtidskrift, the preeminent journal for Danish road building authorities, spanning the years 1924 to 2024. In its nascent years, the journal addressed crucial challenges posed by the advent of fast-driving rubberwheeled vehicles. Compounded by the decentralization of road authorities across the country in 1865, with the state relinquishing control to railroads, more than 300 local administrative units faced the challenge of adapting to new technologies, necessitating the widespread dissemination of knowledge. International collaboration played a pivotal role in shaping the journal's content. Participation in meetings hosted by the international organization for road engineers, PIARC, allowed Danish contributors to share experimental findings and best practices from around the globe. Stories about innovations like electric signals and high-speed road construction resonated on an international scale. The journal seamlessly integrated practical experiences from the field with theoretical insights from the technical university and emerging research institutions. As the transportation landscape expanded, so did the depth and breadth of technical knowledge. From the 1970s onward, private companies assumed a central role in national-level knowledge management. Simultaneously, the state established a national road agency to oversee the construction of extensive motorways, prompting the journal to adapt to the evolving landscape. This study is underpinned by an analysis of over 20,000 articles spanning the journal's history, unravelling the topics, authors, and target audiences. The evolution of the journal runs parallel to broader developments in the road building industry and the emergence of alternative communication channels.

Jørgen Burchardt is a senior researcher associated with Museum Vestfyn. He has held the position of director at the Danish Road Museum, and beyond his contributions to museums, he has a portfolio of books that delve into the realms of technology, organization, and life experiences in modern society.

Dimensions of “smart” transformations in the ports of Hamburg and Marseille (Sophia Leipert)

While the star.ng point of the transformations of ports into “smart” ones can be traced back to the first terminal automatization in Rotterdam in 1993, it is only in recent years that these developments have increased both qualitatively and quantitatively. In my doctoral research and this paper, I examine the ports of Hamburg and Marseille and their ongoing discourses and practices of becoming “smart” from a Governmentality perspec.ve – as they’re framed as highly relevant for several reasons. Firstly, they respond to urgent challenges such as adap.ng to (geo-)political changes, competition, and moments of crisis. Secondly, they involve changing logistical practices related to the global circulation of commodi.es and data. Thirdly, they contribute to the reorganization and repositioning of port spaces, e.g., as sites for the production or import of green hydrogen. Using qualita.ve and historical-analytical methods, I examine telecommunication infrastructures and their current transformations in smart port projects.

Sophia Leipert works as a research associate at the Chair for Cultural and Spa<al Theories in the program "Culture Digitalization Metropolis" at HafenCity University Hamburg since April 2023. She studied Architecture (B.Sc.) in Wuppertal and Istanbul, as well as Urban Design (M.Sc.) in Hamburg and Milan. In her master's thesis (2021), she examined infrastructures of digital telecommunications using qualitative-ethnographic and historical-analytical methods. She is currently pursuing a doctoral degree (Dr. phil.) on telecommunications infrastructures in port areas of Hamburg and Marseille, with a focus on modes of governance in urban futures from a materialist Governmentality perspective. For her research, she draws on theory from (urban) geography, Science and Technology Studies, infrastructure history, and political-economic perspectives. Her thematic interests revolve around infrastructures, logistics and planning, as well as urban-political movements. In addition to her academic work and teaching, she hosts a monthly radio show about city development processes, urban theories, and politics in Hamburg.

Transportation Technology: changing the Mobility Landscape in an Urbanized Lagos City (Abiola Esther Olawale, Isreal Abayomi Saibu)

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The city of Lagos, Nigeria, stands as a bustling metropolis, emblematic of rapid urbanization in emerging economies. With a population exceeding 20 million, transportation and mobility challenges have become increasingly complex. This abstract explores the transformative impact of transportation technology on the mobility landscape in urbanized Lagos. From the integration of smart transportation systems to the emergence of ride-sharing platforms, technological advancements are reshaping the way people navigate the city, addressing longstanding issues and offering new possibilities for sustainable urban mobility. Lagos, once infamous for its traffic congestion and inadequate public transportation infrastructure, is witnessing a paradigm shift with the infusion of cutting-edge transportation technologies. The introduction of smart transportation systems in the city of Lagos has brought about a systematic approach to managing traffic flow, reducing congestion, and enhancing overall mobility. These systems leverage realtime data, intelligent traffic management, and advanced communication networks to optimize transportation efficiency, providing a more seamless experience for commuters. Ride-sharing platforms, exemplified by the likes of Uber and Bolt, have emerged as significant disruptors in traditional taxi services. This paper examines the Economic Impacts of Transportation Network Companies on the Taxi Industry; it also explores the economic implications of these platforms. In Lagos, ride-sharing has provided a convenient and efficient alternative for commuters and created economic opportunities for drivers, contributing to the city's evolving gig economy. Electric mobility is another transformative aspect of transportation technology in Lagos. As the city grapples with environmental concerns and air quality issues, the adoption of electric vehicles (EVs) has gained momentum. Analyzing the impact of EVs in the city of Lagos it is observed that EVs not only offer a sustainable solution to air pollution but also contribute to the reduction of dependence on fossil fuels, aligning with global efforts towards a greener future. Moreover, the integration of Mobility as a Service (MaaS) platforms has been instrumental in streamlining the diverse modes of transportation available in Lagos. The potential of MaaS in creating a seamless, interconnected transportation network is

unquantifiable. By consolidating various transportation services into a single accessible platform, MaaS enhances the efficiency of urban mobility, offering citizens a more holistic and user-friendly experience. This paper employs literature search and oral interviews in its data collection. Data collected were analysed using quantitative and qualitative methods. This paper concludes that, the transportation technology landscape in urbanized Lagos is undergoing a profound transformation, redefining the way people move within the city. The integration of smart transportation systems, ridesharing platforms, electric mobility, and Mobility as a Service exemplifies a holistic approach to addressing the challenges posed by urbanization. As Lagos evolves into a smart city, leveraging technology to enhance mobility improves the quality of life for its residents and sets a precedent for other burgeoning urban centres facing similar transportation challenges. This abstract offers a glimpse into the dynamic changes underway, emphasizing the role of technology in shaping the future of urban mobility in Lagos.

Esther Olawale is a postgraduate student with Anchor University Lagos, Nigeria. She is pursuing her Ph.D. in African Studies. She is also a graduate Assistant in the Department of History and International Studies Anchor University Lagos Nigeria. She has attended some conferences where she presented papers on Digital History, Migrations and Environmental History.

Abayomi Saibu holds a Ph.D. in African History from Ekiti State University in Nigeria. His doctoral thesis in African History focused on Beninese labour migrants and their contributions to agricultural development in Ogun State Nigeria 1960-2020. He lectures in the Department of History and International Studies, Anchor University, Lagos, Nigeria. He has published many articles in scholarly journals at both national and international levels. He has also contributed articles in book projects which have contributed immensely to knowledge production. His research area is in the domain of African history with a special interest in the dynamics of migration and culture in Africa, Digital History, Environmental History, Public History and International Economy. He has also participated in several local and international seminars, workshops and conferences where papers were presented. He is a member of the Historical Society of Nigeria (HSN), Lagos

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Studies Association (LSA), Nigerian Institute of International Affairs (NIIA), and a fellow of the French Institute for Research in Africa (IFRA).

The S- and U-Bahn, and the Production of Urban Space in Berlin, 1945–1990 (Hannah Siegrist)

The presentation explores how the S-Bahn and U-Bahn rail transport systems influenced the production of space in Berlin during that timeframe. By focusing on spatial practices, on literary and cinematic representations, and on general visions projected onto the train systems, I examine not only how the train systems in Berlin were part of the ideological Cold War conflict, but also the changing understandings of the systems we have come to refer to as infrastructures. Further, I argue that infrastructures as a concept must be understood against the background of the Cold War. My thesis will be structured chronologically and include a range of case studies. At the Tensions of Europe Conference, I will be presenting the first chapter – which shows how the Soviets used their control over the railway systems to prevent West Berlin's plans to transform the city as a whole into a US-style automobile city – and the last chapter, in which I argue that the 1980s complete explosion in using the term "infrastructure" must be understood in the context of loss of future in the Eastern bloc. This sequence of events is then related to the GDR's sale of the western half of the Berlin S-Bahn system to the West Berlin Senate.

Hannah Siegrist is currently pursuing her Ph.D. in the History of Science and Ideas at Uppsala University in Sweden and has been doing so since the year 2020. In the first half of 2023, she was a visiting PhD student at Leibniz-Zentrum für Zeithistorische Forschung (ZZF) in Potsdam. Her doctoral project is titled "The S- and U-Bahn, and the Production of Urban Space in Berlin, 1945–1990", which explores how the S-Bahn and U-Bahn rail transport systems influenced the production of space in Berlin during that timeframe. The project focuses on the interplay between three cultural entities – East

Berlin, West Berlin, and Berlin as a whole – and the impact of the rail networks on this triad.

2.5 Decline, Change and Ascent. Technological and economical effects on blue- and white-collar employees during 1970s to 2000s

Location: GD 203

The world of work has changed significantly due to technological progress and economic shifts since the 1970s. While discussions regarding deindustrialisation frequently concentrate on the coal and steel sector and the labor force engaged in heavy industry, this panel emphasizes the significance of a broader perspective to consider effects on both blue- and white-collar professions. The panel investigates the repercussions of technological and economic shifts across different industries, encompassing steel, coal, the shoe manufacturing industry as well as effects on the secretarial profession.

The panel's primary objective is to explore the personal experiences of individuals affected by technological and economic change. Technological change does not only refer to the closure of outdated industrial facilities but also to innovations such as the construction of more efficient blast furnaces or the integration of digital technologies in secretarial services, which have influenced career paths and the nature of work itself. The focus lies on understanding the impact of these changes on both blue- and white-collar workers. Each speaker comprehends written sources as well as oral history interviews to explore personal experiences and shifts in work, including organizational structures within companies and strategies to navigate these changes. The evolution of career paths from blue- to white-collar professions is examined, documenting individual experiences and the challenges inherent in transitioning between these spheres. The interplay between technological advancements, societal discourses surrounding these

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innovations, and their effects on specific professions is at the center of interest.

The objective is to establish connections and similarities between different sectors, highlighting the diverse technological and economic effects that have had significant implications for both blue- and white-collar employees. Technological and economic changes have had numerous effects on worker's lives, including experiences of decline, change, or career advancement.

Chair: Stefan Krebs

Always on the Move. German Businesses and their Senior Employees after the 1970s (Christina Häberle)

One of the reasons why German shoe-businesses began to outsource their production was the absence of subsidies for the struggling domestic shoe-production. One of my interview partners stressed that there was no other way than going abroad in the 1980s, if the company should prevail. So, a certain mindset was needed not only to manage the work abroad but also to implement changes at home. Before the outsourcing process some shop floors were usually not further away than an hour from the companies 'headquarters'. But this instant access to production sites crumbled and with this also the organizational structure inside the companies. The senior employee's responsibility increased because they built, organized and controlled the production sites on behalf of the company – their employer. To control their 'partners' proved difficult not only due to language barriers, but also due to other factors like geographical and cultural distance or quality perception.

Christina Häberle is a PhD student at the Leibniz Centre for Contemporary History since October 2021. She is part of the postgraduate research group "Social Consequences of the Transformation of the World of Work in the Second Half of the Twentieth Century" funded by the Hans-Böckler-Foundation. In her project "On the Heels of the World. A History of the German Footwear Industry in the World from 1970 to 2000". She studied history and linguistics at the Technical University Dresden and University of Potsdam.

Between modernisation and closure. Experiences of technological change in Luxembourg's steel industry, 1970-1980 (Zoé Konsbruck)

Technological change in the Luxembourg steel industry in the 1970s and 1980s played a crucial role in driving societal transformations amidst structural change. The restructuring of the steel sector brought about technological changes, including the implementation of modernisation initiatives such as the construction of Blast Furnace C in Belval, as well as the closure of outdated facilities like the Terre Rouge plant. These changes had a profound impact, resulting in a reduction in the industrial workforce and subsequently affecting local communities in industrial towns. Luxembourg shifted from an industry-focused to a service sector-centered economy, posing challenges like job redundancies for steelworkers, altering their identities rooted in the industrial sector. Oral interviews with workers, union members and stakeholders from industrial cities provide the source base to examine these changes – specifically the individual change of industrial location or career change – in more detail.

Zoé Konsbruck is a PhD candidate at the at the Luxembourg Centre for Contemporary and Digital History (C²DH). She holds a bachelor's and master's degree in contemporary history from the Ludwigs-Maximilians-Universität in Munich (LMU). Her research interests include the industrial history of Luxembourg and the history of deindustrialisation with a focus on urban history. Her PhD thesis is part of the project "Confronting Decline: Challenges of Deindustrialisation in Western Societies since the 1970s" (CONDE), which is led by the Leibniz Institute for Contemporary History (IfZ) in Munich and in cooperation with the Deutsches Institut für Erwachsenenbildung (DIE) and the C2DH.

Technological Change and Feminist Emancipation. The Secretary Crisis in the 1980s in West Germany (Nina Neuscheler)

Around 1980, the secretarial profession in West Germany was in a paradoxical crisis: against the backdrop of the threat of the rationalization of work through digital technologies, secretaries feared losing their jobs. At the

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same time, companies complained about how difficult it was to find secretaries to fill vacancies.

While everyday working life and the demands placed on secretaries changed fundamentally through new technologies in offices, sexist clichés surrounding the job description persisted. Female office workers were expected to mother and admire their bosses, to ensure a good working atmosphere and to look good. Against the backdrop of the women's movement, secretaries' organisation openly criticized sexist role models and discrimination in their working environment.

The example of the secretarial profession shows the intersection of several transformations at the beginning of the 1980s: the digital transformation of a genuinely female occupational field, associated threat scenarios and discourses critical of technology in West German society as well as feminist emancipation efforts.

Nina Neuscheler is a PhD candidate at the Leibniz Centre for Contemporary History Potsdam. She studied Political Sciences and Contemporary History at the Universities of Bremen and Potsdam. Her PhD project is part of the Leibniz project "Digital Inequalities. Divides, Hierarchies, and Boundaries in Germany, 1970s to 1990s" and investigates how computerisation of the working world as well as the private spheres altered gendered inequalities in East and West Germany.

Surviving Transformation. Technological progress in the (post)socialist steel industry in the GDR 1985-1995 (Nicolas Arendt)

The dissolution of the Eastern Bloc in 1989/91 led to a significant decline in East German steel production and the closure of many plants, mainly due to low productivity rates and technological deficits compared to new international competitors. However, the Maxhütte Unterwellenborn in Thuringia managed to endure this period, largely by adapting Western technology. First, a technologically advanced rolling mill was installed at the site by the Belgian Cockerill Sambre in 1985, followed by the acquisition and modernisation by Luxembourg's ARBED group in 1992. Oral history interviews with managers and white-collar workers, along with internal

company documents, are used to examine the role of technology in company strategies and workers' perceptions during this transformative period. The paper highlights technological change as crucial to the survival of industry, but also as a trigger for significant job losses. It also reveals the transnational dynamics of technology transfer between East and West.

Nicolas Arendt is a PhD candidate at the Centre for Contemporary and Digital History (C²DH) in Luxembourg working on the TransARB project, which analyses the transformation of the ARBED company in both Western and former Eastern Europe since the 1970s. His research project is supported by the Luxembourg National Research Fund (AFR-FNR PhD Grant) in co-tutelle agreement with the Research Centre for the History of Transformation (RECET) at the University of Vienna. He studied History and Contemporary History at the Universities of Vienna and Strasbourg.

2.6 Food and Health (individual presentations)

Location: GD 204

Values creation and biocultural dimensions of food technologies (Elitsa Stoilova)

In recent decades, historians studying technology developed an interest in the mutual relationships between food, ecology and technology, focusing not only on large industrial technical systems of food production and distribution, but also on mundane food production and consumption (Orland 2005; Østby 2012; Zachmann 2012; Elmqvis and all 2013). The paper focus is on the interrelation of biological and cultural in the construction of the symbolic and technological dimensions of food. If during the twentieth century the active processes were those of food industrialization, devaluation of traditional tacit knowledge and processes of gastrationalism, the popularization of craft beer in the next century explicitly questions those established direction in food production and consumption. It offered new economic and consumption models based on innovative interpretations of traditional technologies and problematized mass production and consumption. Two cases of food, yogurt and craft beer

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will be presented as illustrative for the dynamics between biological and cultural in relation to food technologies. Both cases represent how technological transformations and interpretative shifts toward biocultural paved the way for new production models and technologies, as well for new consumption practices. They reveal the various technological and ideological transfers that shaped international, national and local production, distribution and consumption.

Elitsa Stoilova is an associate professor at the Ethnology Department at Plovdiv University. After defending her PhD on history of technology in the Eindhoven University of Technology on the construction of the national identity of Bulgarian yogurt, she continued working on food studies and identity construction. Her main fields of research are anthropology of food, cultural and identity studies, history and sociology of science and technology, and new interpretation and uses of the intangible heritage. In the last 7 years she has worked on rural food festivals and their specifics in Bulgaria that resulted in a book publication in 2021 (Food Festivals and Celebrations: Valorization of the Local Culinary Heritage). Her recent research is oriented toward craft brewing as an example of neolocal policies and innovative networks of learning and community building.

Framing and Representing Science, Sustainability and the Public Health in Greece: The Social Construction of Olive Oil (Vasiliki Karantzavelou)

This thesis explores the multifaceted nature of olive oil, viewing it not only as a food product but as a materiality reflecting techno-social dimensions, economic values, and cultural aspects. The objectives include studying olive oil's evolution from 1950 to the present to identify the roles of different actors in the formulation of policies and advancements in the olive oil sector, analyzing sustainability, healthiness and quality concepts, examining the roles of experts in shaping the olive oil system production in four significant olive oil production areas (Kalamata, Chania, Lesvos, Magnisia), and what's the interplay between social representations and public discourse. The dissertation's innovation unveils olive oil as a complex system influenced by scientific research, technological advancements, and sociohistorical factors.

The thesis also emphasizes the varying perceptions based on academic expertise, experiential knowledge and lay representations, which contribute to the shaping of a multiplicity of meanings for a cardinal food product.

Vasiliki Karantzavelou is a Ph.D. candidate in the Department of History and Philosophy of Science at the National and Kapodistrian University of Athens. She is engaged in researching the social construction of olive oil in Greece, employing archival materials and discourse analysis from stakeholders. She earned her B.A. in Philosophy, Pedagogy, and Psychology from the National and Kapodistrian University of Athens, a M.Sc. in Social Psychology of Conflicts from Panteion University of Social and Political Sciences, and a M.A. from the STS Interdepartmental Program at the National and Kapodistrian University of Athens. Her research interests include the social construction of food, risk conceptualization, qualitative research, expertise and the application of a social representations approach in Science and Technology Studies (STS). For the past two years she has been participating in CONEF, focusing on the configuration of environment and food in the agri-food sector in Greece.

Metagenomics and Microbial Ecology: Transforming Scientific and Healthcare Practices (Sylvain Lallier)

Studies of animal microflora conducted by INRA (France) since the 1960s highlighted the consequences of the destruction of the ecological barriers of the gut flora by antibiotics. Gradually, research on host-microorganism interactions has seen the development of microbial ecology, and a molecular approach technique, metagenomics. This technique identifies the genes of micro-organisms present in an ecosystem. Since 2000, the number of research projects using this technique nationally and in Europe has increased significantly. This phenomenon has led to the integration of the microbiome concept into many laboratories in human health, connected by high-throughput sequencing platforms and metagenomic data production. This trend in research funding has also steered funders and industrial firms towards strengthening the biopharmaceutical sector.

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Anthropology of knowledge and STS portray the microbiome as bearing the biological mark of social health inequalities, redefining the boundaries between social and biological sciences. More recently, researchers note a ‘microbial turn’ to characterise this shift in the perception of human-microorganism relationships induced by the advent of metagenomic techniques. Drawing from a socio-ethnography of French research laboratories and high-throughput sequencing platforms, this paper asks: How metagenomic approach, a clear example of technology-driven scientific, political, and economic change, concretely affect laboratory and healthcare practices?

This paper will outline the transnational and local emergence of human health projects involving metagenomics, starting with the European METAHIT project (2008-2012) coordinated by INRA. It will detail research funding, technique-related controversies, and the promises of application as a transformation of traditional health and disease concepts. Then, the paper will explore the impact of metagenomics on scientific and multidisciplinary work, including how computational reasoning from metagenomic data influences experimental models, and its effects on clinical practices and public health, particularly the potential in diagnosis, using personalized preventive nutrition as a case study.

Sylvain Lallier is a PhD candidate from University of Paris, affiliated at Centre de recherche Médecine, Science, Santé, Santé mentale et Société (Cermes3) and Centre d’histoire des sciences et des techniques AlexandreKoyré (CAK), my thesis focuses on the scientific work concerning the study of host-microorganism interactions (microbiome) through a socio-ethnography of laboratories in human, animal, and plant health, microbiological resource centres, and high-throughput sequencing platforms in France.

Datafication from Precision Medicine to Health Databases: Histories of National and Transnational Initiatives and Discourses (Eleni Chatzimichali, Katerina Vlantoni)

From precision medicine (also known as ‘personalized medicine’) to health policy, the drive for datafication has been central to the recent history of

biomedical science and technology. This drive has been supported by state initiatives at the national level. Key to such initiatives has been the availability of sizable and complex technological infrastructures, from data-rich national biobanks to transnational health databases, including EU ones. Our paper introduces to the history of two relevant cases. We start with a history that compares national initiatives and discourses for promoting biomedical research for precision medicine in Greece and Germany (Chatzimichali), based on primary research on relevant medical and media articles. We then move to the history of European research infrastructures, focusing on the emergence of the BBMRI-ERIC one, which aims at the networking of biobanks (Korsgaard, Vlantoni). In this case, we pay attention to the history of discourses and initiatives that led to the recent EU proposal for the creation of a European Health Data Space and the EU4Health Program. Central in this history has been the interplay between national and transnational initiatives and the discourses that have defined them. In this case, our primary sources are, predominantly, relevant reports and related documents.

Eleni Chatzimichali is a Doctoral Candidate at the Department of Biomedical Engineering, University of West Attica. She holds an MSc in ‘Science, Technology, Society – Science and Technology Studies’ from the National and Kapodistrian University of Athens (Department of History and Philosophy of Science & Department of Informatics and Telecommunications). She writes her dissertation on a comparison of the emergence of precision medicine in Greece and Germany.

Katerina Vlantoni was recently elected assistant professor at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens. She is the Principal Investigation of the postdoctoral research project *BIO-CONTEXT: Contextualizing biobanking in Greece: histories, practices, discourses*, funded by the Hellenic Foundation for Research & Innovation. She has worked as adjunct faculty at the Department of Biomedical Engineering, University of West Attica, and at the Department of History and Philosophy of Science, National and Kapodistrian University of

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Athens. She specializes in the historical and STS study of medical/biomedical science and technology.

12:30-13:30

Lunch break

Location: GD Mensa

13:30-15:00

3.1 Towards sustainability of global resources, fair trade and global justice? Experiences, challenges and narratives of transformation (III)

Location: GD Hs3

Climate change, rising resource competition and global inequality pose tremendous challenges to contemporary societies around the globe and urgently require fundamental processes of transformation to sustainable practices and global justice. Proxy and local wars as well as numerous political and economic tensions make modern development even more risky and complicated. These transformations require significant technological, institutional and cultural innovations and the creation of societal acceptance to such innovations. Historical research contributes valuable knowledge about the complexities, conflicts and impediments of such transformations as well as experiences of successful cases and best practices.

This panel will offer historical research about cases and examples in all relevant domains around the globe. Topics of interest comprise historical cases of technology and transformation in resource extraction, distribution, availability and consumption, for example in the development and use of natural resources, energy transition, mobility turnaround, shifts in production, changes in consumption etc. The panel has goal to enable

comparative discussion of local and global narratives about this transformation and the versatile roles of technology in it.

Organizers: Matthias Heymann, Elena Kochetkova

Blue economy and environmental justice: how fish migrations complicated the picture (Julia Lajus)

This paper discussed the situations of injustice in availability of marine resources that are caused by migrations of commercial species responding to changing climate. Migratory nature is a fundamental characteristic of many commercially important aquatic animals, and climate changes are among the main drivers changing the migration patterns. The patterns may change that way that one particular country or group of countries gains an advantage of more abundant or more easily accessed fish resources at the expense of the other. Also, climate change could redistribute resources in that way when particular groups, for instance Indigenous or local coastal communities which do not have well-developed technology or economic means for offshore fisheries lost the access to the resources. I also considered justice that includes the non-human actors - multispecies justice, i.e. considering needs of all species in ecosystem and how it could be implemented in a framework of an ecosystem-based management. Paper is based on historical examples from the northern waters, predominantly the Barents, Norwegian and the Bering seas.

Julia Lajus is currently a Visiting Associate Professor at Columbia University in the City of New York and an Associate Researcher at the University of Helsinki. In 2022 she was a visiting researcher at Max Planck Institute for the History of Science in Berlin. Before spring 2022 she was the Head of the Laboratory for Environmental and Technological History and Associate Professor at the Department of History, National Research University Higher School of Economics (HSE), St. Petersburg, Russia. In 2011 – 2015 she served as vice president of the European Society of Environmental History. Her research focuses on the history of field sciences and the environmental history of natural resources, especially in marine and polar areas.

Indigenous epistemology versus big mining in Columbia and Ecuador
(Eduardo Erazo Acosta)

This article investigates the conflicts experienced by indigenous communities in Colombia and Ecuador due to large mining projects in their territories and the impacts of climate change, such as the melting of glaciers, severe droughts, seasonal changes for food production, scarcity of water etc. With our ethnographic research developed over more than 7 years, we will show how these developments collide with the indigenous epistemologies of *Sumak Kawsay* (in the Kichwa language: *Buen vivir*) and the practices associated with it. *Sumak Kawsay* is a strong spiritual foundation that teaches respect for nature, a worldview with solidarity economies, personal rights and collective health, and educates for an alternative path to development and pluriverse. *Sumak kawsay-Buen vivir* represents a multidimensional, holistic proposal in a time of climate change giving the opportunity to participate actively in an alternative development that addresses dimensions such as the spiritual, political, economic, educational and family.

Eduardo Erazo Acosta is sociologist and member of the Research Group "Curriculum and University" attached to Colciencias. Universidad de Nariño, Colombia. He has experience of 14 years' research on social movement's, politics, violence in the Andean region with particular interest in decoloniality, human rights, Andean ancestral thought, social movements and Sumak Kawsay. In 2013 he received the Distinction as a young essayist within the framework of the Nobel Peace Prize awarded jointly by the Ministry of Science and Higher Education, the Institute of Applied Social Sciences of the University of Warsaw.

Vanessa Arteaga is a philosopher and cultural manager. She is a researcher in indigenous worldviews and pluricultural epistemologies of indigenous groups of Ecuador-Colombia. She has 7 years' experience in working with indigenous and peasant children in ethnic literacy.

Resources and their discourses: From 'soft energy' to 'renewable energy sources' (Panagiotis Kazantzias, Antonis Kechrimparis, Aristotle Tympas)

Building on what ToE-related scholars have so far contributed in regard to the history of resources, the presentation invites attention to how the concepts 'resource' and 'source' are socially constructed. To do so, it focuses on what by now exemplifies the hopeful passage/transition to sustainability, namely the social appropriation of the wind and the sun for energy purposes. Based on ongoing research on the history of discourses on engineering and other media, covering the period from the 1960s to the present, we argue that there is much to be learned by the study of the conceptual change from talking about 'soft energy' or 'alternative energy paths' (1960s to early 1990s) to talking about 'renewable energy sources' (late 1990s to the present). More specifically, we argue that the reference to 'soft' or 'alternative' energy was pointing directly to wind/solar energy technology that would be the opposite of the traditional industrial scale technology for energy generation and the long-distance transmission network assumed by it. By contract, the reference to 'renewable energy sources' shifts the attention away from the reproduction of this industrial scale technology through giant wind farms and solar parks. As a result, it shifts the attention away from a whole range of resources that are also indispensable for these giant farms/parks, like special metals and other materials that become available through the emergence of a neo-extractivist regime, similar to the one supporting the traditional extraction of fossil fuels.

Panagiotis Kazantzias is PhD Candidate at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens.

Antonis Kechrimparis is PhD Candidate at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens.

Aristotle Tympas is Professor at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens.

3.2 Datafying the environment, environmentalizing data 3: Data and governance

Location: GD Hs8

ToE24 – programme overview (page 1-3) and detailed programme (page 4-85)

Over the last decades, the environment and its governance have undergone a transformation towards progressive datafication. Environmental goals, indicator systems and performance reviews build on the availability of environmental data. As the environment becomes “datafied”, data become increasingly “environmentalized” – as proxies for the environment itself or currencies in environmental discourses. This ongoing transformation has become so comprehensive that scientific, political and economic knowledge about the oceans, the atmosphere, the land surfaces and the ice, and their governance, today rely on vast flows of data gathered, made evident, shared and consumed through a myriad of tools. Concepts such as “enviroming media”, the “digital climate/digital environment” or the “mediated planet” have been proposed to capture the epistemological, political, social and environmental implications of such transformation.

This panel series features empirical cases and examples that research on the history of the people, their technological, professional and institutional resources, their forms of organization, the power relations that go with them, and the perceptions that enable to generate, negotiate, disseminate, maintain and consume environmental data. The focus will be on environmental monitoring and sensing tools and operations in a broad sense. The aim is to gain understanding about the politics, epistemologies, technologies, vulnerabilities and social norms that made environmental data available and even vital for science and policy.

Organizers: Gemma Cirac-Claveras, Sabine Höhler

Chair: Sabine Höhler

Capturing Exposure: How insurers use high-resolution aerial data of the built environment to constrain the costs of protection (Ian Gray)

Facing increasing losses from climate-fueled natural hazards, property and casualty insurers in Europe and the U.S. are actively expanding their spatial and material knowledge of the objects they insure. More comprehensive information about the built environment helps them better estimate damages from present and future disasters. To gather this knowledge, insurance companies are turning to innovative third-party vendors who use

optical imagery from public and private satellites, radar and LIDAR technology, and techniques in computer vision, to develop before-and-after imagery of areas affected by disasters. This data feeds back into how insurers classify exposure and how they assess the physical vulnerability of structures and communities in particular geographies. What used to require the painstaking work of on-the-ground adjusters is increasingly in the hands of algorithms and aerial imagery. This paper looks at the data collection, storage, and calculation practices of this emerging set of companies. Working at the interface of knowledge about the natural and built environments, I argue that this data profoundly alters how risk is seen and transferred between insurance companies and those who pay for their protection.

Ian Gray is an economic sociologist and science and technology scholar. Presently a Postdoctoral Research Scientist at the Columbia Climate School, he holds a PhD in sociology from the University of California, Los Angeles.

“You can’t manage what you can’t measure”. Satellite data and climate governance in the European Copernicus programme (Dorian Groll)

Satellite data are routinely used for research purposes, but a long-standing discourse originating from the space sector has emphasised their potential for so-called “operational” uses for environmental management, through climate services and decision-making tools. Throughout the last forty years, satellite data have therefore been incorporated to the toolbox of climate governance, together with a number of assumptions regarding their malleability and neutrality, the possibility to manage climate as a technical problem and the influence of data and knowledge on policy-making. Based on the analysis of archival documents from European institutions, interviews and participant observation in an agency that collects, produces and shares satellite data, this presentation will focus on the European Earth Observation programme called Copernicus and delve into its history, infrastructures and data practices in relation to climate governance.

ToE24 – programme overview (page 1-3) and detailed programme (page 4-85)

Dorian Groll began a PhD in January 2023 on the use of satellite data for climate governance after a curriculum in social sciences and environmental law and two years working at the French space agency.

From global to local, the emergence of local metrology in soil carbon sequestration (Robin Leclerc)

Soil carbon sequestration is rapidly rising as a potential solution to slow down climate change, especially when integrated in offset carbon markets. Alongside these markets, a much less investigated policy route for soil carbon sequestration is its integration in local climate policies. The aim of this paper is to unpack the issues and stakes at play in the production of soil carbon metrologies and data for local climate policies. Relying on two case studies, La Rochelle and Grenoble in France, this paper shows that local administrations become the meeting point of different types of soil carbon data. The importance of the agricultural sector in their production and dissemination is underlined. It then shows how the alignment of these data with policy objective and instruments depends on the technical specificities of the data used, but also their potential for rebranding already existing actions in accordance with a new climate framing.

Robin Leclerc is a PhD candidate at LESSEM (lab) INRAE (France) interested in the role of quantification in structuring a soil carbon policy, between the national and the local level of public action.

Opening the Black Box of the European Climate Satellite Data (Grigoris Panoutsopoulos)

During the 1980s and 1990s, discourses regarding climate began to assume increasingly significant roles in the domains of science, policymaking, and global diplomacy. This presentation aims to explore how the European climate narrative evolved through the production, distribution, and use of satellite data, with a specific focus on two prominent European meteorological initiatives: the EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites) and the ECMWF (European Centre for Medium-Range Weather Forecasts). Examining these two organizations

in parallel raises several compelling questions: What differences existed in terms of their artifacts, expertise, practices, methods, strategies, and rhetoric? To what extent did they manage to find common ground, and what power dynamics came into play during this interaction? Furthermore, how did their scientific and technological agendas align with the broader political landscape? In this way, by opening the “black box” of satellite data and investigating in detail how they have been collected, analyzed and disseminated, opens up space for studying how science, technology and diplomacy were intertwined, even at a “nuts and bolts” level.

Grigoris Panoutsopoulos holds a Ph.D. in the History of Science from the University of Athens. Currently working as a postdoctoral researcher at the Universitat Autònoma de Barcelona.

Disaster risk and more-than-human computation: The role of sentinel species in early warning and response in Ghana’s climate change adaptation (Alena Thiel)

How can we take good decisions in contexts of radical uncertainty? This paper traces Ghanaian professionals’ commitment to early warning and accelerated intervention in recent incidences of flooding in Ghana. Drawing on an ethnographic and STS-informed method set, it provides an account of the production of anticipatory knowledge for disaster preparedness and early response mechanisms. Classic STS debates have cemented our understanding of the co-constitution of knowledge infrastructures with interrelated practices. True to this intellectual tradition, the paper foregrounds the invisible “backstage” (Star and Strauss 1999) practices of modelling emergencies under conditions of multiple, layered uncertainties. Specifically, it explores the collaboration between humans and sentinel species –and here, observations of insect behaviours in particular –as manifestations of the “environmentalization” of data in moments of high-stakes decision making.

Alena Thiel is a Marie Curie Fellow at IT University Copenhagen, Technologies in Practice Research Group. Her project “MUNDI -Managing Uncertainty in Disaster Risk Reduction” explores the acceleration of

anticipatory knowledges for early warning and response in contexts of natural disaster in Ghana.

3.3 Transitions and Transformations in Energy History 3: Transformations of Petrocultures and Petroleum Producers

Location: GD 102

It has become common for energy historians to relate their work to contemporary debates and view historical changes in energy production, conversion and consumption through the lens of “transition”. As several historians have pointed out, however, history has not necessarily consisted of radical “transitions”, but often rather “additions” of new energy carriers and conversion technologies, or more gradual “transformations” of the prevailing energy constellations. Organized by the ToE energy history group, this panel series presents diverse case studies to inform discussions about transitions and transformations in energy history.

Each in their own way, the papers provide fresh interpretations or uncover underexplored histories of energy. They question common assumptions and apply innovative approaches to the study of energy technologies as well as socio-technical continuity and change. Rooted in history of technology, they build bridges to political history, business history, environmental history, social ecology, and STS. By highlighting the question of transitions and transformations, this panel series will both inform the conference theme and provide new perspectives on energy history.

Organizers: Uta Hasenöhr, Odinn Melsted, Jan-Henrik Meyer

Chair: Jan-Henrik Meyer

Petroculture in Hiding: The Invisibilisation of Oil in Swedish Energy Policy (Anna Åberg)

Sweden has prided itself on being able to transform from one of the most oil-guzzling countries per capita in the early 1970s, to a practically oil-free

electricity system leading to comparatively low territorial pollution in the 1990s. This transformation led to the oil issue in principle being declared solved in Swedish energy policy. Meanwhile, oil is a pervasive resource, and many of the activities that are seen as the pinnacle of a good life in many societies, including in Sweden (for example travel, consumption of artifacts, food and media) still presuppose the burning of fossil fuels. In fact, Sweden is among the worst offenders in terms of non-territorial pollution per capita. What can we make of this dissonance between the existing materiality of Swedish oil consumption and the lack of oil in Swedish policy narratives? How has such an invisibilisation of Swedish everyday use of oil developed over time?

Anna Åberg is a senior lecturer at Chalmers University of Technology in Gothenburg, Sweden. She is a historian of technology, with a focus on energy- and resource history, and narratives of science and technology in popular culture. Her research themes have spanned oil, natural gas and fusion research, through Swedish uranium import, deep sea- and space mining, and narratives of energy and the environment in popular culture. She defended her PhD thesis on the history of natural gas in Sweden at the KTH-Royal Institute of Technology. Her current research concerns Swedish oil history and is carried out in two projects funded by the Swedish Energy Agency and the Swedish Research Council for Sustainable Development (FORMAS). These projects are a collaboration between Chalmers and KTH, and aim to describe how a Swedish culture of oil use was established, and what lessons can be learned for a new transition, this time to renewable energy. The group also wants to uncover the current cultures and practices stemming from this oil culture.

From Oil to Energy? Transformative Scenarios and the Diversification of the Oil Industry in the 1970s (Odinn Melsted)

In the 1970s, international oil companies invested heavily in solar, nuclear, geothermal and other alternative energy technologies. Enabled by high oil earnings, oil companies became key investors and innovators in alternative energy, before they re-focused on oil in the late 1980s. Those investments

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were often framed as a diversification of the business portfolio from oil to energy, and motivated by scenarios of an impending oil shortage. In this paper, I will examine the cases of Shell and Gulf Oil, which pioneered the forecasting method of scenario planning, and the collaborative study Workshop on Alternative Energy Studies (WAES) at MIT. In doing so, I will evaluate inasmuch the oil company scenarios of a future with less oil were *transformative* and influenced decisions at the time, and whether the diversification of the oil industry represents the beginning of a (failed) *transition* away from oil, or rather a gradual *transformation* of incumbent energy constellations.

Odinn Melsted is a postdoctoral researcher at Maastricht University in the “Managing Scarcity and Sustainability” project about the oil industry and its ties with environmentalism and alternative energy during the 1970s. He obtained his doctorate from the University of Innsbruck in 2020 with the dissertation “Icelandic Energy Regimes: Fossil Fuels, Renewables and the Making of a Low-Carbon Energy Balance”. He is one of the coordinators of the energy history working group of the Tensions of Europe network.

An Unexpectedly Smooth Transition: How (And Why) Petroleum Engineers Transformed Themselves Into Ardent Environmentalists (Greece, 1979-2023) (Christos Karamatsos)

Carbon Capture and Sequestration (CCS) schemes are thought to be the most realistic of the methods proposed to mitigate climate change. They consist of three stages: (a) capturing carbon dioxide (CO₂) from industrial emissions, (b) transporting CO₂ and (c) storing CO₂ in geological formations. All CCS stages have an interesting genealogy that can be traced back to the 1970s state-of-the-art petroleum engineering research, namely (a) Catalytic methods used in oil refineries, (b) Fluid transport via pipes (c) Methods of enhanced oil recovery. My presentation traces this genealogy in Greece. I follow the research of Greek petroleum engineers who returned to Greece from the U.S. in the late 1970s. I show how “environmental concerns” gradually entered their work without altering its fundamental principles. I argue that CCS and hydrocarbon exploitation often remain one and the same

process, though their relation is hidden behind a complex web of scientific and political discourse.

Christos Karamatsos is an Adjunct Professor at the University of West Attica, Greece. He has received an integrated master (MEng) degree from the Department of Mechanical Engineering, National Technical University of Athens. Later on he received MSc and PhD degrees from the Department of History and Philosophy of Science, National and Kapodistrian University of Athens. Between 2018 and 2022, Karamatsos has studied the history of oil exploration in Greece in the context of two consecutive research programs. His latest (co-authored) publication is “The endless potentiality: A century and a half of Greek oil aspirations (and what often becomes of them)”, *Journal of Energy History*, no 10, 2023. He currently studies the history of petroleum and environmental engineering since the 1970s.

3.4 Climates of Waste (round table)

Location: GD 202

Our modernity is characterized by the ubiquity of waste. Industrial processes, communication tools, means of transportation, patterns of consumption, and societal organizations writ large are bound to the productions of residuals, discards, surpluses. Some of them are absorbed by the planet’s continuous biogeochemical cycle, or just surpassed by historical evolution. Most of them keep hunting us—impacting both the human and more-than-human worlds, endangering ecological balances, impinging on planetary systems, and unearthing inequality—and scholars have attended to their consequences and legacies, both material and immaterial, of a waste-filled world. Indeed, as Gabriele Hecht suggests, waste production can be regarded as the direct “apotheosis of the Anthropocene,” since marginalized groups and minorities are often unevenly exposed to and unequally impacted by the quantity, toxicity, and durability of human-created castoffs. The unaccountable overproduction and uneven distribution of waste has become a structural reality of affluent societies and an insurmountable liability for underdeveloped ones. Modern imperatives of technological

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progress and economic growth have, with their never ceasing production of waste, disproportionately harmed the disposed and marginalized. Yet human-induced climate change and the triumph of global interdependence threatens more and more people's lives and livelihoods, with waste inequalities likely set to exacerbate and expand in unprecedented and inescapable ways in the years to come. How can we therefore reckon with the damages of our past and current, material and immaterial, widespread waste landing? How can we envision a future built on justice, equity, and sustainability yet permeated with waste production? What we do and do not know about societal norms, cultural legacies, economic systems, political challenges, ideological motivations, and power relations that can help us reframe the relations between waste, contamination, and justice in a climate-changing world? This roundtable attempts to shed light on such questions, bringing together participants who have a variety of disciplinary, geographic, cultural, and institutional perspectives.

Participants: Aparna Agarwal, Ayushi Dhawan, Dario Fazzi, Sebastian Lundsteen, Simone Müller

Moderator: Elizabeth Hameeteman

Elizabeth Hameeteman is a Postdoctoral Researcher at the Technische Universität Berlin. She earned a PhD in History from Boston University. Her dissertation, titled "Pipe Parity: Desalination, Development, and the Global Quest for Water in the 1950s and 1960s," explored the role of desalination as a seemingly viable adaptation strategy to reduce the impact of water scarcity and climate variability in the post-WWII period. Elizabeth has a background in Law and American Studies, and is also the founder of *Environmental History Now*, an award winning online platform that showcases the environment-related work and expertise of graduate students and early career scholars who identify as women, trans and/or non binary people.

Aparna Agarwal is an Assistant Professor in the School of Government and Public Policy, O.P. Jindal Global University. She completed her D.Phil. from the Department of International Development at the University of Oxford. She has a BA (hons.) from University of Delhi and a M.A and M.Phil.in Political

Science from Jawaharlal Nehru University. Her research interests lie in the fields of urban sociology, waste studies, labor studies, anti-caste studies, political ecology, and Indian politics. She is currently working on perceptions of the environment around waste sites in Delhi.

Ayushi Dhawan teaches environmental history at Azim Premji University, Bhopal. She earned a doctorate in Environmental Humanities from the Rachel Carson Center/LMU Munich. Her research focuses on the history of Alang shipbreaking yards in Gujarat, hazardous waste trade, social inequalities, scrap recycling, and environmental activism in India from the 1980s until early 2007. Her work sits at the intersection of environmental humanities, environmental justice, and environmental history. Dhawan has published her work on the Alang shipbreaking industry in peer-reviewed journals, and book chapters, and has written for various blog posts, including pieces in *Pipe Wrench Magazine*, *Vigia Magazine*, *Seeing the Woods*, *Kunsthal Extra City #Cahier 5*, and *Environmental History Now*.

Dario Fazzi is Professor of Transatlantic Environmental History at Leiden University the Roosevelt Institute for American Studies in Middelburg. He has published extensively on transatlantic crossings, U.S. global base politics, and anti-toxics campaigns. His works on anti-nuclear activism include several reviews, essays, and book chapters, along with his first book, *Eleanor Roosevelt and the Anti-Nuclear Movement: The Voice of Conscience* (Palgrave, 2016). Fazzi's studies on the socio-ecological impact of the U.S. empire, and in particular its military-industrial complex, have resulted in the publication of essays on U.S. installations in Europe and on his last book, *Smoke on the Water: Incineration at Sea and the Birth of a Transatlantic Environmental Movement* (Columbia University Press, 2023).

Sebastian Lundsteen is a PhD candidate at the Greenhouse - Centre for Environmental Humanities based at the University of Stavanger. His work sits between environmental history and anthropology with a focus on industrially produced chemicals including chemical waste. He approaches such topics through an environmental justice lens and places the field in a Nordic regional context.

Simone Müller is a global historian of technology, economy, and the environment with a particular focus on globalization processes, the intersection of ecology and economy, and the era of the Anthropocene. Her research interests range from the international trade in hazardous waste material and toxicity as a historical construction, the intellectual history of economic ecological thinking, to verticality as an enviro-historical concept and the study of marine space. Müller's research has received numerous awards and fellowships, among them from the Smithsonian Institution, the Science History Institute, and the University of Pennsylvania. Her most recent book, *The Toxic Ship*, has been published 2023 as part of the Weyerhaeuser Series in Environmental History of the Washington University Press.

3.5 Environment (individual presentations)

Location: GD 203

The High Tatras as a laboratory of modernity in the 20th century (Michal Ďurčo)

During the 1960s, the Czechoslovak Socialist Republic, as part of the Eastern Bloc, gradually emerged from international isolation and began to open up to foreign tourists. The number one tourist destination became the High Tatras. Technocrats wanted to carry out experiments and megalomaniac plans to transform nature into a tourist landscape. New car roads, campsites, cable cars, and hotels were built. Some futuristic technologies such as Alweg monorail were planned. After the FIS Nordic World Ski Championships in 1970, however, the technocrats came into open conflict with scientists and environmentalists, who pointed to the irreversible destruction of the natural environment of the High Tatras and Štrbské Pleso. Scientists warned against similar projects in national parks and started talking about sustainable tourism. Which technologies should have made the High Tatras a world-class sports and tourism centre and what is their legacy today?

Michal Ďurčo works as a researcher at the Institute of History of the Slovak Academy of Sciences in Bratislava. At the same time, he has been working in

the Czech Republic on projects at the Institute for Contemporary History of the Czech Academy of Sciences and at Charles University in Prague. He specializes in the history of science and technology and environmental history in the Central European region. He is the author of the monograph "Roads and Highways in Slovakia in the Interwar Period" (VEDA, 2020) and co-author of the book "Automobilism in Slovakia in the First Half of the 20th Century" (KAROLINUM, 2022). He has completed research and study stays at Charles University in Prague, LMU in Munich and Eindhoven University of Technology. Since 2022 he has been the chairman of the Section for Environmental History in the Slovak Society of Historians. He has been a member of Toe Early Career Scholars since 2020.

Joining the Dnieper Cascade. An Envirotechnical Water-History of Chernobyl Nuclear Power Plant, 1950-1986 (Achim Klüppelberg)

Chernobyl was built at the northern tip of the Dnieper Cascade – a vast industrialisation effort comprising six hydropower plants and their respective reservoirs. While the plant brought nuclear power to Ukraine, the construction of the station was based on experiences and knowledge gained during the construction of those six stations. As nuclear energy was embedded into a sociotechnical imaginary of progress, the success or failure of the plant was in the hands of non-nuclear workers, artisans, technicians, and operators. A *shock of the old* (Edgerton) was more often found at the site rather than the breaking innovation of nuclear power. The knowledge transfer from hydro to nuclear power was key at the construction site of the early 1970s. Concrete and water, mundane building technologies, mass mobilisation and the attributes of the planned economy characterised the construction site of this nuclear giant.

This presentation investigates how Chernobyl was built, but not in a conventional way. Instead, it will consider how the envirotechnical system of the Lower Dnieper basin was renegotiated by adding a nuclear facility to the Dnieper Cascade. Through the realisation of the Kiev Hydropower Plant and thus the creation of its vast reservoir, the envirotechnical system of Kiev Province changed profoundly. Through the addition of the nuclear power

plant, it was further developed into yet something new, combining established hydropower expertise with futuristic nuclear experimentation on the domestic RBMK and All-Union nuclear know-how. This led to a technocratic reshaping of a unique envirotechnical system that enabled the industrialisation of agriculture in southern Ukraine's steppe lands, industrial growth in major cities, and the creation of base load and steering capacities of the whole electricity grid. The recent destruction of the Kakhovka dam in June 2023 took this infrastructural development to headline media, underscoring the importance of understanding its implications.

Achim Klüppelberg is a PhD-Student at the Division of History of Science, Technology and Environment at KTH Royal Institute of Technology in Stockholm, Sweden, and part of the Nuclearwaters-Project (ERC Consolidator Grant), headed by PI Per Högselius.

Waste recycling, plants and animals in the early Soviet waste regime (Tetiana Perga)

This report aims to demonstrate the interconnectedness of waste, plants, and animals within the early Soviet waste regime, which we attribute to the period between WWI and WWII. From the very outset of its formation, the Soviet Union embarked on a large-scale effort to collect various types of waste, which were considered valuable additional raw materials for various industrial sectors. This was driven by a severe scarcity of resources in both the 1920s and 1930s. The primary objective of utilizing waste materials was to provide raw materials for the production of consumer goods. However, plans for waste collection were consistently not fulfilled, prompting Soviet experts to develop various waste substitutes, drawing upon the resources of flora and fauna. For instance, experiments were conducted to replace horsehair (used in brush production) with various plants, and instead of the hides of domestic animals (used in the footwear and leather goods industry), the hides of various fish, frogs, dolphins, and sharks were employed. Skins from cats, dogs, hamsters, and many other animals were also extensively utilized for domestic and export industrial needs. Through an analysis of this practice, we will illustrate how the shortage of various raw materials,

especially waste materials, shaped the discourse and technologies related to the utilization of flora and fauna resources for the production of consumer goods and the attainment of the economic and political goals of the Soviet regime in the 1920s and 1930s. The ideas presented in this paper will be exemplified using the case of the Ukrainian SSR, which was one of the most developed Soviet republics within the USSR following the RSFSR. This study is based on documents from Ukrainian archives that have hitherto remained unexplored and outside the realm of academic discourse, as well as Soviet scientific and popular scientific literature from the interwar period.

Tetiana Perga is a leading researcher at the State Institution "Institute of the World History of the National Academy of Science of Ukraine" and received her Ph.D. degree from Kyiv State University named Taras Shevchenko, Kyiv, Ukraine in 1998. She is a DAAD fellow in IOS Regensburg, Germany (2018), a DAAD fellow at Heidelberg University, Germany (2022), Volkswagen Foundation research fellow at Heidelberg University (June 2022-May 2024). She is a member of the European Society of Environmental History (ESEH), a member of Leo Baeck Institute Jerusalem Research Group in Jewish environmental history, an expert of the Ministry of Education and Science of Ukraine, a member of editorial boards of Ukrainian scientific journals American History and Politics. Academic Journal and European Historic Studies: Academic Journal. Tetiana Perga is a participant in many international conferences and an author of 140 articles, co-author of 8 books, and author of 2 individual books that focused on different aspects of environmental history. Her main research field is environmental history.

Database technology and European scientific environmentalism. The first ecological forest inventory of Catalonia in the Spanish transition to democracy and its integration in Europe (1988-2004) (Max Bautista Perpinyà)

The Ecological and Forestry Inventory of Catalonia (*Inventari Ecològic i Forestal de Catalunya*, IEFC) was the flagship project of the newly founded Ecological and Forestry Applications Research Centre (CREAF) in Barcelona. It was Catalunya's first ecological forest inventory, led by ecologists who saw

themselves as critically responding to the managerial, centralist, and productivist forest engineering that characterised the forest policy during Franco's dictatorship. CREA as an institution and the new map of Catalunya's forests were founded upon the values of a socially responsible, democratic science of ecology, and was part of the new Catalan nationalism. Based on archival documentation and a nascent oral history collection, this paper tells the story of the institutional rise of terrestrial ecology and the technical and political difficulties of making the IEFC database: putting it together, making it useful, and integrating it with other databases. The IEFC feed from "new ecologic data" of forests beyond timber and was consciously designed to track the effect of climate change on European forests. CREA saw the IEFC as a way to integrate democratic, Catalan science into the science and nature of Europe, bypassing the Spanish state. Here, technical terms like root biomass and bush species (deprecated by the Spanish state foresters for being not directly related to timber production) became tools to integrate Catalonia's ecology into the construction of an environmentally conscious Europe. An important function of the IEFC database provide a "radiography of the Catalan forest's health" by giving a probability of forest fires in the face of drought. Thus, the challenge was integrating several classification systems: forest ecology, land use, fuel substances, and flammability models. Additionally, the IEFC was integrated with the Spanish Ministry of Agriculture's own forest inventory, where tensions between the Spanish state and the Catalan region were apparent, often coded in technical language.

Max Bautista Perpinyà is a PhD candidate in the History and Philosophy of Science, based in UCLouvain (Belgium). He is working on the topic of scientific environmentalism during the political transition from Francoism to democracy, particular interested in debates around forest biodiversity conservation.

3.6 Enlightening transformations through histories of technology (I)

Location: GD 204

As transformation agendas become fixated on the future and the opportunities and perils it poses, there is an urgent need to draw on the experiential resource of the past to help navigate the global challenges we are encountering. Whilst lip-service is frequently paid to "learning from the past", history is rarely mobilized with intent to provide guidance, context or correction. There is little systematic research on how historical knowledge really matters to practitioners, whether policy makers, business leaders, civil society groups or individual citizens. The effectiveness of efforts to inform current debates through historical reflection is poorly understood.

The purpose of this double session is to explore the current and potential contribution of the history of technology to render historical knowledge relevant to socio-ecological transformations. The first session will present, with inputs from four contributors, state-of-the-art research on the topic. Issues addressed include drawing lessons from past transformations, challenging assumptions about the transformative capacity of innovations, imagining infrastructures in past and present, and exploring knowledge transfer over time. The second session will focus on methods of mobilizing, co-producing and communicating histories of transformative value. Two introductory inputs will unpack what usable infrastructure pasts can mean and how histories of technology can be used and abused. Subsequently, interactive formats involving all participants will facilitate an exchange on ways of engaging with diverse publics in co-creating histories of technology that can enhance people's ability to create a more liveable world. Looking beyond the conference, the session will generate ideas for future activities of an emergent research network around this topic (publications, summer school, visiting exchanges, etc.).

Organizers: Evelien de Hoop, Timothy Moss, Erik van der Vleuten, Heike Weber

Commentator: Evelien de Hoop

The Circular Economy target –seen through the lens of 50 years of "green" recycling (Heike Weber)

ToE24 – programme overview (page 1-3) and detailed programme (page 4-85)

In current transformation agendas, re-forming the “linear economy” of today into a “circular” one figures as a pillar towards sustainable lifestyles. Society, industry and politics alike seem aligned in their hope to thereby solve the crisis of ecologically harmful wastage. Time and again, recycling has been conceptualized as a “technological fix” for waste and resource crises. From the 1970s ecological turn onwards, it has been intentionally intensified to “green” consumption, production and waste generation. These past experiences represent a reservoir of “usable pasts” for the present. While rising recycling quotas suggest a success story, the usable pasts approach provides us with more nuanced “lessons” from the past. It underlines the interaction of radical changes and long-term developments and the larger systems in which recycling was and is embedded. Over the past 50 years, recycling has served to maintain systems of production, consumption and disposal rather than to change them.

Heike Weber is Professor of the History of Technology at the Technical University of Berlin. Her main research areas lie in the 20th century history of technology, environment and consumption, in addition to design history, gender studies, mobility studies and questions of making technology popular through media. Her current subjects are industrial waste, cultures of repair, and the lifespan of things, including the obsolescence debate.

Historical transformations in Swedish forestry (Janina Priebe)

The 20th century saw two major transformations in the Swedish forest sector, both of which fundamentally changed the forest as a socio-ecological system, one in the 1950s-1960s and the other in the 1990s. The first transformation was characterized by mechanization and rationalization, turning multiple use forestry into a monocultural cropping system. The second, however, was marked by massive deregulation of a highly mechanized industry and a response to growing public criticism of forestry practices and the one-sided focus on production. This presentation focuses on the intersections of technology and frames in these transformations. It is based on ongoing research into what lessons about transformative agents that can be drawn from these historical transformations for the current

transformation of forestry in the context of climate change. Moreover, this presentation aims to initiate a methodological discussion on the use of a transtemporal and comparative perspective on social-ecological transformations within the same sector.

Janina Priebe is a historian of science and ideas, with a focus on environmental history. She is the Arctic Five Chair in Environmental History at Umeå University, and co-director of Future Forests, an interdisciplinary forest research and communication platform between Umeå University, the Swedish University of Agricultural Sciences and the Forest Research Institute of Sweden. Her research interests include the history of natural resource development, sustainability, and Arctic history.

Knowledge transfers of past, present and future agricultural practices on the Soy Scene in Chapecó, Brazil (Sjamme van de Voort)

The paper will reflect on how knowledge transfers occur in the context of soy production in and around Chapecó, Brazil, based on fieldwork within the Soy Stories project, a transdisciplinary, transnational collaboration investigating pasts and futures of soy in The Netherlands and Brazil. Reflections will focus on how knowledge is transferred, stored, maintained, developed, broken, or revived, among actors involved in soy production. Interviews with soy farmers, cooperatives, indigenous people and other actors involved in soy production in and around Chapecó, Brazil, were conducted in November 2023. Here, the issue of knowledge transfer about past, present and future practices played a significant role—from generational knowledge transfer, institutionalisation of industrial practices, and genetically modified seeds. All instances of knowledge transfer—or rupture thereof— represent a look into the infrastructure of historical reproduction of engagement with ecological practices enacting large-scale transformations, reaching from production in Chapecó to consumption in the Netherlands.

Sjamme van de Voort explores in his work at the Free University of Amsterdam how memory theory can enrich sustainability history. Before employing memory studies to engage with knowledge production in sustainability issues, Sjamme worked as a Bernadotte fellow at The Royal

ToE24 – programme overview (page 1-3) and detailed programme (page 4-85)

Gustavus Adolphus Academy for Swedish Folk Culture. He received his PhD from the University of Nottingham's Centre for Research on Cuba.

The shimmering agency of water as imagination infrastructure (Moniek Driesse)

In the face of a global climate crisis intertwined with an imagination deficit, this paper, based on my recent PhD dissertation, advocates for relational shifts to transcend exploitative paradigms. By centring aquatic agency and employing imaginative techniques, collaborative approaches offer spaces for (re)imagining urban pasts, presents, and futures. This epistemological shift, focusing on water, addresses power dynamics and inequalities, framing collaborative creative approaches as worlding practices fostering planetary care and custodianship. Drawing from collaborative creative processes in Mexico City and Gothenburg, the study examines how aquatic agency challenges established heritage discourses and more-than-human connections. The concept of heritage is reconceptualized as a fluid navigational system rather than a fixed entity, emphasizing its world-making capacity. The research, conducted with a diverse group of co-creators, yields outcomes like artistic publications and performance lectures. These collaborative endeavours are seen as tools for tracing intergenerational, cross-landscape relationships, encompassing diverse planetary inhabitants.

Moniek Driesse recently completed her PhD on the heritage of water in Mexico City and Gothenburg that seeks to reconcile large-scale and long-term narrative lines with everyday subjective meaning-making processes. By conceptualizing the term imaginary agency and mobilizing design research methods, she traces agencies of water in urban environments through time and space to re-imagine relationships of care between humans and the planet they inhabit.

Enriching the earth? The Haber-Bosch process, technology, energy, and economic thought in interwar Germany (Henk-Jan Dekker)

Today, the production of synthetic ammonia, a major source of artificial fertilizers, consumes almost 2% of annual energy production, and is responsible for substantial CO₂ emissions. The origins of this process lie in

the late nineteenth century, when concerns about exhausting natural fertilizers led to chemical experiments with alternatives by fixating nitrogen and producing synthetic ammonia. While many chemists contributed to a solution, Fritz Haber's name became connected to the breakthrough invention (1909), and Carl Bosch turned it into a process applicable at an industrial scale at IG Farben. The details of the Haber-Bosch process have been extensively studied from the chemical point of view, and some historians have devoted attention to the implications for energy and economy. However, it is less clear how German engineers and economists at the time thought about the long-term implications of this breakthrough discovery. Based on published and archival sources, this paper aims to shed light on this question by connecting the history of technology and energy to the history of economic thought. The paper studies how engineers and economic experts during the interwar period thought about the (long-term) implications of the Haber-Bosch discovery, by asking how they conceptualized the role of technology, the role of energy, and the relationship between the two, in the process of economic growth at the time and in the future. In the short, the paper hopes to shed light on a crucial scientific, technological, environmental, and economic moment in the development of the modern environment.

Henk-Jan Dekker received his PhD from Eindhoven University of Technology in 2021 with a dissertation entitled "Cycling Pathways: The Politics and Governance of Cycling Infrastructure, 1920-2020". He currently works as a postdoctoral researcher in the ERC project Energy Transitions in the History of Economic Thought (ETRAHET) at CIREN (Centre International de Recherche sur l'Environnement et le Développement) in Paris.

15:00-15:30

Coffee break

Location: GD Aula

15:30-17:00

4.1 Industrialization (individual presentations)

Location: GD Hs3

The upgrade of Athens' electrical network in the Interwar years. The transition to the three-phase electrical current (Yannis Kefalas)

Reconstruction and infrastructure modernisation were a common pattern for most European cities after the end of World War I and Athens was no exception. After the defeat in the Greek-Turkish war in 1922, around 1,250,000 Christian refugees from Turkey came to Greece and most of them were settled in Athens. This population influx, along with the fact that the Athens electrical network was unable to facilitate the city's new electricity needs, led to the granting of the electricity concession to the British Power and Traction Finance Company Ltd (PTFC) in 1925.

PTFC sought to upgrade the electricity network by building a new, technologically advanced power plant near Piraeus, but also by making the transition from the one-phase electrical current to the alternating three-phase one. This was the next step in the electricity supply, empowered by the technological developments in the field of electric systems, with most Western European cities already having completed this transition. However, in the case of Athens this transition did not come without problems. Electrocution accidents, technical omissions from both the company and the governmental infrastructure services, along with the nascent development of electrical engineering in Greece created initially a climate of non-acceptance of the new current supply method in the public sphere.

But were these reasons enough to cause the public's hesitance in accepting the transition to the alternate current? Why did the technical problems and the accidents occur in the first place? How did the Greek state, its engineering institutions, the public and the company itself react in order to resolve the problems? This proposal aims to answer these questions by

moving further from the concept of technology acceptance or technophobia in an industrially backward country, which sometimes stems from an orientalist gaze. More specifically, this proposal will try to showcase that the social and political reactions against the new electric power supply systems had more to do with the financially semi-colonialist ways that the PTFC tried to implement the new current. This argument will be supported by a variety of archival sources from the National Archives in the UK, the Eleftherios Venizelos Archive in Greece and the Press, as well as the relevant bibliography in the fields of history of electrification, technology and infrastructure modernisation.

Yannis Kefalas is a PhD student in Modern and Contemporary History in the Department of History and Archaeology, University of Athens. He has completed his BA and MA studies in the same department. The title of his thesis subject is "The Power and Traction Finance Company Ltd., 1926-1960. Dependency relations, modernization and work in the sectors of energy and urban transport in Greece". His research interests include the Modern and Contemporary Greek and European History, Social and Economic History, Labour and Industrial History, History of Technology and Energy, as well as Gender History.

Christianity within the industrial revolution: the experience of the Social Saints in 19th century Turin (Marco Pozzi)

During the 19th century Turin became an industrial city, reinforcing that role after losing its role as the first political capital of the Kingdom of Italy proclaimed in 1861. Several priests called "Social Saints", among them Giovanni Bosco, Giuseppe Cottolengo, Giuseppe Cafasso, during the 19th century carried out a large number of projects aimed at those excluded by the industrial revolution. My paper analyzes the primary sources of the time such as mainly newspapers and the scientific works of the saints, alongside the more properly religious ones. All this may explain the enormous impact in the popular culture of the city. Turin, in its role as the political capital of Italy, also absorbed influences from Great Exhibitions in European capitals, from which the scientific knowledge of the saints was influenced. From these

historical processes, some elements may also be useful in the information technology revolutions taking place in our time.

Marco Pozzi graduated in Management Engineering, he is currently a PhD candidate for the History of Technology at the Politecnico di Torino (Department of Mechanical and Aerospace Engineering). He deals with the history and philosophy of science and technology, with particular attention to the issue of the transmission of memory and knowledge. Co-editor with Vittorio Marchis of the series in eight volumes “Meetings with the machine” (Mimesis Editore), he collaborates since several years in the courses of “Epistemology of the machine” and “Anthropology of technology” at the Doctoral School of Politecnico di Torino. The results are over two hundred meta-scientific writings that explore the frontiers of the polytechnic culture in the most variable narrative patterns (essay, story, script, storyboard, poem, drawings, etc.).

The robot between “disruption” and “subversion”. Notes for a feminist history of industrial automation (Ginevra Sanvitale)

Industry 4.0 is set to bring profound transformations to the job market, by intensifying the use of AI and robotics automation in manufacturing processes. Women are particularly vulnerable to job loss in this transition (Maggioli and Cunha 2023), and in past automation waves they were often excluded from up-skilling opportunities (Balka and Wagner 2020). Current feminist research on robotics is largely informed by concepts of Cyberfeminism and Feminist Care, which can provide fruitful insights on some dimensions of robotics, e.g. social robotics, but do not fully account for industrial robotics. Indeed, the more robots become humanised, the more workers become dehumanised (Sinclair 2022). This paper contributes to develop a feminist understanding of the implications of past and contemporary industrial robotics automation for women’s labour. I critically compare the concept of “disruption,” as it emerges in Industry 4.0 discourses, with the concept of “subversion,” as employed by 1970s feminist movement Wages for Housework (Dalla Costa and James 1972). I present examples of disruptive and subversive robots in the history of 20th century

Italian poultry processing automation, focusing on their cultural and socioeconomic significance for women’s labour.

Ginevra Sanvitale is a Postdoctoral Research Fellow at Trinity College Dublin, Centre for Digital Humanities. Her current research explores feminist methodologies and perspectives to analyse historical and contemporary implications of food industry automation for women’s labour, within the interdisciplinary Horizon Europe project MOZART. Her PhD project (Eindhoven University of Technology, 2022) investigated the political significance of emotions in the Italian history of computing. Her research interests include the intersections between technology, emotions and politics; marginalised actors in the history of technology; the implications of automation and digitisation for labour; feminist perspectives on technoscientific development.

4.2 Maintenance and Repair Studies: Exploring Change and Persistence in the History of Technology

Location: GD Hs8

"Unfortunately, we are not in a position to provide an overview of the main trends in the history of maintenance and repair. Has maintenance as a proportion of output gone up or down? [...] How has this changed over time?" – Since David Edgerton identified this significant gap in the History of Technology in his "Shock of the Old" in 2006, things have finally begun to take off in recent years after a first phase of hesitation. New research projects spanning different historical periods and global regions, engaging with consumer products as much as with infrastructural systems, have started to shed light on this still-understudied field.

This panel reviews recent contributions and ongoing projects from this emerging research area and illuminates diverse cultures of maintenance and repair across a long 20th Century. It delves into this theme through rich case studies from Germany, Austria, Great Britain, the Ottoman Empire, Luxembourg, and Malawi. The contributions discuss various modes of knowledge production and trace transnational circulation processes of

knowledge and artifacts. The panel examines the power relations embedded in technological systems, exploring which were stabilized through maintenance and repair practices and which were challenged by them. In this spirit, it also reflects on the costs of specific maintenance and repair regimes for humans and ecological systems.

In a consumption-driven global society with limited planetary resources, maintenance, and repair practices are crucial to developing sustainable futures. Knowing their past promises to help inform the complex negotiation processes that we face in the "grand societal challenges" (van der Vleuten) ahead. Can Repair Cafés alter our consumption patterns? Are wooden railway sleepers a promising alternative to emission-intensive concrete sleepers on our way to sustainable mobility systems? What can we learn from people's and societies' everyday repair and maintenance practices about the complex relationship between people, their natural environments, and technology?

Organization: David Drengk, Martin Meiske

Repairing Consumer Objects (Stefan Krebs)

The history of repair of consumer objects in the post-war period is usually told as a story of decline. However, the "Histories of Maintenance and Repair in Luxembourg" project has revealed that official statistics on the development of small repair shops show a general stagnation and reorganisation of the Luxembourg repair sector, from mending shoes and clothes to fixing electrical devices and cars, but no general decline of the field. This is also confirmed by a close investigation of family budgets. Contrary to what the story of the triumph of the throwaway society suggests, repair did not disappear. Luxembourg households spent more money on repair at the end of the 1980s than in the 1950s. The paper will compare the Luxembourg case with other (West-)European countries using data from the European Coal and Steel Community. The paper will compare family budgets and repair expenditure in European countries, and investigate how much money was spent on the repair of which consumer objects.

Stefan Krebs is an Assistant Professor for Contemporary History at the Luxembourg Centre for Contemporary and Digital History (C²DH). He studied history, political science and philosophy at the universities of Aachen and Aix-en-Provence. He received his PhD in the history of technology from RWTH Aachen University. As a postdoc, Stefan Krebs worked on projects at Eindhoven University of Technology, Maastricht University and the University of Luxembourg. His current research interests include the industrial history of Luxembourg, the history of deindustrialisation, and the history of repair and maintenance.

Everyday bicycle repair work along fish trading routes in Southern Malawi (David Drengk)

This paper highlights the historical significance of places of bicycle repair along local fish trading routes in the southern part of colonial Malawi in the first half of the 20th century. After the bicycle had been used predominantly by privileged social groups within the colonial administration before, from the 1930s onwards local fish traders increasingly cycled to transport fish to urban markets in the Southern Province. Along such trading routes, numerous repair places developed. Additionally, new user groups like returning migrant workers and soldiers contributed with their cycling and their financial means to the further spread of the bicycle and consequently also to the increased importance of bicycle repairers and local repair shops. This paper elaborates on the continuous relationship between fish traders, the natural environment of Lake Chilwa/Shire River and bicycles and places both bicycle repair practices and often-neglected historical actors, the repairers themselves, at the centre of this narrative.

David Drengk is a postdoctoral research fellow at the chair of history of technology and economy at Technical University Dresden. He is trained as an Africanist historian as well as a historian of technology. He received his degrees from Humboldt University, Leiden University, the Technical University Darmstadt and did his PhD in (West African) History of technology in the five-year ERC-project "A Global History of Technology, 1850-2000" under the supervision of Prof. Mikael Hard. His research interests lie in the

interrelationship between humans, nature, and technology, focussing on perspectives and actors in the Global South, especially Sub-Saharan Africa. His work is thus located at the intersection of environmental history, African history, and global history of technology. In his current research project, David Drengk is working on a socio-environmental history of cycling and the bicycle in south-eastern Malawi in the long 20th century, which is embedded in the research network Cycling Cities: The African Experience.

“We Were the Ones Who Made Lawrence Famous”: Maintaining the Hejaz Railway in the Last Days of the Empire (Zeynep Ecem Pulas)

This research examines the maintenance and repair of the politically contested Hejaz Railway (1908-1918), the only Ottoman-funded, built and operated infrastructure that connected Damascus to Medina. It highlights the extraordinary efforts of Ottoman engineers and workers who diligently maintained and repaired this vital system. In doing so, it contributes to our understanding of the situatedness and uniqueness of each repair, and underscores how these activities not only have significant epistemic virtues, but also allowed non-Western actors to emerge as agents who shaped their own technical trajectory. A close reading of diverse primary sources—foreign reports, travellers' accounts, T.E. Lawrence's records, and an Ottoman engineer's memoirs—shows that the Ottomans did their best to “keep the engines running” under extremely challenging circumstances; by mixing and matching spare parts for rolling stocks, repurposing telegraph poles and wires, mending blown bridges, inventing countless processes to extend the use of technology, all the while tapping into local knowledge.

Zeynep Ecem Pulas completed a double major in history and political science at Istanbul Bilgi University. During her MA in global history at Freie Universität and Humboldt-Universität zu Berlin, she worked at the research center re:work and on the digital humanities project of the Hannah Arendt Critical Edition. She is currently a doctoral candidate at International Max Planck Research Schools (IMPRS) at MPIWG Berlin and her PhD project analyses the emblematic technologies of the nineteenth century, the

telegraph and railway, in the Ottoman Empire through the lens of maintenance and repair.

Reconstructing Cultures and Costs of Care: From an Envirotechnical to a Material History of Maintenance (Martin Meiske)

The study of technical infrastructures, such as railways, roads or pipelines, has undergone a significant shift in recent years, moving towards uncovering the enviro-technical dimensions of these large-scale systems. Exploring the maintenance and repair histories of infrastructures, as argued in this paper, urges us to take the next step and deepen the enviro-technical perspective by zooming in on the materialities of maintenance. I will illustrate the heuristic and analytical potential of this approach through the case of creosote – a coal tar oil mainly used for the preservation of wooden railway sleepers. This paper traces creosote from the wood impregnation plants into railway tracks in Germany, Austria, and Great Britain in the early 20th century and sheds light on the maintenance practices in this precarious sector. The unintended mobilities and persistence of creosote, however, also raise burning questions about occupational health, contaminated land, and environmental justice from a transnational perspective, uncovering a long-term toxic legacy that stands at the center of much more recent socio-environmental conflicts.

Martin Meiske is a postdoctoral researcher at the Research Institute for the History of Science and Technology of the Deutsches Museum in Munich and a lecturer at the Karlsruhe Institute of Technology. He studied history and German philology in Potsdam, Zurich, and Bern. Meiske visited Buenos Aires as a Marie Curie Fellow in 2014 and was a doctoral fellow at the GHI Washington in 2017. He earned his Ph.D. at the LMU Munich/Rachel Carson Center in 2019. His current research project, *Cultures and Costs of Maintenance: The Rise of Creosote and its Precarious Legacy*, combines research perspectives from the history of technology (such as on maintenance and repair) with environmental and material history. Among his most recent publications is the edited volume *Beyond the Lab and the Field: Infrastructures as Places of Knowledge Production Since the Late*

Nineteenth Century (edited with Eike-Christian Heine), published in 2022 by the University of Pittsburgh Press.

4.3 Transitions and Transformations in Energy History 4: Energy Infrastructures and Transformations in Europe and Beyond

Location: GD 102

It has become common for energy historians to relate their work to contemporary debates and view historical changes in energy production, conversion and consumption through the lens of “transition”. As several historians have pointed out, however, history has not necessarily consisted of radical “transitions”, but often rather “additions” of new energy carriers and conversion technologies, or more gradual “transformations” of the prevailing energy constellations. Organized by the ToE energy history group, this panel series presents diverse case studies to inform discussions about transitions and transformations in energy history.

Each in their own way, the papers provide fresh interpretations or uncover underexplored histories of energy. They question common assumptions and apply innovative approaches to the study of energy technologies as well as socio-technical continuity and change. Rooted in history of technology, they build bridges to political history, business history, environmental history, social ecology, and STS. By highlighting the question of transitions and transformations, this panel series will both inform the conference theme and provide new perspectives on energy history.

Organizers: Uta Hasenöhr, Odinn Melsted, Jan-Henrik Meyer

Chair: Patrick Kupper

Revisiting ‘Eurelios’: Assessing the Legacy of the World's First Concentrated Solar Power (CSP) Commercial Plant (1981) (Pietro Scoppola)

This paper examines the history and importance of Eurelios, the pioneering concentrated solar power (CSP) plant built in Sicily in 1981 by Italy's ENEL, commissioned by a working group of the European Commission. The group

was formed by some of the most influential European energy companies. With the objective of assessing the relevance of CSP technology in the broader historical context of energy transitions, this research addresses the environmental and socio-economic impacts of Eurelios, which was closed in 1985 due to profitability issues. Moreover, it delves into the work of Giovanni Francia (1911-1980), whose extensive research significantly contributed to the development of CSP systems. Through the analyses of archives and historical records, this research provides valuable insights into the factors that led to the closing of Eurelios, while shedding light on CSP's enduring presence within the energy transition agenda of several nations like the USA and China.

Pietro Scoppola earned a B.A. in Political Science from the University of Roma Tre in 2019. Subsequently, he completed a M.A. in European History in 2022 through a double degree master program between Roma Tre and Humboldt Berlin. Currently, he is in his second year of Ph.D. at Roma Tre under the supervision of Prof. Giuliano Garavini. As a Ph.D. student specializing in the history of energy, his research covers European discussions and initiatives on alternative energy development during the oil crisis years (1973-1986), focusing on the establishment of Italy's ente nazionale per l'Energia Nucleare e le Energie Alternative (ENEA), in 1982.

“Artificial Intelligence is Fueling Energy Transition”: Well, Let's Take It to the History of ‘Smart Grids’ (Panagiotis Kazantzis, Aristotle Tympas, Elli Vartziotis)

Present day artificial intelligence is no longer about building a mechanical brain. In the words of Orit Halpern and Robert Mitchell, what we are experiencing is a ‘smartness mandate’, a drive to make the whole of the material world ‘smart’. In this context, there is no end to claims that it is artificial intelligence that will save the planet, paving, somehow, the way to sustainability. Central to this are specific claims about how, in the phrasing of a Bloomberg article, “Artificial Intelligence is Fueling Energy Transition”. But how did we end up reading that the planet will not be saved by a transition away from fossil fuels, but, by a fuel called artificial intelligence?

ToE24 – programme overview (page 1-3) and detailed programme (page 4-85)

For an answer to this, as well as for an answer to what the mandate for smartness has so far given us in regards to energy transition, our presentation introduces to history of ‘smart grids’. Our primary sources are articles published in both engineering and journalistic media in the last quarter of a century.

Panagiotis Kazantzis, a graduate of mechanical engineering from the National Technical University of Athens, works on a PhD in History of Technology and Environmental History at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens. A recipient of a dissertation fellowship by the Hellenic Foundation of Research and Innovation (H.F.R.I.), he studies the history of renewable energy projects in Greece.

Aristotle Tympas, a graduate of chemical engineering from the Aristotelio University, is a professor at the History and Philosophy of Science Department, National and Kapodistrian University of Athens, and director of its STS graduate program. He is the author of *Calculation and Computation in the Pre-electronic Era* (Springer, 2017) and *Analog Labor, Digital Capital* (Angelus Novus, 2018, In Greek).

Elli Vartziotis, holder of an undergraduate degree in engineering from the Karlsruhe Institute of Technology and a graduate one from MIT, is a graduate student in STS at the National and Kapodistrian University of Athens.

Transitioning Beyond Oil: European Energy Law, the Oil Crisis and the Challenge of the Environment in the 1970s (Jan-Henrik Meyer)

The oil crisis of the 1970s is routinely regarded as a major turning point in energy history. In its wake, the concept of energy transition was coined. In the European Communities (EC), this was largely conceived as a transition from oil to nuclear. Since the 1950s, the EC had been committed to nuclear energy, presented as a modern source of energy, suitable to achieve energy security. In the 1970s, the EC reinforced nuclear development – including controversial fast breeders – with funding for research and prototypes. However, facing environmentalism and a growing anti-nuclear movement, by the late 1970s, the EC also started to support research for renewables and

energy savings. This paper seeks to trace how and explain why, in the context of a nascent EC energy policy, and despite the EC’s traditional commitment to nuclear, laws and funding instruments were devised to promote an energy transition beyond nuclear.

Jan-Henrik Meyer is a researcher at the Max Planck Institute for Legal History and Legal Theory in Frankfurt (Main), where he has conducted research on the history of the emergence of European Union environmental law, and just started new project “From Coal to Renewables. The History of European Energy Law”. Meyer has worked on energy issues from an environmental and social history perspective, in two major projects: as a principal investigator on the “History of Nuclear Energy and Society (HoNESt)”, and more recently on a project on the “Citizens’ Dialogue on Nuclear Energy” in the 1970s in West Germany.

4.4 Management of water, projects, climate and injuries (individual presentations)

Location: GD 202

Infrastructuring the Water State in Greece: Regional Imaginaries of Productivism and Water Management in Thessaly, 1950-2023 (Stathis Arapostathis, Yannis Fotopoulos, Dimitris Lagouvardos, Vasso Karantzavelou)

Early in September 2023, there were devastating floods in Thessaly that ravaged the region's social and economic life and shocked the country with their severity, implications and impact on the environment and society. This presentation makes a scholarly contribution to the field of social construction of natural disasters. Thessaly is the principal agricultural hub of Greece and the second largest plain in the country. The design and construction of large-scale dams, irrigation channels, and drainage infrastructures are subjects of our research. Our argument is that the notion of autarky in agricultural products was associated with methods of increasing productivity, such as the implementation of monocultures, chemicalization, and mechanisation of production, as well as the introduction of new plant

varieties. The imaginary of productivism was materially, symbolically and ideologically co-produced with national and regional level conceptions of water and land resource exploitation and control. The primary focus of our study pertains to emblematic cases and infrastructures within the region. The first is the case of lake Karla's drainage in the 1960s. The second is the incomplete diversion of the Acheloos river. The aforementioned cases are approached as technopolitical endeavors that have boosted the imaginaries of competitiveness and productivity while at the same time influencing the establishment of governance structures at the local and regional levels through interventions that have altered the geographical boundaries of the region. This study presents empirical findings derived from interviews conducted with engineers and policy makers, as well as an analysis of previously untapped state and regional archives.

Stathis Arapostathis, is Associate Professor in the History of Science and Technology in the University of Athens, working on history of sociotechnical transitions, politics of knowledge and technological infrastructures, transitions studies critical science and technology policy.

Yannis Fotopoulos, is a Postdoc researcher working at the interface of History of Technology, History of Technological Infrastructures, and the Politics of Sociotechnical Transformations.

Vasso Karantzavelou, is a PhD student in the History and Sociology of Science and Technology. She is working on the agrifood transformations.

Dimitris Lagouvardos, is a PhD student in the History of Technology and Transition Studies. He is working on just energy transitions

Projects as arenas for transformation (Timo Leimbach)

Historical research has frequently researched into the ways specific technological projects have impacted or even transformed society, politics, and the economy. Consequently, various perspectives, including public acceptance of technologies, societal implications of their use, impacts on business models, or political controversies surrounding regulation, have been scrutinized. However, less attention has been devoted to a common thread: the manner in which these projects were executed. Since World War

II, the increasing complexity of technological developments has given rise to a specific set of technologies to manage those projects. Beginning with the Cold War arms race and the race for the moon, diverse methodologies and tools for project management have evolved. Initially conceived as a means of managing innovative projects like the Manhattan Project (Lenfle/Loch 2010), the discipline has struggled over time with various challenges. Firstly, there's the challenge of employing standardized best practices for creating unique outcomes (Crawford/Pollack 2007). Secondly, there's the disparity between generic management technologies and domain specific knowledge in f.e. construction, IT, or other areas. Finally, projects inherently possess a promissory character, leading to expectations and biases that influence their perception before, during, and after implementation (Pollock & Williams 2010; Borup et al. 2006). This situation has resulted in the evolution of different approaches, often closely tied to specific domains like IT (agile), design (Design thinking), or others, which increasingly shape not only business activities (Schoper et al. 2019) but society as a whole (Jensen et al. 2016). This paper will analyze how the sociomateriality of management technologies (Pinch & Jarzabkowski) interacts with the technologies in development and how they adapt to the needs of different actors in the process. The goal is to demonstrate how transformation processes are negotiated using various forms of management technologies and how this, in turn, impacts the transformation processes.

Timo Leimbach is Associate Professor at the department for Digital Design and Information Studies, Aarhus University. He is affiliated to the Center of Science, Technology, and Society studies and to the Center for IT Project Management and Innovation. His current research focusses on the evolution of project management and its intersections with digital transformation of business, economy and society as a whole. He received a master degree in Economic and Modern History as well as Business Administration from the University of Mannheim, Germany (2003) and obtained his PhD from the LMU Munich for his thesis on the development of the German software industry (2009). Between 2007 and 2015 he was a senior researcher and project manager at the Fraunhofer ISI working with public and private clients

on IT innovation and STI policies in this field. Before that he worked and researched at the Research Institute for the History of Technology and Science of the Deutsches Museum, the Institute for Information Sciences and New Media at LMU Munich and the Department for Management, Politics and Philosophy at the Copenhagen Business School.

Artificial intelligence and climate change: what solutions for the Mediterranean hot spot? (Nádia Loureiro)

In recent years, artificial intelligence and its various applications have gained prominence. The energy impact of the wars in Ukraine and Gaza, coupled with the climate crisis, has indirectly driven the development of Artificial Intelligence (AI) technologies, with the aim of maximising energy efficiency and overcoming energy supply shortages. The Mediterranean region is particularly sensitive to climate change, more so than any other part of the world, and is feeling the negative impacts of climate change more acutely. Inflation and wars in the region, especially in Ukraine, which emphasises the great dependence on the energy sector, have further aggravated the humanitarian catastrophe felt by the Mediterranean population and have made it urgent to diversify the economy, which is highly dependent on oil and gas. From Portugal to Jordan, electricity, transport, and the food industry are some of the major areas in which AI is being developed and can be applied with the aim of improving the quality of life of people in the region. However, it is essential that its use is combined with effective public policies, adequate investment in infrastructure and sustainable technologies, as well as collaboration between different stakeholders to maximise its positive impact and investment.

Nádia Loureiro is a PhD student in International Relations, specialising in History and Theory of International Relations at the New University of Lisbon. Her research project/doctoral thesis is on parliamentary diplomacy in Portuguese foreign policy. Since 2018, she has been an advisor to the Portuguese Parliament in international relations and cooperation. Previously, she worked in the private sector, in the export sector, and was a military officer in the Portuguese Air Force.

“It is necessary to transform a craft into a science”: prosthetics for Russian military invalids during the First World War (Olga Okhotnikova)

During the First World War, prosthetics became an essential part of the care of Russian disabled military personnel who had suffered amputations as a result of wounds and disease. The scale of the demand for artificial limbs revealed problems with government provision, from logistical difficulties to material shortages. At the same time, it stimulated discussion among medical professionals, who highlighted the problem of the lack of systematic scientific studies in the field. The prosthesis became a material manifestation of disability, linking technical production with war-influenced medical science – the developing surgery, as well as the emerging fields of orthopaedics and traumatology, whose common task was to restore the disabled and their ability to work. Using archival collections of state institutions, medical periodicals, and special publications on prosthetics, I plan to investigate in which discourses the deprivation of a limb and its replacement by an artificial one was conceptualised, what systems of scientific knowledge were used and created to address this issue, in what context and by whose efforts transformations in prosthetic technologies took place, and how they influenced the individual trajectories of war disabled people.

Olga Okhotnikova is a PhD student of Faculty of History and the Arts, History of Eastern and South Eastern Europe in Ludwig-Maximilians-Universität in Munich.

4.5 ICT (individual presentations)

Location: GD 203

Gender aspects of early Swedish computer programming (Aron Ambrosiani)

In the 1950s, electronic computers transitioned from military use to tools for office rationalization, creating a shortage of computer professionals: operators, programmers and systems developers. Educational institutions responded to the demand from private businesses by offering a wide range

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of computer-related educational programs and courses. Not least for female office workers, programming skills became a path to better working conditions and new career opportunities. Previous research (Ensmenger 2010, Abbate 2012, Hicks 2017) highlights how both women and men worked as programmers during the 1940s and 1950s, but that the situation subsequently changed. Bureaucratic barriers to female workforce participation, the establishment of software engineering and a strict gender division of labor contributed to programming in both the US and the UK becoming a male-dominated profession. But how well do the existing explanatory models work when applied to other countries? In Sweden there are stories about early female programmers, but in the form of anecdotes and occasional journalistic reports. A systematic scientific analysis is lacking. Based on my research, I will present both quantitative and qualitative contributions to the research field. First, I have compiled a novel statistical dataset on who studied and worked with programming in Sweden in the 1950s and 1960s. Second, I contribute to the understanding of how the new education programs affected recruitment to programmer jobs, using job advertisements from digitized newspapers and the business press. Given the societal significance of the IT sector today, it is relevant to study its history. An in-depth historiography that takes local and regional differences into account can increase the understanding of what the programming profession looks like today and why the efforts made to broaden recruitment to technical education and the IT sector in the future will succeed or fail.

Aron Ambrosiani is a doctoral student in history of technology at Chalmers University of Technology since 2023, researching gender aspects of early Swedish computer use and programming.

Transborder Buddies: Fostering Intercultural Dialogue through ICT (Antonija Cavcic)

The Erasmus (+) Programme has enabled the mobility of millions of tertiary-level students and teachers within Europe since the late 1980s. In addition, “youth exchanges” like Erasmus’ lesser-known eTwinning programme has provided an online platform for school children across Europe to exchange

and collaborate on projects since 2005-before the iPhone was even launched. In that sense, eTwinning was arguably a groundbreaking opportunity for European children to acquire not only ICT skills, but also intercultural communication competence in a pre-pandemic context. But to what extent has eTwinning nurtured students’ cultural sensitivity and attitudes towards diversity and inclusion in a context of greater transborder flows and conflict? This presentation discusses the findings from a discourse analysis of eTwinning-related scholarly articles, testimonials, and reports. The general findings reveal that although the opportunity has sometimes faced criticism from teachers or parents who have labelled it a “distraction” or “time consuming”, participants have praised it for fostering intercultural understanding and a desire to cooperate with peers abroad. And in a time of greater transborder flows and tension, maintaining this programme is critical.

Antonija Cavcic is originally from Western Australia and currently a senior lecturer at Toyo University, Japan. Her current research interests include student mobility in a post-pandemic context and gender representation in digital media. Generally, though, she researches in the field of cultural studies and foreign language education.

European trends and transformations as a driver for Internet adoption in Luxembourg: from telematics to the first steps towards the Internet (from the 1970s to 2002) (Carmen Noguera)

This presentation aims to contextualize the evolution of Internet adoption in Luxembourg within the trends and transformations that took place at the European level from the 1970s until 2002. While the transformations in technology and infrastructure were taking place, helping to shape the European integration in what Misa & Schot (2015) have described as “hidden integration,” in parallel, economic, political, and societal transformations were taking place at the European level, which influenced how Luxembourg adapted, adopted and appropriated the Internet and the web. We may distinguish three main periods with different narratives in Luxembourg's path towards the Internet until 2002, linked to the evolution of technology

as well as to European initiatives or recommendations taking place simultaneously. The first period runs from the 1970s to the early 1990s and is a time when technology and telecommunications merged. Luxembourg participated in the data-transmission network, Euronet, launched its public packet-switched network, LuxPac, while the Postal Administration launched its telematics services, such as videotext. The second one, from the early 1990s to 1999, was marked by the "information society" narrative at the political level, linking ICTs with economic growth, promoting a "kind of determinism" (Badouard & Schafer, 2014: 11), and advocating for the liberalization of the telecommunications for a more competitive economy. These ideas materialized in 1995 in Luxembourg with the launch of the Comité Info 2000. Finally, the third one, starting in 1999, saw a transition from the "information society" narrative towards a more user-oriented concept, the "knowledge society" by guaranteeing "an information society for all". This was represented by the eLuxembourg action plan, launched on 26 January 2001, inserted into the umbrella of the eEurope Action Plan adopted at the Feira European Council on 19 and 20 June 2000.

The analysis of these three periods allows to question the intricacies of European and Luxembourgish transformations, the influence of an Europe of technology and experts, as well as to discuss the drivers of the digital transformation.

Carmen Noguera is a Doctoral Researcher at the University of Luxembourg and is working on a doctoral thesis on digital cultures and their development in Luxembourg (the late 1990s to the present day) under the supervision of Prof. Valérie Schafer. Carmen has a degree in journalism from the University of Sevilla, Spain, followed by a DEA (post-graduate diploma in advanced studies) in EU and International Relations from the University Complutense Madrid. With over 15 years of experience in digital marketing and communications in the private sector, Carmen Noguera has focused on developing marketing and communications strategies, corporate e-reputations, digital footprints, social media strategies, and digital mentorship.

Supranational digital transformation of public administration as a factor strengthening the legal and social dimension of EU citizenship (Izabela Wróbel)

The European Code of Good Administrative Behaviour (2001) and the Charter of Fundamental Rights of the EU (2000, 2007), along with the right to good administration recognised therein, initiated the process of Europeanisation of standards for handling matters by public administration bodies in the EU

Member States. The digitalisation of public services, which we are currently witnessing, is also subject to Europeanisation. The European Declaration on Digital Rights and Principles for the Digital Decade (2022) and the Digital Decade Policy Programme 2030 (2022) provide that everyone will have online access to key public services in the EU. Regulation (EU) 2018/1724 establishing a single digital gateway created the legal framework for a European data space where public administrations can share information in a trusted manner. December 2023 marks a 'revolution' for administrative practice - implementing a government-to-government data space, known as the One-Only Technical System, in each Member State and making 21 administrative procedures available to citizens and businesses fully online via the interface 'Your Europe'. The aim of research on this process is to determine the impact of the digital transformation of public administration carried out at and from the EU level on the effectiveness of exercising rights resulting from EU citizenship and the degree of identification with the EU. Preliminary research on the changes led to the hypothesis that they would strengthen the institution of European citizenship, both in its legal dimension (facilitating the exercise of the right to move and reside freely within the territory of the Member States as the most important right of EU citizens) and in its social dimension (accelerating the formation of European identity among the EU citizens).

Izabela Wróbel is professor at the WSB Merito University in Wrocław, doctor and habilitated doctor of legal sciences in the field of law, doctor of humanities in the field of political science, author of over a hundred scientific

publications. She specialises in European Union law, in particular fundamental rights, asylum and immigration law, internal market law and new technologies law. She also deals with the Europeanisation of the law of EU Member States, in particular the law relating to third-country nationals. She conducted research, among others, at the European University Institute in Florence and the Max Planck Institute of Comparative Public Law and International Law in Heidelberg. She worked, among others, at the University of Wrocław and the University of Zielona Góra. In 2009-2010, she was a member of the team of experts on individual rights in the EU area of freedom, security and justice at the Office of the Polish Ombudsman in Warsaw. Currently, she heads the Legal Research Centre at the WSB Merito University in Wrocław. She also works as an attorney-at-law in her own law firm in Wrocław.

4.6 Enlightening transformations through histories of technology (interactive group-based session)

Location: GD 204

As transformation agendas become fixated on the future and the opportunities and perils it poses, there is an urgent need to draw on the experiential resource of the past to help navigate the global challenges we are encountering. Whilst lip-service is frequently paid to “learning from the past”, history is rarely mobilized with intent to provide guidance, context or correction. There is little systematic research on how historical knowledge really matters to practitioners, whether policy makers, business leaders, civil society groups or individual citizens. The effectiveness of efforts to inform current debates through historical reflection is poorly understood.

The purpose of this double session is to explore the current and potential contribution of the history of technology to render historical knowledge relevant to socio-ecological transformations. The first session will present, with inputs from four contributors, state-of-the-art research on the topic. Issues addressed include drawing lessons from past transformations, challenging assumptions about the transformative capacity of innovations,

imagining infrastructures in past and present, and exploring knowledge transfer over time. The second session will focus on methods of mobilizing, co-producing and communicating histories of transformative value. Two introductory inputs will unpack what usable infrastructure pasts can mean and how histories of technology can be used and abused. Subsequently, interactive formats involving all participants will facilitate an exchange on ways of engaging with diverse publics in co-creating histories of technology that can enhance people’s ability to create a more liveable world. Looking beyond the conference, the session will generate ideas for future activities of an emergent research network around this topic (publications, summer school, visiting exchanges, etc.).

Organizers: Evelien de Hoop, Timothy Moss, Erik van der Vleuten, Heike Weber

Past-proofing infrastructure futures: usable histories of urban technology (Timothy Moss)

In increasingly urgent debates about climate, environmental and societal crises, talk of the future is drowning out consideration of the past. In the maelstrom of futures talking, the value of history as a compass for societal orientation is often unrecognised or even misrepresented. In my contribution I present initial findings from a new research project that demonstrates –through the lens of infrastructure –how history can be used as an experiential resource to help navigate the multiple crises we are facing today. The purpose of this project is to generate knowledge on how the past can be mobilized, critically and productively, to help shape transformative pathways for urban infrastructure systems of energy and water, using Berlin as an empirical case study and site for knowledge dissemination. I will explain my conceptual understanding of usable infrastructure pasts and the methods I am applying to identify and communicate them.

Timothy Moss is Senior Researcher at the Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys) at the Humboldt University of Berlin and Honorary Professor at the Leibniz University Hannover. Tim’s research is distinctive for

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connecting historical studies of infrastructure with contemporary debates on sociotechnical and urban transitions. He is currently engaged in a DFG project on usable infrastructure pasts.

“Usable pasts” from the perspective of practitioners (Karena Kalmbach, Clara Frysztacka)

The question of how “usable” the past is when it comes to working towards more just and sustainable futures goes far beyond the field of history of technology. There are multiple ways in which history is mobilized for political purposes - both to support and to oppose socio-environmental transformations. We think that history of technology scholars need to be aware of these wider, highly politicized dynamics when they want to inform current debates through historical reflection. In this input two practitioners from the fields of science communication and civic education will provide examples of how drawing on historical research matters in their daily work, show how these historical perspectives interrelate with possible pathways into the future, and shed light on the opportunities and pitfalls that accompany the endeavour to “learn from the past”.

Clara Frysztacka has a PhD in history and heads the unit on contemporary history at the Böll Foundation, Berlin. This unit is dedicated to using history to enrich current political debates, focusing on the history of democracy in Germany and Europe. Prior to this appointment she worked as a research associate in contemporary European history at the Europa-Universität Viadrina in Frankfurt/Oder.

Karena Kalmbach heads the unit Strategy and Content at Futurium Berlin, an exhibition location dedicated to shaping futures. She obtained her PhD from the European University Institute in Florence and subsequently held a position in History at Eindhoven University of Technology. Her areas of expertise include Social and Cultural History of Technology and the Environment (with a particular focus on Nuclear History), Politics of Memory, and Social Studies of Science and Technology.

Saturday, 21 September 2024

Location: Gräfin-Dönhoff (GD), Logensaal (LH)

09:00-10:30

5.1 Sociotechnical Challenges of European Migration and Border Control or why Pylos ‘Data Matters’

Location: GD Hs3

On 14 June 2023, an aging boat, named *Adriana*, sunk in the deepest part of the Mediterranean Sea, in the international waters outside the Greek port of Pylos. Europe, as represented by the Hellenic Coast Guard, was present as, at best, an observer of how it capsized and sank. We have some data: of the hundreds of migrants onboard, one hundred and four were rescued, while the dead bodies of eighty-two were recovered. Greek and other EU officials have soon acknowledged that the dead migrants at the bottom of the sea outside Pylos are many more than in any other similar case. So many that, Pylos, a symbol of how to welcome needy strangers ever since the writing of the opening rhapsodies of the *Odyssey* (a pillar of European and world civilization), is by now an exemplar of how needy strangers may find the most tragic death. In the age of technology for producing all kinds of ‘big data’, the ‘no data’ regarding those lying dead in the deep sea outside Pylos represents a defining sociotechnical challenge of European migration and border policy—not to say of European civilization as a whole.

This is why it is proposed that at the next ToE conference, hosted by the European University Viadrina, in Frankfurt/Oder, there is going to be an unconventional session on what a network specializing in research on history, technology and Europe can do to usher in producing data about Pylos, data to help the European society understand how to avoid another tragedy like that of Pylos.

The idea is to send out an invitation to scholars from the new EU COST ACTION research network called ‘Data Matters: Sociotechnical Challenges of

European Migration and Border Control (DATAMIG)' to collaborate in organizing this session.

The idea is to, further, integrate into this session an art event, with international actors to be invited to read extracts from the *Odyssey*, on the importance of having a civilization that is defined as such by way it treats needy strangers who come from the sea – the importance of treating them the way the wise king Nestor embraced Telemachus, the desperate son of Odysseus. We could start by an invitation to Kate Winslet and Leonardo DiCaprio, who could join online. And, also, to invite a singer who specializes in traditional songs from all around the Mediterranean. We could start by an invitation to singer Savina Yiannatou, who could join in person.

Organization: Dagmara Jajeśniak-Quast, Olga Lafazani, Jan-Hendrik Passoth, Aristotle Tympas

5.2 Concern for sustainable development in the behaviour of entrepreneurs in Poland

Location: GD Hs8

The prepared panel consists of three speeches that are united by a common thread of implementation of sustainable development. Its aim is to show that economic actions taken by local communities to protect the natural environment can only bring benefits. The panel also allows us to learn about the way of modernizing the awareness of Polish society, which, more than thirty years after the beginning of the process of the country's exit from the socialist economy, has become a society sensitive to eco-trends and feels direct responsibility for the fate of our planet.

The first speech pointed to the implementation of the principles of sustainable development by family businesses operating in Poland. In this country most family businesses are micro-enterprises or small and medium-sized enterprises. Their activities lead to a reduction in carbon footprint by shortening supply chains at the local level and building relationships with customers. These companies are interested in the quality of the local environment because they derive real benefits from this basic resource and

at the same time serve the local community by providing services and specific goods. The second speech concerns the status and prospects for the establishment of energy cooperatives in Poland. Based on German experience, the principles of corporate social responsibility are being implemented in Poland. Energy production for own needs is becoming a fact. Energy cooperatives help in this task. The legal conditions for the development of this initiative in Poland will be presented. The third speech concerns the problem of the so-called short supply chains as an excellent idea to increase the professional activity of small family farms. Agriculture was recognized as one of the key areas requiring significant changes after Poland's accession to the European Union in 2004. Despite the reduction in the level of employment in this sector of the economy in Poland to approximately 10%, it is still a high percentage. The idea of shortening food supply chains to the local market from a local producer is consistent with the principles of responsible development. It allows us to preserve the biodiversity necessary for the survival of our planet.

Moderation: Ewelina Idziak

Family businesses as an opportunity for the local economy to enter the path of sustainable development. The example of Poland after 1988 (Sławomir Kamosiński)

Family businesses in Poland's modern history gained a chance to be established after 1988. For this reason, their history is shorter than that of identical organizations operating in Western Europe. Entrepreneurs who started their own businesses at the threshold of transformation are now passing them on to their successors through succession. Most family businesses operate in the so-called local Poland. These are small businesses that typically meet the needs of the local community. The aim of the article is to demonstrate that these enterprises, closely related to the local environment, implement, often unconsciously, the principles of sustainable development. These companies make it possible to shorten supply chains on the local market, build direct relationships with customers, create local brands and become a safe place of work for employees living near this

organization. The European Union's policy shows enormous support for the succession and activities of these organizations.

Sławomir Kamosiński is a professor at the Faculty of Law and Economics of Kazimierz Wielki University in Bydgoszcz. His research interests include the functioning of industry in the centrally planned economy of communist Poland, changes of business ownership in Poland after 1988, modernisation of the structure of industry, entrepreneurship in Poland after 1988, the contribution of entrepreneurs to the modernisation of the Polish economy, and the history of family businesses, brands and trademarks. In 2023, he published a monograph *Przedsiębiorcy w Polsce w latach 1989 – 2019* (Entrepreneur in Poland in 1989-2019).

Energy cooperatives in Poland. Status and prospect (Maryla Bieniek-Majka)

The aim of the article is to identify the conditions of operation of energy cooperatives in Poland and the possibilities of their development under the legislative changes of 2023. Based on the literature on the subject, statistical data, KOWR registers and in-depth expert interviews, comparative analyzes were made to indicate the current status and development prospects of energy cooperatives in Poland.

Maryla Bieniek-Majka completed her master's degree in economics at the Koszalin University of Technology. She obtained her PhD in economics at the Faculty of Economics of the Poznań University of Economics and Business. She is the author and co-author of numerous scientific publications. Her research interests concern from economics and organization of enterprises, integration processes, organization of the fruit and vegetable market, common agricultural policy and the idea of sustainable development. She belongs to the Polish Association of Agricultural and Agribusiness Economists. She has been on several news programs on TVP Bydgoszcz as an expert. She participated in many national and international conferences. She completed several internships in Brussels at the European Parliament. As part of international cooperation, she participated in many trainings and internships, for example at ISG Business & Economics School in Lisbon (Portugal), Marijampolė College in Marijampolė (Lithuania), at the Turkish

Çağ Üniversitesi in Mersin and Kocaeli Üniversitesi in Izmit, and in the 1 Decembrie 1918 University in Alba Iulia (Romania). For many years, she combined scientific work with being a manager in an agri-food industry company.

Short supply chains as an idea to increase the professional activity of family farms (Jan Polcyn, Sebastian Stępień)

Agriculture was perceived as one of the key areas requiring significant changes after Poland's accession to the European Union. This opinion resulted mainly from the overemployment in the Polish agricultural sector (approximately 30% of the total labour force) and outdated production technology in agribusiness compared to Western European countries with more advanced agriculture. Since Poland's accession to the Community, the food sector has reduced its employment level to approximately 10%, but this is still approximately a three-fold surplus as opposed to so-called 'old EU'. The persistently high level of work force stems from the significant fragmentation of arable land, managed by small family farms. Due to their low scale of production, such actors are marginalised in the food supply chain and value-added creation, which is reflected in their income deprivation. One way to overcome this problem is to increase farmers' involvement in sales through short marketing channels. Hence, taking into account the above premises, the aim of the research is to determine the propensity of small-scale farm owners to develop sales via short chains. The authors hypothesise that, despite the obvious benefits of reducing the number of intermediaries, agricultural producers are not interested in such solutions. The study is based on a survey conducted on over 300 farms in Poland classified as small family farms. Preliminary results indicate that there are obstacles related to involvement in short supply chains resulting from:

1. Lack of willingness to take up additional activity, mainly motivated by lack of faith in success and lack of ideas that guarantee success.
2. The high average age of farm owners which very often does not motivate to undertake any additional activities.

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3. Skeptical approach to formal requirements related to launching a new production activity, motivated mainly by concern about meeting formal and administrative requirements in the scope of the business.

4. Lack of additional financial resources that could be allocated to short supply chains and fear of failure in implementing new ideas.

Jan Polcyn, PhD, D. Sc. in Economics. He obtained the title of habilitated Doctor of Economics in 2018, has published over 100 scientific articles, including 25 articles in international peer-reviewed journals indexed by Scopus and/or Web of Science. He conducted classes on marketing in education and the economics of education with students at foreign universities - mainly in Romania, Turkey, Serbia and Spain - over 30 times as part of short-term (one-week) stays. The main areas of his scientific interests include social policy, in particular the economics of education, as well as agricultural economics and sustainable development.

Sebastian Stępień, PhD, Assistant Professor at Poznań University of Economics and Business (Department of Macroeconomics and Agricultural Economics). Doctoral degree in economics obtained in 2007, postdoctoral degree (habilitation) in the discipline of economics and finance in 2015. The area of scientific interest includes sustainable development, agricultural economics and agricultural policy, functioning of agricultural markets, environmental economics. Author or co-author of over 120 publications, author or editor of three monographs, as well as several expert reports for scientific and public institutions. He participated in dozens of long- and short-term research internships, including in Italy, Spain, Belgium, the Czech Republic, Slovakia, Romania and Turkey. Principal or contractor of several research projects, including international ones (partners were Romania, Czech Republic, Serbia, Lithuania, Moldova).

5.3 Regulating Transport – considering the environment: Technologies and policies of sustainability in European Transport Systems since the 1980s

Location: GD 102

The transport sector is Europe's 'problem child' regarding environmental policies and a sustainable economy: it is the only economic sector that failed to reduce CO2 emissions in the last thirty years. Road transportation and air traffic are the most urgent problems. Emissions emerging from a growing number of cars, trucks and aircrafts have increased by 30% whereas all other sectors of the economy decreased by 30%. This is remarkable, considering that the European Union and national governments constantly declared their intention to reverse this trend. The European Union plays a key role because it had liberalized transport markets in the 1990s, resulting in a deep structural change of transport flows, value chains and mobility patterns. At the same time, the political promotion of technologies such as Europe-wide traffic information systems to optimize traffic flows or the promotion of e-mobility was intended to limit the negative effects on the environment. That competitive transport markets had their downsides has become increasingly clear since the 2000s. The question of how to react in terms of transport policy became increasingly urgent. Even the most dogmatic advocates of liberal approaches realized that the competitive approach had to be flanked by regulatory intervention. In view of the undeniable negative effects, the question now is how new goals such as reducing emissions or minimizing traffic congestion can be achieved through regulation or new technologies. The panel zooms in on transport regulation in Europe since the 1980s. It asks: How have efforts to reduce CO2 emissions shaped the transport technologies and transport policies? Which regulations have sought to reverse the trend of increasing CO2 emissions from transport? Why have these efforts been unsuccessful? The panel draws on two DFG-funded projects on the foundations of the mobile society (traffic control systems) and on EC infrastructure policy since the 1980s.

Organization: Veit Damm, Christian Franke

Fighting Immobilities: The role of navigation technologies in European concepts for sustainable transport flows since the 1980s (Veit Damm)

Under the slogan of developing an "Intelligent Transport System", the European Commission began in the early 1990s to bundle measures for a

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Europe-wide, environmentally friendly and safe transport system through directives and the promo/on of research projects. It was assumed that an efficient transport system was of central importance for the European economy and that the European Union had to cope with the increasing demand for conges/on-free road because of the impact on the environment. A key role was assigned to ensuring Europe-wide access to reliable traffic information. The presentation highlights the technological change in traffic information systems, in particular the development of the European "Traffic Message Channel" standard and its link to GPS navigation technologies for efficient traffic management and its contribution to more sustainable transport. It further asks about the political instruments with which the European Commission has attempted to standardize these technologies and promote their national implementation.

Veit Damm studied economic and contemporary history at the Universities of Dresden and Cardiff. In 2000 he received a degree in the history of engineers and entrepreneurs under National Socialism at the Hannah Arendt Institute for Totalitarianism Research. In 2006 he finished his doctorate with a thesis on the technical and cultural history of banking and insurance in the 19th and 20th centuries. From 2001 to 2006 he was a research assistant at the Collaborative Research Centre 537 "Institutionality and Historicity" at the TU Dresden. From 2006 to 2008 he was a deputy professor in the Department of Media at the HTWK Leipzig. From 2008 to 2019 he was a research assistant at the Chair of Economic, Social and Technical History at Saarland University. Since 2000 he is a research assistant at the University of Siegen.

Competition and Sustainability: the EC Commission and its handling of two difficult-to-reconcile objectives (Christian Franke)

The EC realised its concept of competitive transport markets, especially in road haulage, between 1989 and 1993 by almost completely abolishing barriers to market entry and price fixing. Competition became the political guidelines for future EU transport policy in 1992. Since then, road freight transport has increased dramatically and so did also emissions. A

reorientation in transport policy was first announced by the Commission in a 2006 memorandum: 'For a mobile Europe - Sustainable mobility for our continent'. Transport was no longer to be assessed from a purely cost-efficient perspective, but also from an environmentally efficient one. Since then, the EU has to master a difficult balancing act, which can be clearly seen in the 2011 White Paper: '... - Towards a competitive and resource efficient transport system'. The presentation will examine how the Commission tried to balance competitive and sustainability-oriented goals in transport policy in the last three decades.

Christian Franke is a researcher and lecturer (at the level of an associate professor) for economic history at the University of Siegen. His research field are the economic, political and technical history of Europe in the 19th and 20th centuries. Special focus areas are the networking of Europe internally and externally through transport and communication systems, questions of the order and regulation of the economy, and the study of the transformation of statehood and society.

A catenary system for heavy duty trucks: German research perspectives on rationality and barriers in a European Context (Mats Werchohlad)

Overhead line systems are of great importance for electric rail transport and have a long tradition in various areas of mobility. Since the 2000s, intensive research has been conducted in Germany on the technical feasibility and rationality of electric road systems (ERS) for heavy duty trucks on long-distance roads. Here, the focus lies particularly on heavy duty trucks, as a comparatively small number of vehicles in this sector is responsible for a large proportion of the mileage and the resulting emissions. Within the German context, the results of numerous research projects have shown that equipping highways with an electric catenary system makes sense both in terms of climate targets and from a market economics perspective. These studies have been substantiated and deepened by practical field trials on three test routes in Germany. However, the national political hurdles to the development of a nationwide overhead line system are compounded by the additional peculiarities and uncertainties associated with European

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integration. The possibility and political will for national and European ERS strategies currently seem to be increasingly receding into the background. In contrast, the European Parliament's regulation on the development of alternative fuels infrastructure (AFIR) and the assessments of vehicle manufacturers are focusing on the scenario of a nationwide expansion of stationary charging points for battery-powered trucks. In this context, the presentation will first explain and summarize the technological genesis and recent history of the various research activities and project plans for overhead line systems in Germany. This will be followed by a presentation and discussion of the extent to which system-immanent properties and usage scenarios of this technology reach their limits in the course of their development and concrete implementation, both in the national context and at European level. With regard to the European dimension in particular, current research approaches and collaborations can be used to discuss and debate both the hurdles and design options within the transport policy framework.

Mats Werchohlad studied mechanical engineering at the Technical University of Berlin and then urban studies at the Bauhaus-Universität Weimar. He explores transformational potentials at the interface of technology, space and education, both from a historical, spatial planning and technical perspective. Since December 2021, he is a research associate in the project "ESOB-RKI - Electric road freight transport with overhead lines and batteries: Rationality, Combinations, Institutional Design" at the Institute of Transport and Space at Erfurt University of Applied Sciences.

Failures of economic integration. Exploring ill-fated projects of cross-border business and technical systems in Northern Europe

5.4 Failures of economic integration. Exploring ill-fated projects of cross-border business and technical systems in Northern Europe

Location: GD 202

In the history of Nordic regional cooperation there is a number of well-known examples of productive failures, where failed attempts at closer political unity have generated new, compensatory forms of regional cooperation. In this panel we explore less known, partly forgotten, instances of ambitious yet failed projects of integration in the Nordic region. The historical focus on failed projects is welcome, as recent years have seen abundant new scholarship in organisation studies on the management of projects and megaprojects. Specifically, we propose that a study of Nordic infrastructural projects – connecting large technical systems and business initiatives across Scandinavian borders – provides a point of entry for a fresh approach to the history of Nordic and, by extension, European “hidden integration”. Such a perspective on Nordic region-making seems warranted, as the focus of Nordic historians has long remained oriented towards the workings and discourses of the welfare state, and recent studies of Nordic cooperation have focused primarily on the work of the national governments or contacts made by civil society organisations. The role of infrastructure and business projects in shaping Nordic integration remains under-researched despite the fact that the region in economic terms is more integrated than ever before. By contrast, therefore, the contributions to this panel shifts the empirical focus towards projects of regional infrastructural integration, exploring how visions of joint Nordic systems of e.g. energy, transports and business have materialized or not, from the postwar years to the era of globalisation. In so doing, the aim of the panel is to reappraise the role of infrastructural processes in shaping regional relations – either as initiators of “negative path dependencies” or as seminal first-movers for the courses and directions of later integration in Norden.

Commentator: Pål Nygaard

Linx AB. The forgotten history of the Scandinavian Eurostar (Andreas Mørkved Hellenes)

Visions of a “Nordic triangle” linking Stockholm, Oslo and Copenhagen with high-speed rail became a major theme in Scandinavian transport debates in the 1980-90s. This was one of a series of visions of an integrated, eco-

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modern Europe of border-crossing labour market regions, connected with efficient alternative transports to polluting cars and airlines. This paper considers the failure to create a sustainable integration of Scandinavia in the late 20th century by examining the rise and fall of the vision of the Nordic triangle jointly with the history of Linx AB, a Swedish-Norwegian state-owned train company created in 2000 and tasked with connecting Oslo, Stockholm, and Copenhagen. The case of Linx, intended to be ‘a Scandinavian Eurostar’, allows me to analyse how, in the wake of Scandinavian Europeanisation, new border-crossing transport visions were tentatively implemented before ultimately failing in 2005.

Andreas Mørkved Hellenes is a postdoc from Chalmers University of Technology.

‘Powerhouse Denmark’ and the non-integrations of the Nordic electricity grids (Håvard Brede Aven)

The paper explores the history of failed attempts at deeper integration of the Nordic electricity systems. For over a century these grids have become increasingly integrated, with some transnational Nordic links even predating the establishment of coherent national grids. Although this large technical system of power exchange has been constantly expanding, however, the history of power exports is rife with failures. Initiatives that have been presented or interpreted as export-motivated have been particularly controversial and thus prone to setbacks. Starting with a 1950s plan to establish a Danish-funded hydropower station on the Swedo-Norwegian border, the paper compares (temporarily) failed attempts at large-scale power exports. Drawing on recent analyses of local protests as a form of system-building and of large technological systems as (potentially) public technologies, the paper explores how certain instances of hidden integration became unhidden and how these controversies shaped subsequent planning and expansions of the electricity systems.

Håvard Brede Aven is associate professor at Western Norway university of Applied Sciences.

Insufficient neighbours? The *Royal League* and the limits of Scandinavian sports cooperation (Martin Johansson)

The paper analyses the creation, aims and public reception of the *Royal League* football tournament, which lasted for a few seasons in the early 2000s. The tournament included the four highest ranked teams in the Swedish, Norwegian and Danish men's football leagues, and was intended to constitute Scandinavian incarnation of the *Champions League* concept. The tournament was supposed to offer professional football to the whole of Scandinavia even during the winter season, and that the tournament was marketed to media audiences as a battle between Scandinavian rivals. However, after only three seasons, the tournament was abandoned after the organisers failed to sell the TV rights. The paper examines *Royal League* in its capacity as a failed Scandinavian cooperation project, with the aim of understanding the possibilities and limitations of Scandinavian cooperation as a business practice in the early 2000s.

Martin Johansson is a researcher at Södertörn University

Coping with loss and anger: Ordinary people and the Kemijoki River Hydropower Project, 1954-2023 (Tiia Sahrakorpi)

Following the end of the Second World War, the Finnish government began to build new hydropower in Northern Finland as a means of making up for energy infrastructure lost to the Soviet Union. Urho Kekkonen, Finland's longest ruling president, was a major stakeholder in the Kemijoki Company, the main energy company in charge of building hydropower plants along the river route and proponent of industrializing Northern Finland from the 1950s to the late 1960s. Along the Kemi River, fourteen hydropower plants were built, with one more hydropower plant (Sierilä village) still in the planning process – a locally heavily protested hydropower project. During the initial building process, the power company requisitioned and forced land sales of river-side farmsteads and private lands for the building of hydropower plants. In numerous cases, the local populations underestimated the value of their land and sold their properties for low value, or as local oral stories attest, were coerced into selling their lands after drinking copious amounts

of alcohol. In addition to Finnish settlements and farming communities being affected by land requisitions and land use change brought on by remodeling the riverscape for hydropower, the Sami were negatively impacted by the building of two of Europe's largest reservoirs (Loka and Porttipahta) on their religious lands. The 1970s marked the first time local populations contested hydropower infrastructure by storming a Finnish government building.

This paper analyses the changing emotional responses to the Finnish government and the power companies through court cases from the Water Court (*Vesioikeus*), letters from private individuals written to the Kemijoki power company and the Ministry of Water contesting land purchases, written life narratives, and oral histories. This paper questions how the scale of emotional coping changed over time and to what extent local individuals and communities protested against the use of state power to build energy infrastructure. To date, much of the historiography surrounding energy history has focused on company and governmental perspectives, while this work adds a microhistorical perspective to broaden our understandings of the history of energy infrastructure. Analyzing court documents and company letters raises interesting questions about the tensions between individual rights and state rights within the context of infrastructure, environment, and modern state-building.

Tiia Sahrakorpi is a Research Council of Finland postdoctoral fellow at Aalto University, Finland. She is working on a history of Finnish energy that is focused on collective memory of energy transitions and how societies remember power plant building. She completed her PhD at University College London, which analyzed Hitler Youth memoirs and how these memoirs represent the Nazi past. In addition to working on historical research, she works also in energy research on projects concerning energy access for all (SDG 7), sustainability, and women's productive use of energy in the Global South.

5.5 Bog-Standard History: Peat-use in Europe, 19th to 21st Century

Location: GD 203

As a “semi-fossil” fuel—practically non-renewable but of much more recent origin than coal or oil—peat is caught between the stools of concepts like the organic energy regime and fossil-fuel age. Similarly, its extraction has often taken up an unclear position between agriculture and mining. Consequently, the use of peat as a fuel is often forgotten in historiography or relegated to local history. In contrast, this panel aims to draw attention to the use of peat, its preconditions and consequences, and surrounding narratives in various European countries. The papers analyse how the use of this resource shaped and was shaped by major technological, environmental, economic, societal, and political transformations. It deliberately assembles case studies covering the 19th, 20th and 21st centuries from Ireland, Finland, and Germany. As the papers will show, the use of peat as a fuel was (and to some degree still is) shaped by and contributed to important transformations like industrialisation, the rise of the nation-state, and, recently, the transition to a carbon-neutral energy regime. Accompanying narratives have changed over time, and peat has been at different places and, over the centuries, been perceived as a sign of modernity or backwardness, as a means to regional or national self-sufficiency, a livelihood for the rural population, or, most recently, as a carbon sink worth protecting. At the same time, peat extraction was an influential factor in the transformation of the landscape so that bogs, mires, or moors that were once widespread in all regions of Europe with high levels of rainfall have been reduced to small relics.

Energy transition as cultural trauma: The “just transition” of Finland's peat industry (Hanna Lempinen)

Globally, Finland is among the few countries where peat is still used for energy purposes. However, growing concerns about the rapidly warming climate have forced the country to reassess its relationship with the CO₂intensive peat. Peat—once synonymous with independence, prosperity and modernity—has become reframed as a harmful source of energy that needs to be phased out to give way to more benign sources of energy and employment.

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In 2019, the Finnish government announced its plan to phase out energy peat use. In this process, a socially and regionally just transition was promised to the around 2500 people deriving their livelihood from peat extraction. Relying on survey and fieldwork and interviews, this presentation sheds light on the ways in which the transition plans failed to account for the diverse meanings and functions that both livelihoods and peatlands can have for those engaged with them, leading to transition outcomes that are more traumatic than just.

Hanna Lempinen is a senior scientist based at Natural Resources Institute Finland (LUKE). With a background in International Relations (M.Soc.Sci., 2010) and Science Communication (MA; 2011), she defended her doctoral dissertation on social sustainability of Arctic energy at the University of Lapland, Finland, in 2017. Since then, she has held teaching and research positions at the universities of Helsinki (2017-2018; 2020-2021) and Lapland (2019-2020; 2021-2023) and worked extensively on the just transition of the Finnish energy sector. Her research interests include social and cultural sustainability of non-renewable resource use and development and sociocultural aspects of energy transitions.

Ireland's Contested Peatlands –More than Material Values (Lily Toomey)

Contemporary climate discourses in Ireland place peatlands at the centre of carbon capture strategies and biodiversity protection. This perspective is a departure from the ways in which peatlands have been variously valued throughout the twentieth century, initially as wastelands, then as sites of industrial extraction with the potential to provide employment and energy security. Peatlands and peat fuel also existed at the centre of social perceptions and cultural representations of rural Irish life, sometimes as symbols of tradition, other times as a vehicle for modernisation. This complex history of fluctuating and shifting understandings about peatlands can shed light on 21st-century contestation between stakeholders over the appropriate treatment of peatlands today. This paper will trace these changes through analysis of a wide and diverse range of sources including

government and institutional records, folklore and oral histories, poetry and literature, scientific reports, films, and photographs.

Lily Toomey is a PhD Candidate in Environmental History, Doctor in philosophy in School of History and Humanities, Trinity College Dublin.

Powered by Peat: The Use of Peat as a Fuel on German Railways in the 19th Century (Ole Sparenberg)

This paper takes the use of peat to fuel steam locomotives as a case study to analyse the largely overlooked use of peat during German industrialisation. Railways are rightly regarded as a central element of the Industrial Revolution and primarily associated with coal. However, in parts of Northern and Southern Germany (abroad as well), coal was unavailable locally, but peat was abundant. In addition, moor cultivation and internal colonisation benefited from peat extraction. Consequently, several railway lines started operations using peat as fuel for locomotives. However, when coal became available all over Germany at competitive prices, railways phased out peat from the 1870s onwards due to its lower energy density. Nevertheless, in the case of railways—like in other trades, industries, and urban markets—peat temporally and locally covered an energy demand that wood could no longer meet and coal could not yet meet. Therefore, peat significantly contributed to German industrialisation by acting as a bridge fuel between the organic and the fossil fuel era.

Ole Sparenberg is a senior researcher based at Karlsruhe, Germany, where he researches and teaches environmental and economic history as well as history of technology. After having defended his Ph.D. 2010 at Göttingen University, he received his “Habilitation” (post-doctoral lecture qualification) at Karlsruhe Institute for Technology in 2022. As a long-standing member of the Tensions-of-Europe “Research Group on Technology, Environment and Resources,” his research interests include natural resources, energy, and the marine environment. Recently, he completed his second book, which deals with the history of deep-sea mining.

5.6 Language and Media (individual presentations)

Location: GD 204

Reading the Want Ads: Demand for English Language Knowledge Among Graduates of École Nationale Supérieure des Arts et Métiers, 1948-1988
(Ross Bassett)

One of the salient features of the late 20th century has been what Rosemary Salomone has called *The Rise of English*¹, in many areas of science, technology, and business. This paper seeks to provide a more fine-grained analysis of that process by examining 5079 ads for employment that appeared in the alumni journal of the École Nationale Supérieure des Arts et Métiers in the years 1948, 1956, 1965, 1974, and 1988. It argues that one key factor in the rise of English as a job requirement (from 4% in 1948 to over 50% in 1988), was the development of a European market. The increase in demand for English corresponded with a increase in demand for other foreign languages as well, with German going from being requested in less than 2% of ads in 1948 to 12% of ads in 1988.

Ross Bassett is professor of history at the North Carolina State University and received my PhD in history of science from Princeton University in 1998. He is the author of two books, *To the Digital Age: Industrial Research Labs Start-Ups and the Rise of MOS Technology* (Baltimore: Johns Hopkins University Press, 2002) and *The Technological Indian* (Cambridge: Harvard University Press, 2016). He is currently working on a history of how French engineers learned and used the English language in the 20th century.

«Marketing the Transformation. Introducing the technological innovation of Color Television in Germany, France, and Luxembourg» (Matthias Höfer)
1967 was a year that saw the public launch of a fundamental technological innovation in Germany and France: starting from the 25th of August and the 1st of October respectively, emissions in color were regularly diffused on national television. From this point onwards, consumers could see a steadily increasing number of programs in color, advertisers were able to present products in televised commercials in a different way, and the consumer electronics industry was provided with a new business opportunity. By using

internal company sources from color television set producers like Telefunken or Loewe Opta, as well as magazine advertisements from all three countries, this presentation traces how companies marketed the technological innovation of color television to consumers. Through a conjoint analysis of internal marketing plans and the argumentation and imagery used in consumer facing adverts, it is not only possible to understand how companies tried to advertise and sell color television sets within the framework of the media ensemble of the 1960s, but also why companies chose to position themselves in the way they did, and which steps they took in preparation for the official start of their marketing campaigns. This would for example involve briefing retailers over a year in advance on the points they were to address when speaking with potential customers about the question of color television. While an emphasis is put on Germany, parallels to the situations in France and Luxembourg will be drawn as well. Although the technological innovation manifested itself in the same way from the consumers' point of view – meaning that color was introduced to the medium of television –, the surrounding circumstances were decidedly different between the three countries. The industry players involved, the media situation, the adaptation rates of black and white television sets, and even the color television standards all differed significantly, which makes it a worthwhile endeavor to investigate the extent to which these economic, political, and societal factors influenced consumer facing advertising for color television sets. Moreover, it is also necessary to consider the impact of color television on the concurrently existing market of black and white television sets. According to Isabelle Gaillard, both products essentially occupied the same functional role within consumer households, but their positioning on the market was decidedly different, not the least due to pricing.⁴ Naturally, this also affected consumer advertising: as the technological novelty opened up new venues of argumentation for industry and retailers alike, the arguments used for black and white television sets were adjusted alongside it.

Matthias Höfer is a PhD researcher at the Centre for Contemporary and Digital History (C²DH) in Luxembourg affiliated with the Popkult 60 project.

He works with company archives and Luxembourgish, French and German advertisements for televisions, record players, cassette recorders and radios to understand how companies tried to popularize and to market these media artifacts to consumers in the «long» 1960s. His interest mainly lies within the field of media and communication history. He obtained his master's in history at the University of Bamberg in 2021 with a thesis about public rituals of penance in the 13th century, focusing on their role as public forms of communication and conflict-resolution in a semi-oral society.

“Conversion as transformation: Americanization of religion on radio in postwar Europe” (Timothy Stoneman)

This paper builds on an historical case study of the Protestant Voice of Europe, an American evangelical radio project to evangelize the subcontinent from North Africa during the Cold War. The European radio project formed a cornerstone of a global American evangelical imaginary, linking the region with evangelical broadcasters across the global south. Following initial attempts in Greece and Cyprus, American evangelical radio missionaries succeeded in establishing a Mediterranean beachhead in Morocco in 1954 under the direction of Baptist minister Paul Freed. Here, the *Voice of Tangiers* celebrated its position at “the gateway to three continents: Europe, Africa, and Asia.” Through the airwaves, the station sought to engage in authorized transgressions of the boundary between public and private space, creating an intimate public (Jason Loviglio) in listeners’ homes that would legitimize the cause of American evangelical religion. Building on scholarship in religious and media studies, the current paper constructs evangelicalism as a set of commercial media practices that connected American system of broadcasting with broader Americanization of popular culture in postwar Europe. In coordination with Billy Graham’s crusades in Western Europe (Uta Balbier), the paper describes how American evangelicals exported revival techniques and mass evangelism methods by radio as part of a comprehensive effort to promote individual conversions as moments of personal transformation that would, in aggregate, produce the rechristianization of the historic heartland of Christianity. Resistance to the

Americanized gospel message, however, along with government control of the electromagnetic spectrum in Europe, forced Freed to shift operational tactics, remaining perpetually on the outside edge of Europe. Freed first attempted to transmit on the commercial *radio peripherique* stations at France’s borders. Then, in a final move, Freed relocated operations in 1973 to the European colonial periphery (Netherlands Antilles), beaming powerful transmissions on shortwave to the European mainland. While limited in terms of conversion results, Freed’s efforts nonetheless proved central for the rhetorical claims of American evangelicals to spiritually transform Europe and thereby maintain the integrity of their global imaginary by radio.

Timothy Stoneman is a cultural historian of technology who specializes in the histories of communication technology, religion, and globalization. He holds his PhD. from the Georgia Institute of Technology (2006) and has previously held research and teaching positions at MIT and Clemson University. He currently works in the School of History and Sociology of Georgia Tech-Europe, the European Campus of the Georgia Institute of Technology, where he teaches courses in the European and American histories of technology and culture. He has published peer-reviewed articles and book reviews in numerous scholarly journals, including *Technology and Culture*, *History and Technology*, *New Global Studies*, *Journal of American Studies*, *Church History*, and the *International Bulletin of Missionary Research*. He has also published in French in *Le Mouvement Social*. In 2020, he co-edited a special volume of *History and Technology* on religion and technology and is currently co-editing a volume of the French journal *Artefact* on techniques and temporality. His monograph project is entitled *God in the box: Imagining American evangelical religion, radio, and reception in the global south, 1920-1970*.

Transforming video games into museum objects: issues and challenges (Ewa Swietlik)

Video games, defined as technological productions, may be studied as representations of social, cultural, and economic conditions typical of given societies and periods in time (Sotamaa 2014). When placed in museum

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exhibitions, they become “material or software artifacts” in the form of consoles, controllers, storage media, and playable games, while continuing to function as “cultural artifacts” and proof of ongoing technological changes (Nylund 2018). These three aspects of video games are combined by Nylund (2018) in the matrix model consisting of object, experience, and context to help professional curators and amateurs make informed decisions when designing video game exhibitions. The model distinguishes forms of context: play, game development, and public receptions. More recently, Harrington (2023) also added new categories in the field of experience: playable, collective, and situational. While both argue the validity of their ideas, it seems that their models have not yet been fully utilized in many museums. Transforming video games into museum exhibits is not a straightforward task, as shown by years of museum attempts and long-lasting discussions among various researchers (see, e.g., Barwick et al. 2011; Naskali et al. 2013; Swalwell 2013; Guins 2014; Newman & Simons 2018; Eklund et al. 2019). Based on case studies and research fields in video game museums in Poland, Germany, and other countries in Europe, the purpose of this presentation is to analyze the tensions at stake and how video games are interpreted in video game and computer museums, in contrast to the understanding that prevails in the academic field. What elements drive game exhibition and collections in private video game and computer museums, taking into consideration characteristics like limited space, lack of resources, and museal competencies? (e.g., the Museum of Electronics, Consoles, and Computers in Krakow)

Ewa Swietlik is a PhD candidate at the Centre for Contemporary and Digital History (C²DH) in Luxembourg, conducting a study on various video game exhibitions in museums and video game history under the supervision of Prof. Valérie Schafer. The purpose of this research is to contribute to a general understanding of the approaches and practices of video game museums in creating narratives about the history of video game in these specific institutions. She holds MSc in IT - Communication and Organization program from the University of Southern Denmark and MA in History from the University of Warsaw. Her second master thesis in digital studies

explored modern museums as digital communicators on the base of their online practices during the period of forced lockdown. While writing her first master thesis in the field of historical studies, she explored selected cases of 19th-century World Exhibitions through the Polish press.

10:30-11:00

Coffee break

Location: GD Aula

11:00-12:30

6.1 Fundamental Changes and Surprising Continuities: Military Technologies in Central Europe’s “Long Transformation”

Location: GD Hs3

This panel takes military industries and military technologies to posit a long transformation in Central Europe, starting before 1989 and with shared characteristics on both sides of the Iron Curtain. Focusing on arms dealers, military cadets, soldiers on deployment, and the members of the public who read about and interacted with them, it locates transformation processes in some of the changing ways in which military actors engaged with the technologies they had at their disposal. It also highlights the importance of military actors and institutions—frequently assumed to be a bastion of conservatism—in the unleashing and subsequent shaping of processes of transformation. Together, these three papers show the truly global connections maintained by military actors in Central Europe by the late Cold War. They also capture the distance between official statements about military materials and the lived realities of their handling which characterized the “long transformation” period, both in the East and in the West.

Austria as intermediate dealer of Warsaw Pact weapons. Arms scandals and their treatment in Austria (Mojmír Stránský)

Austria played a special role in trade relations between the blocs during the Cold War. Several factors were decisive here. Firstly, neutrality declared in 1955, while interpreted as non-alignment, nevertheless gave Austrian companies access to Western know-how and Eastern European markets. Secondly, the cultural and historical proximity to the countries of the former Habsburg monarchy shaped technology transfers and trade networks. Thirdly, the strong presence of international institutions in Vienna, such as the UN, OSCE and OPEC, meant that Austrian companies often acted as middlemen. This in turn triggered debates about whether the deals they brokered were compatible with Austrian neutrality. The way politicians and the media interpreted these "scandals" are the subject of this paper. In particular, I examine the furor surrounding one sale of Czechoslovakian weapons to the South African apartheid regime in 1987 to show changing public discourses on weapons technologies and the ethics of their sale.

Mojmír Stránský studies Eastern European history at the Institute for Eastern European History at the University of Vienna. His research interests include History of Central and Eastern Europe; Cold War; Oral History; History of Transformation 1989, Voluntarism

Weapons Training at Brno's Military Academy as a Venue for Socialist Internationalism (Rosamund Johnston)

This paper considers how a schooling in Czechoslovak arms was understood by functionaries in late-socialist Czechoslovakia to serve equally as a schooling in socialist politics. It therefore reconstructs the complex networks of expertise, maintenance, and dependence that accompanied sales or gifts of Czechoslovak weapons overseas. Focusing on Brno's Vojenská Akademie Antonína Zápotockého (VAAZ—The Antonín Zápotocký Military Academy), it charts how weapons training became a site of socialist internationalism in practice, also bringing some of this project's contradictions to the fore. Using memoirs, oral histories, and VAAZ periodicals, it asks how instructors and international students viewed these same exchanges themselves. It then

seeks to understand how these complex networks of expertise, maintenance, and dependence—built around technology and training—began to transform as Czechoslovakia shifted its geopolitical allegiances around the time of the Velvet Revolution in 1989.

Rosamund Johnston is a postdoctoral fellow at the Research Center for the History of Transformations (RECET), University of Vienna. She is the author of *Red Tape: Radio and Politics in Czechoslovakia, 1945-1969* which will appear with Stanford University Press in March 2024. Her research has been published in *Central European History* and a number of edited volumes. She has also written for the *Journal of Cold War Studies*, *East Central Europe*, *Harvard Ukrainian Studies*, Scottish newspaper *The National*, and public broadcaster Czech Radio. Johnston is the author of one book of public history, *Havel in America: Interviews with American Intellectuals, Politicians, and Artists*, released by Czech publisher Host in 2019. She is currently researching the global history of Czechoslovakia between 1954 and 1994 through its arms trade.

From elite military unit to expensive state construction company? The Transformation of Czechoslovakia's "Railway Military" (Tomáš Nigrin)

When the Warsaw Pact was founded, the Czechoslovak military (as that of a "frontline" state) was allocated the specialization of navigating through terrain damaged by military operations, and restoring crucial supply routes, all within an environment tainted by nuclear fallout. For this purpose the Czechoslovak army developed particular skillsets, and it was decided to centralize these within a specialized "Railway Military". However, during the late socialist period, characterized by persistent financial constraints, the „Railway Military“ underwent a transformative shift. Due to its ability, capacities, and the surfeit of men in this unit resulting from compulsory military service, the „Railway Military“ was used ever more frequently as a straightforward construction company for many civilian engineering projects. This shift in employment, driven by the enduring scarcity of labor across diverse sectors of the economy, exacerbated—as this paper reveals—some of the problems of a centrally planned economic system.

Tomáš Nigrin studied Area Studies, German Studies and Modern History at the Charles University in Prague, Free University Berlin, Humboldt University Berlin and Heinrich Heine University Düsseldorf. His research interests cover German post-war history, current political development in Germany and history of transportation. He has participated in many national and international research projects, and spent two months in 2022 as a research fellow at the Research Centre for the History of Transformations at the University of Vienna. He is currently working on an international FWF-GA ČR project *Linking Arms: Central Europe's Weapons Sector, 1954-1994*.

6.2 Urban Infrastructure and the Politics of Needs

Location: GD Hs8

Since the 19th century, expanding cities in Europe and elsewhere have invested heavily in the expansion and maintenance of urban infrastructures, such as water and gas supply, district heating and the like, deeply transforming the ways in which societies and individuals engage with their environments and satisfy their basic needs. Discourses about these human needs have accompanied the life of these infrastructures – from 19th century philanthropic ideas of hygiene and progress to late 20th century worries about infrastructural vulnerability and threatened energy security. Urban infrastructures were not simply meant to satisfy certain needs by providing various services. Rather, negotiations of infrastructures and human needs inevitably involved larger questions about human nature (What is a real need? What are mere wants?), about social order (Who needs what, and how much? What is an appropriate standard of living?), and the quality of life.

The panel Urban Infrastructure and the Politics of Needs examines these discourses about urban infrastructures and human needs through three case studies spanning the 19th and 20th centuries. Focusing on water supply, air conditioning and domestic heating, the case studies follow actors involved in the planning, construction, governance, maintenance, and use of these infrastructures and asks how they have negotiated the relation between

urban infrastructures and human needs. The panel thereby links to recent trends in the history of technology, which has turned to notions of maintenance, repair and care in studying infrastructure. While this strand of research has mostly been concerned with how specific infrastructures themselves are maintained at a technical level, the contributions to our panel addresses a more fundamental question. Focusing on human needs, we ask what it is that infrastructures are meant to maintain on a sociocultural level.

Organization: Fabian Zimmer

Chair & Comment: Melanie Arndt

Infrastructures of Care: Water supply and the negotiation of needs in Berlin 1852–1920 (Fabian Zimmer)

This paper explores the co-construction of material infrastructures and knowledge and ideas about human needs, using Berlin's early water supply system as a case study. When the city of Berlin started to install a centralized water supply system in 1852, these infrastructures were called "Wasserversorgung" – the German word "Versorgung" implying "Sorge", i.e. care. In pamphlets celebrating the new system, "Versorgung" was closely linked to improvements in the way the infrastructure satisfied human needs, by improving health, eliminating drudgery, and overall providing the comforts of a civilized standard of living. Based on published as well as archival materials from the Berlin Waterworks Company founded in 1852 and succeeding organizations up until the 1920 Greater Berlin Act, I trace how engineers, hygienicians and politicians, as well as everyday users of the infrastructure negotiated ideas about care and human needs.

Fabian Zimmer is a postdoctoral researcher at the Department for the History of Technology at Technische Universität Berlin. He works at the intersection of cultural history, environmental history and history of technology. After studying history and German philology at the universities of Heidelberg and Lund, he earned his PhD from LMU Munich in 2020. His first book *Hydroelektrische Projektionen. Eine Emotionsgeschichte der Wasserkraft im Industriefilm* was published with Wallstein Verlag in 2022.

His current research focuses on a discourse and knowledge history of “technology acceptance” and on an environmental history of comfort and human needs.

Air Conditioning and Expectations of Domestic Comfort in Post-War America (Jan Hansen)

This paper explores the adoption of air conditioning in 1940s–1950s America, with a focus on middle-class urban California as a pioneer in household electrification. Examining the interplay of air conditioning with post-war population growth, suburbanization, and consumerism, the study investigates the relationships among businesses, advertising firms, and consumers in popularizing this appliance. Housewives, grappling with lower temperatures, are central figures in this story. The paper contends that air conditioning functioned as a proxy for negotiating individual and collective needs in post-war America, particularly through the lens of women’s letters to manufacturers. These correspondences illuminate the societal discussion of ideals related to room temperature and humidity, portraying air conditioning as a means for Californians to navigate domestic comfort expectations and reaffirm their roles as housewives, parents, and confident consumers during this transformative period.

Jan Hansen is a DAAD Associate Professor in the Department of History at the University of California, San Diego. Specializing in the history of the United States and Europe in the 19th and 20th centuries, he is completing a book manuscript that explores the role of infrastructure in shaping conceptions of social order after 1850. In his prior work, he has researched the history of the Cold War, focusing on anti-nuclear protests in West Germany during the 1980s.

“Cold Comfort for the Poor”: Fuel Poverty and the Politics of Needs in Western Europe in the 1970s and 1980s (Damiana Salm)

Under the impression of two energy crises and a deep recession, a new public awareness of the social costs of energy consumption emerged in Western industrialised societies in the 1970s–1980s. In Great Britain and other parts

of Western Europe, the significant, albeit temporary, increase in energy prices meant that an increasing number of British households could no longer afford the energy they needed to satisfy their basic human needs, such as warmth through heating, etc. Driven by voluntary organisations like the *National Fuel Poverty Forum*, politicians, and social scientists in Britain, the term “fuel poverty” was coined for this phenomenon during the same period. Using public records from various government departments as well as unpublished documents from voluntary organisations across Britain, the paper examines how ‘fuel poverty’ was established as a political and social issue in the 1970s–1980s and it connects its emergence to an overall crisis of the British welfare state at the end of the post-war boom.

Damiana Salm is a Ph.D. candidate in contemporary history at the Albert-Ludwig University Freiburg i. Br., Germany. Her project, *Fuel Poverty and the Crisis of Welfare in Western Europe in the 1970s and 1980s*, focuses on the issue of ‘fuel poverty’ from a historical perspective, specifically exploring the interconnections between poverty, energy consumption, and welfare within Western Europe at the end of the “Golden Age” (Eric Hobsbawm) of post-war economic boom. She holds a B.A. in German Language and Literature and History from the University of Berne, Switzerland, and an M.A. in Comparative History of the Modern Era from the Albert-Ludwig University Freiburg i. Br., Germany.

6.3 New Perspectives on Nuclear Culture

Location: GD 102

In his ground breaking 1985-book, *By the Bomb’s Early Light*, Paul Boyer poignantly noted how the fields of cultural and intellectual history had somehow overlooked the pervasive influence of the “The Atom” on US society. With Boyer’s monograph, this would soon change. In the decades that followed, historians set out to examine how nuclear weapons, atomic energy, and radioactive pollution shaped societies, discourses, images and

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cultures. Initially focused on the Anglo-American world,¹ more recently, scholarship on nuclear culture has diversified and extended beyond the great powers to reveal how the atomic age informed global cultures, geographies and temporalities since 1945 in new perspectives. With this panel, we bring together scholars working on themes of nuclear culture through several different perspectives and geographies. The papers cover arenas of science, diplomacy, medicine and energy from both pro- and anti-nuclear sentiments, in diverse nations ranging from Germany, Denmark, the United Kingdom, North and South Korea and Japan. Our aim is to bridge geographic separations, to narrate how nuclear technology fundamentally changed human societies over the last eight decades. With this panel, we are poised to showcase new and emerging research and perspectives within the field of nuclear culture. Together, our scholarship highlights the fundamental cultural and societal transformations that occurred in both the mentalities and discourses as well as in the materialities and infrastructures, brought about by nuclear technology and its global circulation. By discussing the themes of democratic cultures, 'Media Publics', knowledge transfers, postcolonial settings, and energy policies, this panel addressed how nuclear energy and technologies helped compose global cultural and societal trends from 1945 until the present.

Chair: Karna Kalmbach

Imaginations of Nuclear Weapons as portrayed in 'Media Publics' – The Pacifist Movement and the National Security Actors in Post-War Denmark (Aske Hennelund Nielsen)

Within the research on nuclear culture, certain terms like the "Public", "National", "Mass Media", and "Popular Culture" have been widely accepted as analytical concepts to study the societal and cultural impact of nuclear energy post-Hiroshima and Nagasaki. However, these terms are far from unambiguous, and their uncritical use may cloud historical developments by

applying a monolithic approach to how groups and societies encountered the advent of "the Nuclear Age".

In this paper, I introduce the concept of 'Media Publics', to showcase a new approach to studying imaginaries of new technologies and their societal impact. Using the case of the Danish Pacifist Movement and the 'National Security Actors' and their conflicting perceptions of nuclear weapons in post-war Denmark, I highlight how communities have internalized, discussed, extended, ignored, or rejected new technologies based on the prevailing social norms and values as well as discourses and historical understanding of their groups.

Nuclear Decisionmaking and the Conditions of Democratic Debates – The British and German Examples (Christian Götter)

This paper draws on examples from Germany and the United Kingdom to argue that their respective nuclear cultures were deeply intertwined with the countries' democratic cultures – the way historical actors, from individual citizens to industrial actors and the governments, interacted with one another in the process of deciding about nuclear power. It demonstrates that British nuclear culture rested on an open, democratic foundation. This led to early, extensive, and critical debates about the technology, which came to be widely accepted because of them. In Germany, on the other hand, a closed, more hierarchical democratic culture resulted in attempts by actors from the industry, administration, and governments to exclude divergent opinions from the debates. This, in turn, resulted in the technology's critics searching for alternative ways of making themselves heard – and in a protracted conflict about nuclear power, dominating the country's nuclear culture to this day.

Citizens of Science: Cold War Nuclear Knowledge Transfers in 1950s North and South Korea (Derek J. Kramer)

¹ Hogg, Jonathan and Christoph Laucht: "Introduction. British Nuclear Culture". *The British Journal for the History of Science*. 2012. Volume 45, number 4. 479-493.

North and South Korea's postcolonial atomic science problem was strikingly similar: the field held the promise of a sovereign future, but only through the patronage of new Cold War hegemony. For either of the Koreas to access this seemingly revolutionary form of energy, a vast amount of scientific knowledge and technological capacity had to be conveyed from the Soviet Union and United States. This paper examines the tensions present in this exchange by examining the construction of North and South Korea's first nuclear test reactors. While these transfers were explicitly asymmetrical, they were not always perceived as indicative of an uneven relationship. In postcolonial settings like North and South Korea, universalizing assumptions about science helped broker novel forms of Cold War identity. This is modelled through a discussion of how science popularizers in both polities presented the Soviet Union and United States not as patrons, but as developmentalist vistas.

Conflicting nuclear cultures in early post-war Japan (Kristín Ingvarsdóttir)

Much has been written about Japan's nuclear policy since 2011, when Japan suffered the worst nuclear disaster that the world had witnessed since Chernobyl. For obvious reasons, most studies explore the urgent problems that the nuclear industry faces today. This paper, however, is mainly interested in how Japan adopted nuclear power in the first place. Paradoxically, Japan started down the path toward nuclear energy just a decade after the atomic bombings of Hiroshima and Nagasaki, amidst a spike in anti-nuclear sentiment throughout the polity. How did Japanese opinion leaders present the country's energy future at the time? To answer these questions, the paper presents the results of an in-depth content analysis of discussions about energy policy – and energy options – in Japanese print media around two key milestones: the enactment of the Atomic Energy Basic Law in 1955 and the opening of the first nuclear power plant in 1966.

Kristín Ingvarsdóttir completed her Ph.D. in Social Sciences from Hitotsubashi University in Tokyo in 2006 and a master's degree from the same university in 2002. Kristín joined the University of Iceland as Assistant Professor of Contemporary Japanese Studies in 2019. She teaches courses

on Japanese modern history and society. Her current research interests include the history of Icelandic-Japanese relations; Japan's engagement with the Nordic countries and the Nordic Arctic; as well as other aspects of Japan's international affairs.

Maintenance and Repair: A Multidisciplinary Conversation about an Emerging Field

6.4 Maintenance and Repair: A Multidisciplinary Conversation about an Emerging Field

Location: GD 202

In recent years, scholars within the humanities and social sciences have become increasingly interested in the study of maintenance, repair, and care. Despite many different topics and a large diversity in approaches and methodologies, this scholarship shares one important characteristic: a critical stance or outright rejection of narratives that only focus on innovations, inventions, and hypes. Much has happened since David Edgerton famously criticized the societal obsession with rapid succession of 'new' innovations in 2008, instead calling for a "shock of the old." A group of researchers in the US called The Maintainers, founded by Andrew Russell and Lee Vinsel, has particularly inspired social science and humanities scholars to study the consequences of not having a "maintenance mindset" in our technology-dominated world. Just the past two years have seen research booming in Europe as well, with publications from Stefan Krebs and Heike Weber (2021), Jerome Denis and David Pontille (2022), Per Högselius (2022), and many others. The Tensions of Europe community remembers well the keynote of Andrew Russell in Aarhus in 2022. The fact that interest in these issues will only continue to increase is proven by the next Annual Meeting of SHOT in Chile, which has repair as the central theme. As research is advancing fast, it is essential to push the pause button, evaluate the current state of the scholarship, and look ahead. Which important topics should we study? Which blind spots (regions, epochs, technologies, comparisons, etc.)

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have we missed? What kind of approaches and methodologies can help us? Why is it even essential to study maintenance, repair, and care in 2024? That is the aim of this roundtable. More specifically, the themes we will discuss are the following:

- Interdisciplinarity, interprofessional dialogue, and how History, Philosophy, Geography, and STS can contribute to maintenance and repair studies
- Labor and the people who do maintenance work, often at low pay and low status
- How maintenance practices are related to underlying ontological conception
- The ambiguity of maintenance/repair practices being both sustaining and transforming
- Political processes that impact artefacts and maintenance/repair
- The connection with production and disposal
- The costs of certain maintenance practices and deferred maintenance as a “slow disaster”
- The importance of academics working with industry professionals
- The resonance of maintenance for people from all walks of life and cultures
- Challenges regarding methodology and research communication

A diverse, international, and multidisciplinary group of scholars will answer these questions:

Andrew L. Russell is a Professor of History and Deputy to the President for Strategy & Planning at SUNY Polytechnic Institute in Utica, New York, and co-director of The Maintainers, a network of scholars and professionals focused on maintenance, repair, upkeep, and the everyday labor that keeps the world going. He is the author of *Open Standards and the Digital Age: History, Ideology, and Networks* (2014), and co-author of *The Innovation Delusion: How Our Obsession with the New Disrupts the Work that Matters Most* (2020) and *Circuits, Packets, and Protocols: Entrepreneurs and Computer Communications, 1968-1988* (2022). Russell serves on numerous community and professional advisory and editorial boards, including for the scholarly

journals *Technology & Culture* and *Internet Histories*. In 2022, he held a keynote at Tensions of Europe on his work for The Maintainers.

Heike Weber is a Professor of History of Technology. She has worked on 20th-century everyday technologies such as household appliances or mobile devices, and more recently, is studying the history of waste, recycling, and repair. Her research focuses on the use and re-use of technology and explores how people, industry, and society treat and eventually discard aged and used stuff – from obsolescent machinery up to daily wastes. Together with Stefan Krebs, she recently published the book *Histories of Technology’s Persistence: Repair, Reuse and Disposal* (Bielefeld: transcript, 2021, <https://www.transcript-open.de/isbn/474>).

Mark Thomas Young is a Marie Curie Postdoctoral Fellow in the Philosophy Department at the University of Vienna. His research covers two fields: the Philosophy of Technology, where he focuses on practices of maintenance and the use of automated technologies, and the History and Philosophy of Science, where he explores instruments, craft practices, and tacit knowledge in the early modern period. He is the founder and co-chair of the special interest group “Maintenance and Philosophy of Technology” at the Society for Philosophy of Technology (SPT) and co-editor of the forthcoming anthology *Maintenance and Philosophy of Technology: Keeping Things Going* (Routledge 2024).

Martin Meiske is a postdoctoral researcher at the Research Institute for the History of Science and Technology of the Deutsches Museum in Munich and a lecturer at the Karlsruhe Institute of Technology. He studied history and German philology in Potsdam, Zurich, and Bern. Meiske visited Buenos Aires as a Marie Curie Fellow in 2014 and was a doctoral fellow at the GHI Washington in 2017. He earned his Ph.D. at the LMU Munich/Rachel Carson Center in 2019. His current research project, *Cultures and Costs of Maintenance: The Rise of Creosote and its Precarious Legacy*, combines research perspectives from the history of technology (such as on maintenance and repair) with environmental and material history. Among his most recent publications is the edited volume *Beyond the lag and the Field: Infrastructures as Places of Knowledge Produktion Since the Late*

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Nineteenth Century (edited with Eike-Christian Heine), published in 2022 by the University of Pittsburgh Press.

Lena Enne studied Geography and Urban Design in Vienna, Prague, and Hamburg and has worked as a project coordinator at the intersection of urban research and artistic practice at the ZK/U – Zentrum für Kunst und Urbanistik in Berlin. Since April 2022, she has been a PhD student at the DFG Research Training Group "Urban future-making: Professional agency across time and scale" at HafenCity University Hamburg. In her PhD project, she explores the maintenance and repair of Hamburg's historically evolved supply infrastructures in the context of past and current transformation processes.

The chair of the session is **Siegfried Evens**. He specializes in the history of risk and disaster. By the time of this session, he will have defended his PhD thesis entitled *Streams, Steams, and Steels: The Governance of 'Nuclear' and 'Non-Nuclear' Risks*, in which he researches the history of nuclear safety governance in the US, France, and Sweden with a focus on water and cooling systems. In this research, Evens explores different inspection and maintenance practices and the ways these are regulated. His project is a part of the ERC-funded NUCLEARWATERS project, under the supervision of Per Högselius, which tends to rewrite the history of nuclear energy with a focus on water. He has worked previously on the fire and mining risks.

6.5 Sustainability's "Other": Exploring Resource-Efficient Practices in the Shadow of Eco-Modernism

Location: GD 203

In most public and also academic discourses on sustainability, the term is framed in a narrow, eco-modernist and Western-centric way. These discourses typically revolve around technologies, policies or practices that can foster an implicitly future-oriented transition to sustainability. However, these discourses tend to turn a blind eye to long-established and socially embedded sustainable practices that exist all over the world, as we argue in this panel. In a political discourse that is dominated by economic ("green")

growth paradigms such practices are overlooked and marginalized, for example, because their underlying motivations are non-economic (e.g. household food production and inter-household food sharing) or because they take place in the context of an informal or weakly regulated economy (e.g. two and three-wheeled transport in South or South-East Asia). Oftentimes, actors themselves do not associate these practices with sustainability, but with pragmatic reactions to a relative scarcity of resources and capital (typically framed as "poverty") or with the desire for effective use of available resources combined with enjoyment.

In this session we aim at de-centering and pluralizing framings of sustainability. We make the case for identifying and valuing already existing sustainable practices and the historical legacies they build on. For this purpose, panelists present dense, place-based and temporality-sensitive accounts of sustainable practices in China, Mexico, India, Kenya and late Soviet Uzbekistan. They illustrate how these practices have evolved over time; bringing to the fore the social diversity of the actors involved, as well as the material, social and cultural repertoires these actors draw upon. We will discuss the implications of marginalizing these practices in discourses on sustainability transitions. Finally, we will also discuss how we, from our respective disciplinary perspective, can and should engage with "sustainability", a term that is problematic as an analytical concept, but also allows us to connect our research to key societal debates of our time.

Organisers: Jonas van der Straeten, Petr Jehlička

Discussant: Erik van der Vleuten

Chinese home and guerrilla gardening: The importance of preventing the loss of already existing sustainability (Petr Jehlička)

Drawing on the exploratory study of urban gardening in China, this paper argues that sustainability scholarship and policy will accelerate both insight and action by embracing a greater diversity of the notions of sustainability. This will open the door to less formalised approaches that require greater attention to actually existing sustainability rather than privileging innovation. Among other things, this reduces the policy-share burden placed upon

promises and plans sketched out in an idealised future, and pays credit to everyday behaviours and routines at present. These latter sustainable practices are vulnerable to devaluation (Mincyte 2011) or oversight, and this paper's novel findings regarding the situation in China point to the risk of their disappearance. Thus in this paper, we wish to highlight the *sustainability gains* that are motivated not by learned intentionality but rather associated with already existing, informal practices and everyday behaviours that happen to bring sustainability benefits. More importantly, we also wish to redirect attention to the implications of possible *sustainability losses* caused by the diminishing or disappearance of these sustainability-compliant existing behaviours. This risk is vividly documented by the authorities' efforts to make informal food self-provisioning practices in Chinese urban environments difficult. It is important to recognise that the losses in terms of sustainability outcomes due to the disappearance of these behaviours may significantly outweigh the gains brought about by sustainability innovations favoured by the authorities.

Petr Jehlička is a senior researcher in the Department of Ecological Anthropology of the Institute of Ethnology and in the Department of Local and Regional Studies of the Institute of Sociology of the Czech Academy of Sciences in Prague. His research, initially focused on East European environmentalism, evolved to explore the 'Europeanization' of environmental governance in new EU member states. Under the Quiet Sustainability project, he examined sustainable food practices in Eastern Europe, proposing a new concept of exuberant and socially diverse sustainability. His collaborative project with Masaryk University focuses on alternative economic practices in the Czech Republic. Petr holds a Masters degree in Geography from Charles University, Prague and a PhD in Social and Political Science from the University of Cambridge.

Reimagining Innovation Paradigms: Electric Rickshaws in India and the Potential of Bottom-Up Approaches in Sustainable Mobility (Vikas Bagde)
Based on a case study on electric rickshaws in India, this paper makes a case against the prevailing innovation paradigm, known for its arrogant, top-

down, technocentric approach that has led to environmental degradation. The study advocates for a paradigm shift towards bottom-up innovation (BUI), driven by intrinsic motivation within users & communities. Through primary data analysis, my research reveals how BUI enables the utilization of local resources, minimal reliance on intricate supply chains. The minimalistic and frugal approach of BUI practitioners fosters optimal use of locally available knowledge and material resources, thus rendering practices inherently sustainable. These findings highlight BUI's adaptability to hyperlocal conditions, offering tailored solutions to entrenched social challenges. Moreover, this research investigates the role of narratives in the innovation and diffusion processes of bottom-up mobility innovations. It stresses the significance of user-driven innovation and emphasizes the necessity for continuous, incremental improvements. By expanding the discourse on sustainable mobility systems, this study underscores the transformative potential of bottom-up innovations in reshaping the prevailing mobility paradigm. Overall, this research contributes to a comprehensive understanding of innovation's contextual applications, particularly in fostering sustainable mobility solutions

Vikas Bagde is currently a PHD Researcher at the University of Amsterdam, where he has been engaged since January 2022. His research focuses on the current challenges in mobility innovation, aiming to identify and explore potential solutions. Specifically, he is intrigued by the recent emergence of Electric Rickshaws (ER) in India, viewing it as a compelling case of bottom-up and frugal innovation. Bagde's work seeks to contribute to understanding and addressing issues in the development and diffusion of mobility innovations.

Commodity or Kin: Corn, Sovereignty and Habitable Futures in Mexico
(Madeline Greenwood)

Food systems reveal the intricate connection between humans and nature, underscoring our mutual interdependence. Industrialized agriculture highlights the current state of unsustainability, causing harm to communities and ecosystems, jeopardizing global food security. In response, many

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communities embrace principles of food sovereignty, advocating for culturally relevant, community-led, environmentally regenerative, and diverse agricultural systems. In Mexico, initiatives focused on saving (and defending) native maize seeds serve to resist U.S. imperialism and contribute to biocultural diversity. Seed saving becomes more than resource management in this context; it symbolizes the continuity of the region's diversity and resistance against narratives and policies introduced by the Green Revolution. This research aims to understand how claims to food sovereignty, particularly through native maize, can shape a just and sustainable future of food by integrating science and Indigenous knowledge. Exploring corn as both an economic and relational entity, this study adopts a multispecies approach in reimagining the entanglement of human and nature, moving beyond sustainability towards habitability.

Madeline Greenwood is an environmental anthropologist, activist, and farmer. She is passionate about creating sustainable food systems by supporting communities' stewardship of land and knowledge related to biodiversity, cultural practices, and food. Originally from Canada, Madeline has a background in environmental science from McGill University where she began focussing her research on Indigenous Food Sovereignty. She continued this endeavor with fieldwork in Mexico, graduating cum laude with an MSc. Cultural Anthropology from Utrecht University, in the Netherlands. Madeline frames her work through an interdisciplinary lens, striving for solutions that honour a marriage of science and Indigenous wisdom, for more inclusive and regenerative movements toward sustainability.

Sustainability in Khrushchev's Shadow: Building and Improving one's own Home in late Soviet Samarkand (Jonas van der Straeten)

The Sovietization of Central Asian cities has been mostly written as that of a state-induced urban modernization process that turned Islamic cities into planned, socialist cities. The material constitution of cities like Samarkand, however, tells a different story. While the impacts of the mass housing campaign that began under Khrushchev remained relatively modest, a surge

in the regular and irregular self-help construction of private adobe brick houses shaped Samarkand's urban landscape. This paper provides a historical example of overlooked practices of self-help building, maintaining and improving houses in the shadow of Soviet mass housing. While the temporal focus of the study predates the ascent of *sustainability* as a global agenda, the paper unpacks one of the myriad of resource-efficient and creative practices that persisted or evolved on the fringes or outside of the Soviet command economy. It shows how residents of Samarkand made do in the context of the resource constraints, what technical and social resources they drew upon and what role they played in sustaining their cultural identity. These practices were typically dismissed as inefficient and "morally outdated" by Soviet planners and administrators and they are widely ignored in historical scholarship on the Soviet world. Since weakly regulated self-help building, has remained the prevalent form of house construction in many parts of the world, the paper asks for the actionability of a historiography on that topic.

Jonas van der Straeten is Assistant Professor at the Technology, Innovation and Society Group at Eindhoven University of Technology. In his research, he studies processes of technological change in Africa and Asia from a systemic, transdisciplinary, and global perspective. His major areas of interest are electricity, housing, and –more recently –mobility. Jonas has a track record both as a historian of technology and as a consultant for projects on energy access in countries of the Global South. He has worked as postdoctoral researcher at the University of Technology Darmstadt in the project "A Global History of Technology, 1850 –2000", funded by the European Research Council. He holds a PhD from the Darmstadt University of Technology.

'Outside the Box': Thinking through Sustainability by Exploring Alternatives to Nairobi's Obdurate Waterscape (Jethron Ayumbah Akallah)

Sustainability is one of the terms that have characterized development approaches both in the global North and South, especially in the post MDG age. However, it remains a fluid concept that calls upon scholars and

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practitioners alike to decenter its application and understanding. Like many things technological, infrastructures are adopted, mediated and appropriated within socio-economic, cultural and political contexts. By exploring modalities of water provisioning as imagined, pursued and practiced on Nairobi's fringes, this paper seeks to delineate the concept of sustainability. Relying on oral interviews, archival data and ethnography, the paper indicates that paucity, in this case of water occasioned by an obdurate colonial infrastructure system, sets into motion reactionary approaches that concern themselves with meeting immediate demands of water in its primacy as a basic human need. Survivalism rather than sustainable access becomes the *modus operandi* towards provisioning. However this is not to say that Nairobi's informal settlement slack innovativeness in their everyday experiences with infrastructures. Rather, such innovativeness unfurls by paying attention to the historical particularities of place and time so as to understand sustainability from the spectrum of specific peoples everyday lives experiences without promoting, in this context, exceptionalism of the South.

Jethron Ayumbah Akallah is a Lecturer in the department of History and Archaeology at Maseno University in Western Kenya. He holds a PhD in History of Technology from Technical University of Darmstadt, Germany. His research focuses on urban infrastructures in the Global South specifically but not limited to water and sanitation technology in Nairobi. Jethron pays special attention to innovations within informal areas and how infrastructures in Africa defy conventional ideals popularized in the North and propagated by global financial institutions and agencies. Jethron is the immediate former Chairperson of the Society of History of Technology (SHOT) Program Committee and holder of the SHOT International Scholars Award (2019/2020).

6.6 Waterways and Railways (individual presentations)

Location: GD 204

Making Waves: SINTEF and the Envisioning Technologies of the Ocean Space (Håvard Brede Aven, Pål Nygaard)

EU policies and business strategies are increasingly envisioning – and revisioning – the ocean as a key site for transitioning away from the fossil economy and into a blue economy of new business opportunities. This paper traces the efforts to conceptualise the ocean space – inspired by holistic approaches to the outer space – from the mid-1970s onwards, using the interplay between largescale marine laboratories and computer scientists at the Norwegian research institute SINTEF as a case. As a contact zone between a variety of maritime businesses (petroleum, shipping, aquaculture, offshore wind), research agendas and industrial and environmental policies, SINTEF's marine laboratories are ideal sites for exploring how the global ocean space has been constructed in specific settings: How have engineers and scientists devised and maintained tools for simulating, recreating, and managing the ocean environment? How have shifting uses of the laboratories reflected how different stakeholders have used and envisioned the ocean space? And how – if at all – have conflicting visions and interests been addressed?

Håvard Brede Aven is an associate professor of history at Western Norwegian University of Applied Sciences. He did his PhD (2021) on the role of engineering communities in environmental debates in post-war Norway.

Pål Nygaard is an associate professor of economic history at BI Norwegian Business School. He has worked on the history of engineering and technology, infrastructure, and business history. He is the PI of a commissioned history about SINTEF, Norway's largest independent research institute.

From Past to Present. Historical Development of ICT and Railway Systems (Marco Zivkovic)

The paper analyses the development of communication technologies and railway infrastructures, examining how vulnerabilities stem from historical growth and technical innovations. Both sectors entail technologies of different ages spanning decades. Like 'sediments of time', to speak with

Kosseleck's metaphor, they are layered on top of each other. Also, different contemporary conditions influenced the current shape of the networked infrastructures. Therefore, past developments and older technologies can heavily influence future infrastructure transformations. To gain a better insight into the influence of the past, 20 oral history interviews with practitioners from the ICT and railway sectors will be conducted. These experts first-hand experience(d) how the infrastructures developed in contemporary history, including which technologies got introduced, how the dissemination processes turned out, and which political, economic, and societal factors were inscribed into the systems. This experiential knowledge will be combined with quantitative data from an archive study.

Marco Zivkovic: 10/2015-03/2020 Bachelor studies History and Political Science at Technical University Darmstadt. 04/2020-03/2023 Master studies History with main emphasis on the History of Modernity at Technical University Darmstadt. 04/2023-current Scientist at LOEWE-Center emergenCITY/Section of Modern and Contemporary History, Technical University Darmstadt.

Testing the ice: Technical changes in sensing shaping ways through ice landscapes of the Baltic Sea, 1880-1939 (Johan Gärdebo, Saara Matala)

Modern countries made maps to take geographical space under human control. Societies dwelling on the coasts of the Baltic Sea were not an exception, but the nautical charts of the coastal and international waters were instrumental in demarcating national boundaries, facilitating transportation of people and cargo, and advising military strategies. However, the Baltic Sea was long only seasonally hospitable for human exploration, with condition changing vastly from summer to winter, as ice closed off navigation routes from navigation. In addition to the seasonal changes, the landscape was shaped also by sea currents, winds, and temperature. Therefore, mapping the winter sea proved difficult and risky, even well into the development of ice-capable vessels for traversing the icy waters. We study the emergence of ice research in the Baltic Sea region from the 1880s until the break out of the Second World War in 1939 as a case of

technological changes and interplays in sensing and shaping the Baltic Sea environment. This was a period of development of steel-framed steamships and icebreakers that enabled winter navigation, as well as sensing instruments that yielded comprehensive understandings of the sea ice and its dynamic transformation. In addition, these changes stimulated a transnational community for collecting ice information, standardisation of concepts and methods, and communication of ice information for merchant marines. During this period, the local observations and experience-based knowledge transformed into systematic scientific analysis and national projects were expanded through transnational cooperation. Technological development was a driver and enabler of this transformation. First, the development of marine engineering and industrialisation called for extended navigation seasons. And second, the development of observation technologies from human monitors and individual weather stations into systematic technology-aided data collections using icebreakers, airplanes, and radio transmission. The research is based on primary sources from the collections of Meteorological institutes in Finland and Sweden. It contributes to the Tensions of Europe conference theme by studying the “technologies as a driver of political, societal or environmental changes and as an obstacle”. The study contributes to our understanding of how changes in technology changed both how the Baltic Sea region was sensed and eventually also shaped as sea routes could be kept open for longer periods and enable more advanced sensing operations in turn.

Johan Gärdebo is a Research Fellow at Clare Hall (2023–2026), associated with the Cambridge Centre for History and Economics and the Department of History of Science, and a postdoctoral researcher of Uppsala University. He studies climate knowledge and decarbonisation policies as these interplay in local, national, and transnational settings, from late 1800s to the present. Gärdebo is currently collaborating on three research projects. Gärdebo's dissertation *Environing Technology* – awarded the 2021 IUHPST/DHST dissertation prize – traces how Sweden during late twentieth century used satellite remote sensing to promote ‘environment’ as a crisis

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concept, while helping to expand Swedish institutional affiliations, company products, and diplomatic priorities.

Saara Matala is an assistant professor of technology and society at the Chalmers University of Technology in Gothenburg, Sweden. Her research examines the long-term transformation of industries and technologies and their interaction with nation-states with a special expertise in the history of winter navigation. After gaining a doctoral degree in history of industrialization at Aalto University, Finland, in 2019, she has worked as a post-doctoral scholar in mobile platform security (Aalto University), natural resources (NTNU, Norway), and arctic maritime technology and economic nationalism (Chalmers, Sweden). In addition to ice research, her current research interests include deglobalization and industrial policy. Her first book, "History of Cold War Industrialisation. Finnish Shipbuilding Between East and West" was published by Routledge in 2021.

Creating Infrastructural and Political Bonds: How the European Railroad Network Shaped Prussia's Transition from an Absolute to a Constitutional Monarchy (Jan Musekamp)

In 1848, European railroads, for the first time, formed a network that contributed decisively to the spread of the revolutions. In Prussia, discussions on railroad financing added to ongoing debates on the King's accountability and the people's right to have a voice in state matters. The Royal Prussian Eastern Railroad (Ostbahn) was at the center of this debate. Seen as critical for the state's economic and military development, Prussia planned to build it as the first state-owned railroad. Still, the government lacked the funds for construction. Hence, the king aspired to issue state bonds – bonds that had to be approved by the United Diet, a Prussian proto-parliament. Ultimately, the funds were approved, but only after their initial rejection, the March Revolution, and the implementation of a Prussian constitution. This paper is based on extensive research I have conducted for my second book, which is coming out in March 2024.

Jan Musekamp is a visiting associate professor at the University of Pittsburgh/Pennsylvania (Department of History and European Studies

Center). Previously, he taught Eastern European History at the European University Viadrina and was a postdoctoral fellow at Washington University in St. Louis/Missouri. In his teaching and research, he focuses on Eastern European cultural and migration history in the nineteenth and twentieth centuries. His main areas of interest are questions of mobility, (forced) migrations, cultural appropriation in Eastern European borderlands, and transnational history. In his first book, Jan focuses on forced migrations and cultural appropriation in the Polish border city of Szczecin between 1945 and 2005. His second book is coming out with Indiana University Press in March 2024. In *Shifting Lines, Entangled Borderlands. Mobilities and Migration along the Prussian Eastern Railroad*, Dr. Musekamp analyzes the impact of the railroad on the development of international networks in nineteenth-century Central and Eastern Europe – amidst growing tensions between globalization and nationalism. His new research project focuses on the impact of the "global color line" on the migration of Ukraine's German speakers to Brazil, Canada, Germany, and within the Russian Empire.

12:30-13:30

Lunch break

Location: GD Mensa

13:30-15:30

7.1 Current and future transformations in the History of Technology.

An unconventional panel of lightning talks

Location: GD Hs3

This panel is set to delve into the current and future trends shaping the field of the history of technology. We face a highly transformative age, marked by environmental, societal, and geopolitical challenges, blurred boundaries

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between technologies and infrastructures, the promises (and risks) of AI amongst others, as well as shifts in the realms of research (development of “studies” like code studies, surveillance studies, maintenance studies, digital methods, datafication, transformations in publishing and curricula, open science, incentives to interdisciplinary projects, etc.). The role of repair and maintenance studies in the history of technology, approach through technodiplomacy, renewal in infrastructure studies, input of public and digital history, contributions of transnational and global approaches are some of the trends that currently shape the history of technology. However, this list is far from exhaustive of the multifaceted challenges and emerging trends in this ever-evolving landscape. The panel aims to highlight these key trends and challenges at the intersection of the ToE conference themes and will spotlight pivotal developments in methodologies and historical sources, research, and narratives, to contribute insights into the role of the history of technology amidst contemporary challenges. It will shed light on its significance in understanding and navigating the complexities of our time, offer fresh perspectives and ideas, emphasizing the crucial intersection between technological transformations and broader societal issues. The format of the panel features lightning talks, each lasting 5 minutes, ensuring concise and incisive presentations and discussions centered on specific points. We do not provide the details of each speaker’s contributions here to maintain the element of surprise for these very brief interventions/statements, as the goal is to stimulate reactions and a dynamic dialogue between the speakers and the audience. Representing diverse trends in technology studies and spanning several generations of scholars, the panel will include well-known figures from the Tensions of Europe community, including some of those involved in the ToE management through years and/or previous flagship projects. The session will start with reflections from Ginevra Sanvitale on discussions within the Early career scholars’ network during the summer school, paving then the way for contributions from these various colleagues. Structured in two parts to encourage audience engagement, the panel will be moderated by Valerie Schafer and ideally span a duration of two hours. The first part will feature

five speakers, Ginevra Sanvitale, Stefan Krebs, Benjamin Thierry, Aristotle Tympas and Pascal Griset, followed by a 30-minute discussion with the audience. The second part will mirror the format, allowing for further exploration of the issues by Erik van der Vleuten, Leonard Laborie, Dagmara Jajeńskiak-Quast, Andreas Fickers and Nina Wormbs. A short wrap-up talk will synthesize the key challenges identified throughout the discussion, offering a comprehensive conclusion and an opening to this forward-thinking and reflexive exercise.

Ginevra Sanvitale is a Postdoctoral Research Fellow at Trinity College Dublin, Centre for Digital Humanities. Her current research explores feminist methodologies and perspectives to analyse historical and contemporary implications of food industry automation for women’s labour, within the interdisciplinary Horizon Europe project MOZART. Her PhD project (Eindhoven University of Technology, 2022) investigated the political significance of emotions in the Italian history of computing. Since 2021, she is a member of Tensions of Europe’s Early Career Scholars Committee.

Stefan Krebs is an Assistant Professor for Contemporary History at the Luxembourg Centre for Contemporary and Digital History (C2DH). He studied history, political science, and philosophy at the universities of Aachen and Aix-en-Provence. He received his PhD in the history of technology from RWTH Aachen University. As a postdoc, Stefan Krebs worked on projects at Eindhoven University of Technology, Maastricht University, and the University of Luxembourg. His current research interests include the industrial history of Luxembourg, the history of deindustrialisation, and the history of repair and maintenance.

Aristotle Tympas works as professor of the history of technology in modernity at the Department of History and Philosophy of Science, National and Kapodistrian University of Athens (NKUA), where he also directs an anglophone program in STS. His historical/STS research and publications are focused on a critical understanding of artificial intelligence and renewable energy. He serves as Action Chair of an EU program on datafication and borders (DATAMIG, and as the NKUA coordinator of EU projects on ethics of

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technology education tailored to addressing major societal challenges (ETHICS4CHALLENGES, TETHICS).

Pascal Griset is a Professor of Contemporary History at Sorbonne University (UMR Sirice/CRHI), France. He was the coordinator and Principal Investigator of the H2020 project “Inventing a shared Science Diplomacy for Europe” (InsSciDE). A specialist in the economic and technical history of information and communication technologies, he is currently researching the history of scientific research organizations and high technology industries. He chairs the Comité pour l’histoire de l’INSERM.

Erik van der Vleuten has been serving as Professor and Chair of the History of Technology section at TU/e since 2015, and as scientific director of the Foundation for the History of Technology SHT. He was socialized in collaborative transnational research in the pan-European historical research community *Tensions of Europe* (as a co-founding member, project initiator/coordinator, Chair, and long-time management committee member). He also cochaired the *NW Posthumus interuniversity research school’s* global history network and the *European Social Science History Conference’s* history of technology program. His current focus is on the plural-yet-connected socio-material histories and futures of distant regions across the globe, and on combining notions of transnational, transformative and transdisciplinary historiography. In 2023-28 he leads the NWO Open Competition program *Soy Stories. Connected Histories and Futures of the global Soyacene*.

Léonard Laborie is a research fellow at the CNRS, UMR Sirice (Paris). Former chair of Tensions of Europe Research Network (2019-2022), he acted as the deputy coordinator for science/scientific advisor for the InsSciDE project (“Inventing a shared Science Diplomacy for Europe”). His research deals with the interactions between science, technology, and diplomacy in the making of Europe since the 1850s. His selected publications include: (with Bledniak S, Matamoros I, Virgili F) (eds) (2022) *Chroniques de l’Europe*. CNRS Editions, Paris; (with Arapostathis S) (2020) *Governing technosciences in the age of grand challenges. A European historical perspective on the entanglement of*

science, technology, diplomacy, and democracy. *Technology & Culture* 61(1):318-332.

Dagmara Jajeśniak-Quast heads the Center for Interdisciplinary Polish Studies (ZIP) at the European University Viadrina (EUV) and holds the Professorship for Interdisciplinary Polish Studies. She is the Head of the Viadrina Center of Polish and Ukrainian Studies. An economist and economic historian, she completed her habilitation on European history (with a focus on economic history) from the University of Siegen in 2013. She has researched and taught at ZZF in Potsdam, the University of Erfurt, the GWZO at the University of Leipzig and the NIAS in the Humanities and Social Sciences of the Royal Netherlands Academy of Arts and Sciences (KNAW) in Wassenaar. Since then, she is working in Frankfurt (Oder).

Andreas Fickers is the director of the Luxembourg Centre for Contemporary and Digital History (C2DH) at the University of Luxembourg since 2016. He is currently Professor for Contemporary and Digital History. He is head of the FNR funded Doctoral Training Unit “Deep Data Science of Digital History” (D4H) and he coordinates the Trinational doctoral school together with Prof. Dr Dietmar Huser (Universität des Saarlandes) and Prof. Dr Helene Miard-Delacroix (Université Paris-Sorbonne). He is also principal investigator of the projects Popkult60, LuxTime and BUREU. Furthermore, he is the editor of the *Journal of Digital History* and co-editor of the book series “Studies in Digital History and Hermeneutics” published by De Gruyter Oldenbourg.

Nina Wormbs is professor in history of technology at KTH Royal Institute of Technology, Stockholm. She has published on mediahistory and digitalisation but has increasingly worked with issues pertaining to environmental and climate change. A recent publication is “Model Time and Target Years: On the End of Time in IPCC Futures”, in *Times of History, Times of Nature* Ekstrom & Bergwik (eds.). Berghahn books. She has been involved in ToE since the early 2000s and in the Management Committee 2013-2019, as chair 2015-17.

Valérie Schafer (moderation) has been a Professor in Contemporary European History at the C2DH (Luxembourg Centre for Contemporary and Digital History) at the University of Luxembourg since 2018. She is also an

Associate Researcher at the Center for Internet and Society (CIS – CNRS UPR 2000). She specializes in the history of computing and data networks. Her main research interests are the history of the Internet and the Web, the history of European digital cultures and infrastructures and born-digital heritage (especially Web archives). She chairs the Management Committee of the Tensions of Europe network (2022- 24) and is a co-founder of the journal *Internet Histories. Digital Technology, Culture and Society*.

7.2 A Multivectorial Driver of Change. Techno-scientific Visions as a Factor of Mobilisation for Transformation

Location: GD Hs8

The panel intends to investigate the first theme “Technology as a driver of change” with a multidisciplinary approach. Gathering a wide range of different research experiences (including economic geography, engineering, science and technology studies, history), it will focus on three cases – nuclear power, air transport and satellite observation – during a time span from the intra-war period until today. The panel aims to investigate the conference’s theme on the hypothesis according to which the operational potential of a technology, together with concrete or perceived constraints, activate techno-scientific visions. These visions, in turn, serve functions such as agenda-setting and resource mobilisation. Experience and scholarship on nuclear power have shown that techno-scientific vision(s) remain somewhat contentious, inasmuch as they entail ‘tried and proven’ technologies on the one hand and radical transformation on the other, and they are globally very complex. Indeed, the wide variety of actors involved at local, regional and global level leads to conflicting priorities and, accordingly, to contradicting views on the nature and degree of the desired change. The realms of air transport and space activities seems to offer more straightforward results at first sight. The challenges of long-term economic development and environmental sustainability have led to the definition of distinctive regional identities – be it the French Occitania or the Polish Subcarpathia – whose industrial base has played an enduring role in the evolving configuration of

the techno-scientific vision of human mobility. Moreover, these regional identities bring to the fore the vital European dimension in the overall picture. Space activities have showed a huge mobilisation potential, sparking at times even rather naïve visions among the public at large. While being a crucial vector of international societal engagement by science diplomacy and a driver of change, space activities are far from unproblematic.

Discussant: John Krige

John Krige has a PhD in physical chemistry from the University of Pretoria (South Africa) and a PhD in the history and philosophy of science from the University of Sussex (Brighton, U.K.). He joined the Georgia Institute of Technology in 2000. Prior to that he directed a research group in the history of science and technology at the Cité des sciences et de l'industrie in Paris, and was the project leader of a team that wrote the history of the European Space Agency. Krige's research focuses on the intersection between science, technology and foreign policy. His most recent edited books all deal with knowledge circulation: *How Knowledge Moves. Writing the Transnational History of Science and Technology* (2017), *Knowledge Flows in a Global Age. A Transnational Approach* (2022). Krige also co-authored with Mario Daniels, *Knowledge Regulation and National Security in Postwar America* (2022).

The EU and the Ukrainian Nuclear Safety Issue, 1992-2004 (Mauro Elli)

The contribution investigates the crucial role the newly formed EU played in the realm of nuclear safety in post-Soviet Ukraine. Nuclear safety was considered at the European Council meeting in Lisbon in May 1992, so initiating the Nuclear Safety Account initiative launched by the G7 in Munich a few months later. Through the PHARE and TACIS programmes, by 1993 the EU was already the biggest contributor. The single most contentious issue was the shutdown of the surviving reactors at Chernobyl. Following the same pattern, the European Council meeting at Corfu in June 1994 initiated a package deal including the shutdown of Chernobyl in exchange for the completion of reactors under construction at Zaporizhzhia, Khmelnytskyi and Rivne. The nuclear issue, however, was bound to remain contentious throughout the 1990s and it represents a valuable vantage point to

investigate increasing Ukrainian complaints of being considered as a buffer against and a subordinate variable in relations with Russia.

Mauro Elli is an associate professor of Contemporary History and research director of the project *The long transition. Techno-political issues of renewable energy sources in Italy against the European Common context* financed by the Italian Ministry of University and unit leader in the national research project PRIN2022 *Nuclear deindustrialization. Human capital, business restructuring, and environmental change in Italy (1971-1999)*. His research interests deal with the reciprocal feedback between foreign policy and technology during the Cold War, notably nuclear power developments and the aviation industry; the role of scientists and experts in political decision-making processes; scientific diplomacy.

The Ambiguity of Techno-scientific Promises: Nuclear Technologies as Drivers of Change and Guarantees of Continuity (Markku Lehtonen)

This paper explores discourses, institutions, and materiality of nuclear energy through the lens of techno-scientific promising. In doing so, it to illustrate the multiple and partly contradictory roles of technologies as both drivers for and obstacles to transformative change. Combining past, present, and future, the paper illustrates this ambiguity through three cases. First, the launching of the massive nuclear programme in the mid-1970s transformed both the country's electricity supply system and its territories, while building on and guaranteeing the continuity of the nuclear sector and its institutions. Second, the fast breeder technologies, with their vision of closing the fuel cycle promised simultaneously discursive, institutional and material continuity and radical transformation by liberating humanity from its energy resource constraints. Third, the current promise of small modular reactors entails constant balancing between continuity and change that characterises techno-scientific promising– between the promise of disruptive change and that of “tried and tested” technologies.

Markku Lehtonen is an interdisciplinary social scientist, currently working at the Pompeu Fabra University (Barcelona) and at the Autonomous University of Barcelona. Markku is also adjunct professor at the University of Jyväskylä,

Finland; associate researcher at the Groupe de Sociologie Pragmatique et Réflexive (GSPR), Ecole des Hautes Etudes en Sciences Sociales (EHESS) in Paris; and Associate Faculty at the Science Policy Research Unit (SPRU), University of Sussex. His research focuses on policies and governance in the areas of energy, environment and sustainability. His current research projects investigate nuclear-sector promises and epistemic communities in Canada, Finland, France, Sweden, and the UK (the PROMISES project, funded by the Kone Foundation), and sustainability in educational institutions in Finland, Portugal, Romania, and Spain (the EU-funded ECF4CLIM project).

The Uncertainties of Nuclear Decommissioning: Extended Dialogue, Contested Visions (Davide Orsini)

What happens when nuclear power plants (NPPs) and facilities cease to operate? What are the environmental, safety, and economic implications of cleaning up and safely disposing of nuclear sites? Overshadowed by inner and post-accident safety issues, these questions are still relevant today but rarely enter public debates about the future and sustainability of nuclear energy production. This paper traces the early history of nuclear decommissioning debates and experiences, from the mid- 1970s to the early 1990s and shows how experts, regulators, and publics engaged in a debate riddled with many uncertainties: How could early experiences and evidence drawn from decommissioning small research reactors be applied to large commercial units in the future? Is decommissioning financially sustainable, environmentally safe, and technically feasible? Who should pay for it?

Davide Orsini is a Marie Skłodowska Curie Fellow at the Rachel Carson Center in Munich, where he is conducting a research project on the history and socio-ecological implications of nuclear decommissioning practices (MSCA-IF, NUCLEARDECOM: Half-lives/Afterlives: Labor, Technology, Nature, and the Nuclear Decommissioning Business-Grant Number 101023603-REA European Union). He is the author of *The Atomic Archipelago: US Nuclear Submarines and Technopolitics of Risk in Cold War Italy*. (University of Pittsburgh Press, 2022).

Voice “PRO” Technologies as a Driver, on the example of the Subcarpathia Region (Andrzej B. Podsadowski)

Confronted with social unrest in a poor region, in the 1930s the Polish Government decided to establish Central Industrial Area, turning cities such as Rzeszów and Mielec into aeronautical industrial centres (manufacturing of airframe and engines respectively). Since the 1970s, PZL Mielec and PZL Rzeszów developed their own R&D centres. The prosperity and development of the region were to a large extent built on the aeronautical sector till the end of the 1980s. The establishment and development of Rzeszów Technical University could be used as an example. After the turmoil caused by the end of the Cold War, the region's prosperity was restored, and its development was built upon the industrial base created in the previous system. The Special Economic Zone was created, as well as the Aviation Valley, with the support of AERONET, as a scientific and research basis for the industry. This allows us to address the environmental challenges associated with the project “Hydrogen Valley” lead by Rzeszów TU.

Andrzej B. Podsadowski graduated from Rzeszów Technical University as a mechanical engineer specialized in aviation/ aircraft structures, with the grade MSc. In 1980 he started work at the biggest Polish Aero defence company PZL Mielec. He worked there till March 2000 on different positions: Head of Unit (Aerodynamics and Strategic Marketing); Chief Designer (UAV VECTOR); Board Director; Representative of bankrupted company. In the period 2000-2004 he was Managing Director of GE Company Polska Engineering Design Centre. That company was cooperating with General Electric Aircraft Engines in order to successfully establish and develop the company. In 2004-2005 he was New Technology Officer of PZL Rzeszów (subsidiary of Pratt Whitney Canada). Since March 2005 to December 2021 worked as a project office in the Aeronautics Unit of the EU Commission Directorate-General Research and Innovation (Clean Sky, Clean Sky 2, Clean Aviation).

Deep Impact. Italian Scientific Participation in the Earth Observation for the Environmental Evolution (David Burigana)

With the launch of the PNRR National Reconstruction and Resilience Plan, the Italian government has entrusted the Italian Space Agency with the coordination of all space activities, focusing on satellite Earth observation among the main sectors where Italy has a significant position. Thanks to a new series of oral histories at the EU Historical Archives dedicated to Space Diplomacy, with the testimonies of Italian scientists over the last 40 years, it is possible to represent the impact of satellite technological evolution on the Italian scientific community. From San Marco in December 1964 directed by the Air Force, a synergy developed between research laboratories - divided between CNR (National Research Council) and some Universities (Turin, Milan, Padua, Bologna, Rome) - and companies united in CIA Compagnia Industriale Aerospaziale so much so as to bring the Italian- French dual use COSMO-SkyMed 1 and 2 (2007) and the Italian PRISMA (2019) to the radar satellites to monitor environmental evolution.

David Burigana is associate professor of history of international relations. He was work package leader of WP8 Space Diplomacy in “InsSciDE – Inventing a Shared Science Diplomacy for Europe” (Horizon2020-SC6-ENG-GLOBALLY-2017, Project ID 770523, 2017-22) and Head of Unit “Space Activities” of PRIN 2017 Science Technology and International Relations: Case Studies in Italian Foreign Policy (2020-25). Prof. Burigana is Coordinator of Curriculum 7 Law, Economy and Space Diplomacy in the National Doctorate in Space Science and Technology coordinated by the University of Trento National Doctorate Course in Space Science and Technology – SST, Member of the teaching body of the Doctorate in Sciences, Technologies and Measurements for Space – STMS, Member of the Board of Directors of CISAS – “Giuseppe Colombo” Center for Space Studies and Activities, Co-Director of the International School on Science Diplomacy, Ettore Majorana Foundation and Center for Scientific Culture, Eric and member of the Commission of History of International Relations. He is also currently Head of Unit “Space Activities” of PRIN 2022 Europe's Research for “Strategic Autonomy”: From the Late Cold War to the New Millennium (2022-25).

7.3 New Perspectives on Nuclear Culture

Location: GD 102

Coal in Interwar Europe: Between Nationalism and Transnationalism

Historical inquiry into how fossil-fuelled civilization came about and how fossil fuels have transformed human societies is becoming a key field of research across the humanities and social sciences. This session will contribute to pushing this research frontier by exploring the historical dynamics of coal in Interwar Europe. At focus is the tension between nationalism and transnationalism in European coal supply. At an aggregate level, coal became the most important fuel in Europe during the 19th century, due to high consumption in a few coal-rich countries. However, in the coal-poor countries and regions, which represented most of the continent, it was only around World War I that coal surpassed the traditional (organic) energy carriers. The Great War also exposed the complexities of cross-border coal relations. War-time coal shortages had a profound impact on war economies as well as on everyday life. Without coal, transport systems could not move food and commodities to cities and industries; factories came to a standstill and the civilian population could not cook available provisions. In the winter cities turned dark and cold as heating and lighting infrastructures were shut down. In this session we propose to take the traumatic war-time coal shortages as a point of departure for studying the period that followed – the Interwar era. From a statistical point of view, this period marks the peak of coal's dominance in the European energy system and it became the most vivid one in terms of European coal nationalism and transnationalism. We will explore how a diverse set of actors engaged in coal, against the backdrop of war-time memories, radical economic ups and downs, cartelization attempts, rapid technological change, geopolitical instability, dreams of autarky and visionary pan-Europeanism.

Organizers: Per Högselius, Marta Musso and Aliaksandr Piahnanau

Carbon Transnationalism: Cooperation and Conflict around Coal in Interwar Europe (Per Högselius, Marta Musso, Aliaksandr Piahnanau)

This paper explores a set of historical processes that we collectively refer to as “carbon transnationalism”. This notion serves to highlight that fossil fuels were extracted, processed and burnt in transnational exploitative systems, involving complex cross-border relations, and that fossil fuels, in the process, fundamentally changed the political, economic, social and cultural relations between and within countries. Our empirical focus is on coal. Taking the traumatic coal shortages in Europe during World War I as a point of departure, we zoom in on the period that followed – the Interwar era. This period marks the peak of coal's dominance in the European energy system and it became the most vivid in terms of European coal transnationalism. The paper approaches coal transnationalism from the perspective of the import-dependent nations, with a focus on three regions: Northern Europe (especially Sweden and Denmark), Central Europe (Austria and Hungary) and Southern Europe (Italy and France).

Per Högselius is professor of history of technology at KTH. He has published widely – in Swedish, English and German – on European and Swedish energy history. He is the author of *Red Gas: Russia and the Origins of European Energy Dependence* (2013), *Europe's Infrastructure Transition: Economy, War, Nature* (co-authored with Arne Kaijser and Erik van der Vleuten, 2016), and *Energy and Geopolitics* (2019).

Marta Musso is a researcher in energy history and digital history methods; she is currently a Be-For-ERC fellow at the University of Rome – La Sapienza and she was a post-doctoral researcher in energy history at KTH, and Max Weber Fellow at the European University Institute. She is the editor of the “Resources” section of the *Journal of Energy History* / *Revue d'histoire de l'énergie* (JEHRHE) and a member of Eogan, the network of energy archives.

Aliaksandr Piahnanau is a researcher at the Division of History of Science, Technology and Environment at KTH Royal Institute of Technology, Stockholm. He holds a PhD from the Toulouse University (2018), and is interested in history of energy, diplomacy and violence. His most recent book is *Big Powers in Middle Europe, 1918–45* (CEU Press, 2020), and his other studies appeared in *Diplomacy & Statecraft*; *Slavonic & Eastern European*

Review; Crime, History & Society; Hungarian Studies Review and Revue d'histoire slave.

World War I, Coal Shortages and the Birth of European Energy Governance in the 1919 Paris Peace Treaties (Aliaksandr Piahanaŭ)

World War I was, as Avner Offer argued, an energy war. The side that collectively harnessed more energy prevailed. This paper contends that the war accompanied the creation of the first European system of energy governance. First, amidst the war, Europe experienced its most dramatic energy shortages, which dwarfed the later oil shocks of the 1970s. Coal – the main energy carrier of the time – became dangerously scarce in the neutral, Entente and Central Powers. As coal supply bottomed out in 1919, the victorious Western powers designed a new scheme for exploiting and sharing coal from the defeated Central Powers. This system, institutionalized at the Versailles Peace Conference in a series of treaties and committees, was dismantled by the late 1920s. Nevertheless its promise inspired international actors, including the League of Nations, to plan a fairer system of “energy integration”, and, arguably led to the European Coal and Steel Community (ECSC) after World War II.

Aliaksandr Piahanaŭ is a researcher at the Division of History of Science, Technology and Environment at KTH Royal Institute of Technology, Stockholm. He holds a PhD from the Toulouse University (2018), and is interested in history of energy, diplomacy and violence. His most recent book is *Big Powers in Middle Europe, 1918–45* (CEU Press, 2020), and his other studies appeared in *Diplomacy & Statecraft; Slavonic & Eastern European Review; Crime, History & Society; Hungarian Studies Review and Revue d'histoire slave*. Email: piahanaŭ@kth.se

Adaptability, Diversification, and Energy Shocks: A Firm Level Productivity Analysis (Sofia Teives Henriques)

Energy economists have long argued that energy systems need to be adaptable in the face of shocks. In the early twentieth century, Denmark embodied the opposite, with its industry almost entirely dependent on

imports of coal from the UK. Towards the end of the First World War, however, and well into the 1920s, coal imports were cut off or difficult to obtain. Local diversification was possible, however, through peat. We exploit detailed microlevel data from butter factories, covering the period 1900-28. Employing an event study approach, we find significant productivity advantages for firms closer to available peat fields in the wake of the coal shortage, and that these gains persisted even when peat was no longer used. Our results thus suggest that public policy might aim to support adaptability for firms less able to transition to more sustainable energy if that is the price of longer-term efficiency and survival.

Sofia Teives Henriques is Assistant Professor at the University of Porto, Faculty of Economics. She holds a PhD in economic history from Lund University, and she was a postdoctoral research at the Department of Business Economics at the University of Southern Denmark (2012-2014) and Lund University (2015-2020). She was also visiting scholar at the University of Cambridge (2016), Rachel Carson Center in Munich (2017), and University Paris Diderot (2018).

The “Coal Line” and the Invention of National Fuel in Early Republican Turkey (Onur İnal)

On November 19, 1936, a grand celebration was held at the Ankara Railway Station, welcoming the first train loaded with coal from the mining town of Filyos on the Black Sea coast to the capital of the young Turkish Republic. An extension to Zonguldak, an important city along the “coal coast,” was completed a year later. The inauguration of the Ankara-Filyos-Zonguldak line was an essential component of infrastructural development that aimed to create a landscape of energy flows between the mining regions of Anatolia and the capital city. This paper will examine the development of the “coal line” to provide new insights into how technology, as a powerful agent, reshaped the socio-ecological landscapes in early Republican Turkey. The papers shows how the line helped the Kemalist government promote the production and sale of coal as Turkey’s national fuel and initiate the transition to a fossil fuel economy. It also discusses how anthracite coal

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transported through the coal line served to construct national identity and cultivate modernity in early Republican Turkey.

Onur İnal is a postdoctoral researcher at the University of Vienna. His research interests center on environmental history, history of technology, and human-animal encounters, with a regional focus on Turkey and the Middle East. He co-edited *Seeds of Power: Explorations in Ottoman Environmental History* (White Horse Press, 2019) and *Transforming Socio-Natures in Turkey: Landscapes, State and Environmental Movements* (Routledge, 2019). He is the founder of the Network for the Study of Environmental History of Turkey (NEHT).

Polish Coal Exports in the Interwar Period: Between State Intervention and Foreign Capital (Jerzy Łazor)

The paper will chart the process of how interwar Poland became one of the principal European coal exporters. This change saw coal producers, which before the war had catered to domestic, imperial markets, reorient their sales to buyers from outside of Central and Eastern Europe, forcing competition with, among others, British coal. Based on an analysis of export markets and prices, government intervention, and the sector's internal organization, it will attribute this changing geography of Poland's coal sales to the interplay of state policy, informed by balance of payments considerations, with the actions of mostly foreign-controlled coal producers. It will also show how these factors were influenced by geopolitics: the political conflict and trade war with Germany, as well as the Polish alliance to France. The paper will be based on archival and statistical sources.

Jerzy Łazor, PhD, is an Assistant Professor at the Warsaw School of Economics, Poland, and a former research fellow at the Imre Kertész Kolleg in Jena, Germany. He writes on twentieth-century economic and business history in Central and Eastern Europe, concentrating on capital flows and centre-periphery relations. After finishing a book on interwar French investment in Poland and economic nationalism, he is starting a new project on Polish joint-stock companies.

15:30-16:00

Coffee break

Location: GD Aula

16:00-16:45

Keynote: Writing Transformative Envirotech History in the Anthropocene: Provocations and Opportunities (Helmut Trischler)

Location: Logensaal (LH)

16:45-17:00

Closing remarks

Location: Logensaal (LH)

18:30-24:00

Conference dinner

Location: GD Mensa