



53RD ICOHTEC ANNUAL MEETING

ALEXANDROUPOLIS, GREECE | 8-11 OCTOBER 2026

BOOK OF ABSTRACTS

Engaging the History of Technology. Bridging
Disciplines and Perspectives for Global Challenges

ORGANIZERS



Laboratory of
Technology,
Research &
Applications in
Education



MEDICAL SCHOOL
DEMOCRITUS UNIVERSITY OF THRACE

SPONSORS



PRESIDENT'S GREETING

Welcome / Καλωσήρθατε

It is my great pleasure to welcome all participants to the 53rd Annual Meeting of ICOHTEC, hosted by our institution, the Democritus University of Thrace.

The theme “Engaging the History of Technology: Bridging Disciplines and Perspectives for Global Challenges” is especially meaningful in a region such as Thrace. For thousands of years, Thrace has been a crossroads of peoples and communities. Despite imperial conflicts, population movements, and nationalist divisions, it has preserved a rich multicultural mosaic. In antiquity, Thrace occupied a distinctive place in the Greek imagination—as a region where the rational traditions of the Greek city-states encountered the cultures of the north. Many important myths, including those of Dionysus and Orpheus, gods and heroes of wine, joy, fertility, theater, music and poetry originated in Thrace. Over the centuries, Thrace was successively conquered by major powers, including the Athenians, Persians, Macedonians, and Romans. The Byzantine and Ottoman civilizations left a particularly profound mark on the region. Thrace became, in many respects, the European hinterland of Constantinople: a bridge between East and West, North and South. Innumerable migration flows have left their fingerprint in Thrace and setting it a meeting place and a melting pot of cultures, religions, ideas, and technologies.

This history makes Thrace an especially appropriate setting for our conference. The region reminds us that technological development has always taken place through contact, movement, exchange, adaptation, and sometimes conflict. Technologies do not exist apart from societies; they travel across borders, are reshaped by different communities, and eternally acquire new meanings in different cultural contexts.

At a time of major global challenges—including climate change, sustainability, digital transformation, inequalities, and the ethical questions surrounding emerging technologies—the history of technology has an essential contribution to make. By studying past choices, achievements, failures, and unintended consequences, we can develop a more critical understanding of the technological developments we are facing today.

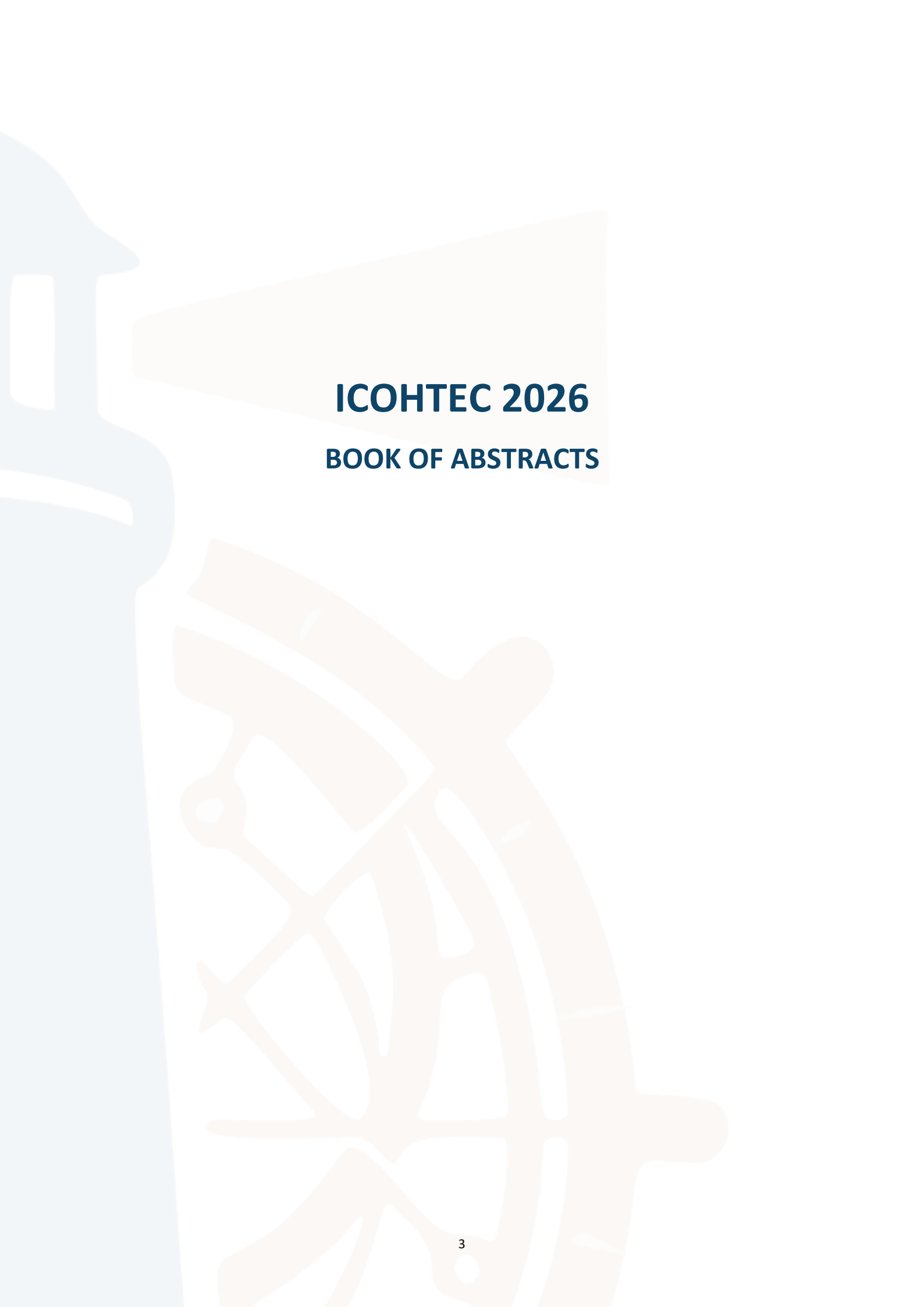
This conference offers an opportunity to cross disciplinary boundaries and bring diverse perspectives into dialogue. We hope that it will generate stimulating discussions, encourage new collaborations, and demonstrate how historical knowledge can contribute to contemporary debates.

I would like to express my sincere gratitude to ICOHTEC, the scientific and organizing committees; and to our institutional partners, the Ethnological Museum of Thrace and the Medical School of Democritus University. I also warmly thank all scholars and researchers for joining this conference and for sharing their knowledge and experience with us.

Prof. Angelos Palikidis

Democritus University of Thrace

President of the Local Organizing Committee



ICOHTEC 2026

BOOK OF ABSTRACTS

TABLE OF CONTENTS

HISTORY OF TECHNOLOGY, HISTORIOGRAPHY AND EDUCATION.....	12
‘THERE IS A RISK OF NEGLECT’ – DECISIONS IN YOUTH WELFARE OFFICES BETWEEN STREAMLINING, RATIONALISATION AND DIGITISATION (1950–2026)	13
A CASE STUDY FOR THE KNOWLEDGE MOVEMENT: DORIN PAVEL AS ZURICH POLYTECHNIC STUDENT AND FOUNDER OF ROMANIAN HYDROELECTRICITY	14
BETWEEN SCIENCE AND TECHNOLOGY DIPLOMACY: EUROPEAN COOPERATION IN NUCLEAR FUSION RESEARCH, 1950S–EARLY 2000S	15
INSAID: USING THE HISTORY OF TECHNOLOGY IN EDUCATION	16
RECONFIGURING SOCIOTECHNICAL INEQUALITY: INTERSECTIONALITY AND YOUNG WOMEN’S STEM EDUCATION IN SOUTHERN BRAZIL	17
SINO-POLISH TECHNOLOGICAL EXCHANGE IN 1959: PRECAST CONCRETE SHELL STRUCTURES AT JIANGMEN SUGAR PLANT, GUANGDONG AND HALA SPORTOWA, STALOWA WOLA	18
TECHNOCRACY IN SOCIALIST YUGOSLAVIA: EXPERTISE, POWER, AND THE LIMITS OF MODERNIZATION	19
THE DIVERGENT ERA OF AUDIO TECHNOLOGICAL INNOVATIONS 1775 – 1914	20
THE HISTORY OF SCIENTOMETRICS: FROM BIBLIOGRAPHY TO INNOVATION POLICY	21
THE RELATIONSHIP BETWEEN THE AUTOMOTIVE ELECTRICAL EQUIPMENT INDUSTRY AND TECHNICAL UNIVERSITIES IN ROMANIA. TRANSILVANIA UNIVERSITY OF BRASOV AND ELECTROPRECIZIA SĂCELE BRAȘOV - CASE STUDY	22
INTERSECTIONS BETWEEN THE HISTORY OF TECHNOLOGY AND OTHER FIELDS OF HISTORICAL STUDY	23
"UNITY FROM DIVERSITY, CENTRALIZATION IN THE FACE OF PLURALISM": 19TH-CENTURY FORESTS AS ENVIROTECHNICAL SYSTEMS	24
“CONTROLLING COMFORT: THE SPREAD OF AIR CONDITIONING IN THE MID-20TH CENTURY UNITED STATES”	25
A RETURN TO FORGOTTEN EVERYDAY TECHNOLOGIES AS A REGIONAL DEVELOPMENT STRATEGY	26
AGREEING ON THE PAST: THE HISTORY OF TECHNOLOGY IN COASTAL REAL-WORLD LABORATORIES	27
BRAIN GAIN: ON ATTRACTING STEM MIGRANTS	28
DATA IS THE NEW OIL: A POLITICAL COMPARISON BETWEEN THE EUROPEAN COMPUTING INDUSTRY AND THE EUROPEAN OIL INDUSTRY	29
DATA STRUCTURES OF EXTINCTION: AUTHORITY AND THE MAKING OF GLOBAL CONSERVATION	30
DISPOSABLE PLASTIC SYRINGES AND THE DAILY WORK OF GRASSROOTS MEDICAL WORKERS: A STUDY BASED ON THE EXPERIENCE OF RURAL DOCTORS IN CHINA	31
ENVISIONING A GREEN FUTURE: RETHINKING INDUSTRIAL PROGRESS IN THE UKRAINIAN COAL INDUSTRY	32

FLORA AND THE IMPERIAL MACHINE: PLANT LISTS AS TECHNOLOGIES OF ECOLOGICAL CONSTRUCTION	33
FROM CALCULATION TO COMPUTATION: ALGORITHMS, CALCULI, AND THE TRANSFORMATION OF SCIENTIFIC KNOWLEDGE IN THE TWENTIETH CENTURY	34
FROM CANNONS TO STEAM ENGINES: THERMODYNAMICS, POWER, AND THE SOCIAL REORGANIZATION OF TECHNOLOGY	35
HYDROELECTRIC LANDSCAPES: RETHINKING SUSTAINABILITY THROUGH THE HISTORY OF ENERGY INFRASTRUCTURES	36
IMPLANON: AN INTERREGIONAL HISTORY OF CONTRACEPTIVES AND MOBILE CLINICS IN ETHIOPIA AND SOUTH KOREA	37
INFRASTRUCTURAL MEMORY: A MNEMOTECHNICAL HISTORY OF STARI MOST AND BURNTOLLET BRIDGE	38
LISBON ELECTRIC TRAMWAYS AS SEEN THROUGH THE LENSES OF PHOTOGRAPHERS FROM THE LISBON TRAMWAY COMPANY	39
LISTENING TO THE “MURMUR OF THE THOUSAND VOICES OF SACRIFICE”: DAM-INDUCED DISPLACEMENT AND THE BUILDING OF PORTUGAL’S ELECTRICAL POWER SYSTEM DURING THE FASCIST NEW STATE REGIME (1933-1974)	40
MAPPING PRODUCERS UNDER ENERGY CONSTRAINT: BUILDING MATERIALS IN PALESTINE/ISRAEL, 1922-1967	41
PRECISION AS POWER: HIGH-TECHNOLOGY MEASUREMENT AND THE MAKING OF INTERNATIONAL STANDARDS (1930–1960)	42
STONES UNDERFOOT: A HISTORY OF PAVING TECHNOLOGIES AND THE MAKING OF URBAN EXPERIENCE	43
TECHNOLOGIZING THE IRRIGATION AND AGRARIANIZING OF THE THAR DESERT	44
TECHNOLOGY AND WEAPONRY IN THE BALKAN WARS (1912-13)	45
TECHNOLOGY, STATE POWER AND BORDER GOVERNANCE	46
THE HISTORICAL ALLIANCE OF TECHNOLOGY AND POWER: TECHNOLOGIES OF POWER, SOCIAL EPISTEMOLOGY	47
THE OLIVE PRODUCTION IN THE MEDITERRANEAN REGION, FROM 1940S TO 1970S	48
THE PRODUCTION OF SCIENTIFIC KNOWLEDGE AMID VIOLENCE: THE CASES OF FREDERICO WELWITSCH’S EXPEDITIONS IN PORTUGAL AND ANGOLA	49
THE RECONSTRUCTION OF ASTRONOMICAL KNOWLEDGE AND INSTITUTION IN EARLY SONG DYNASTY	50
TOY ROBOTS: PLAYING WITH TECHNOSCIENCE	51
TRANSMISSION OF ARTISANAL KNOWLEDGE BETWEEN MINING COMMUNITIES: BETWEEN TRADITION AND PROFESSION.	52
UNDERSTANDING TECHNOLOGY INNOVATION: MECHANIZATION AND ENVIRONMENTAL IMPACTS	53

WHO DEFINES THE “REVOLUTION”? SOCIAL CONSTRUCTION, PERIODIZATION, AND CONTEMPORARY TECHNOLOGICAL HIERARCHIES	54
SPECIAL FOCUS: MUSEUMS, MATERIAL AND INTANGIBLE CULTURAL HERITAGE, AND PUBLIC ENGAGEMENT	55
A CENTURY OF HISTORY OF PRINTING TECHNOLOGY IN GREECE THROUGH THE ARCHIVE AND COLLECTIONS OF THE ASPIOTIS-ELKA GRAPHIC ARTS SA, HELD BY THE HISTORICAL ARCHIVE OF THE NATIONAL BANK OF GREECE.	56
COLLECTING FOR COMPARATIVE TECHNOLOGY. THE JANKOVIC COLLECTION OF ETHNOGRAPHIC OBJECTS AT THE MUSÉE DE L'HOMME	57
CREEPING INTO THE CONTEMPORARY: MATERIAL SOURCES, PLACES AND EXHIBITIONS OF SALT HISTORY IN NUCLEAR REPOSITORY SITING	58
FROM NATION BUILDING TO CAMPUS SPIRIT: THE ROLE OF POLYTECHNIC MUSEUM AND MUSEUM OF STUDENT LIFE IN ENGAGING TECHNOLOGY STUDENTS TO HISTORY OF PROFESSION AND CULTURAL HERITAGE FROM 1958 TO 2021	59
GENDER AS AN ANALYTICAL TOOL FOR TECHNICAL COLLECTIONS. RETHINKING MATERIAL CULTURE IN THE HISTORY OF TECHNOLOGY	60
HERITAGE PROTECTION OF A RAILWAY-ASSOCIATED TECHNOLOGY: AN ANALYSIS OF THE CASE OF THE PARANAPIACABA FUNICULAR SYSTEM (BRAZIL)	61
HISTORY THROUGH EXPLORATION: PERIPHERY PASSIVE ENGAGEMENT IN HISTORICAL VIDEO GAMES	62
PRESERVING THE UNPRESERVABLE: A FRAMEWORK FOR LARGE SCALE ARCHIVAL CONSERVATION OF TECHNICAL CONSTRUCTIONS	63
SCIENCE MUSEUMS AND THE SCIENTIFIC IDENTITY OF SHANGHAI	64
THE "PASTALI" FARMHOUSE IN XANTHI: FROM HISTORICAL TOBACCO CULTIVATION TO A HYBRID MODEL OF ADAPTIVE REUSE	65
THE HISTORY OF TECHNOLOGY BETWEEN THE LOCAL, THE REGIONAL, AND THE GLOBAL	66
ASSEMBLY LINES & SKDS IN LOCAL SETTINGS: EXPORTING ROMANIAN TRACTORS DURING IN 1970S ..	67
CRAFTING LIGHT: A HISTORICAL PERSPECTIVE ON REFLECTING TELESCOPES IN THE SPECULUM ERA	68
EARTH STATIONS FOR SALE: SATELLITES AND THE POSTCOLONIAL ORDER OF LONG-DISTANCE TELECOMMUNICATIONS	69
FROM CYBERNETICS TO CYBER-PHYSICAL PRODUCTION: A CRITICAL GENEALOGY OF THE DIGITAL TWIN AND ITS EPISTEMIC POLITICS IN MANUFACTURING	70
FROM SANDLOTS TO SMART PLAYGROUNDS: A TECHNOLOGICAL HISTORY OF URBAN PLAY SPACES	71
FROM SILVER NITRATE TO NEURAL NETWORKS: VISUAL ARCHIVES AND THE TRANSFORMATION OF MEDICAL DIAGNOSIS	72
HEIMDAL - THE AIRPORT THAT NEVER WAS	73
HERO ALEXANDRINUS PNEUMATICA: TWODEVICES AND THEIR CONTEXTS THROUGH THE AGES	74

HOW TO MANAGE THE GULF STREAM? FROM DISCUSSING ITS CHARACTERISTICS TOWARD VISIONS FOR HARNESSING THE ATLANTIC OCEAN CURRENT	75
ICEBREAKER – A HISTORY OF TECHNOLOGY CHANGING GEOGRAPHY	76
INFRASTRUCTURING IMAGINARIES OF PRODUCTIVISM: TECHNOSCIENCES AND TRANSFORMATIONS IN THE INDUSTRIALIZATION OF ANIMAL HUSBANDRY IN GREECE, 1950-2025	77
INNOVATION WITHOUT EQUITY: RACE AND MEDICAL TECHNOLOGY	78
THE UNEVEN PROMISE OF MEDICAL INNOVATION: RACE, TECHNOLOGY, AND HEALTH DISPARITIES	79
INSTRUMENTS, IMAGES, AND THE HEAVENS: NON-OFFICIAL ASTRONOMICAL PRACTICES AND LITERATI KNOWLEDGE-MAKING IN QING CHINA	80
INTERNATIONAL INNOVATION OF CONSTRUCTION: DYWIDAG, FRANKE AND B.R.C., THREE FUNDAMENTAL CONSTRUCTION COMPANIES IN EARLY 20TH CENTURY IN CHILE	81
ISLANDS AS LABORATORIES: LOCALISING GLOBAL ENERGY TECHNOLOGIES IN THE AEGEAN	82
LIVING TECHNOLOGIES AND COLD WAR DEVELOPMENT: AFRICANIZED BEES IN LATIN AMERICA.....	83
MAKING 'NEW SCIENCE' PUBLIC: PRINT, LANGUAGE, AND CURRICULUM IN THE OTTOMAN EMPIRE ...	84
MYTHS, MYTHOLOGIES, AND MISSILES	85
NMM6: MARINER'S ASTROLABES, NAUTICAL MANUALS, AND IMPERIAL SCIENCE IN THE EARLY MODERN IBERIAN WORLD	86
PEOPLE BEHIND THE SCENES: THE OTTOMAN INSPECTION COMMISSION AND THE TECHNOPOLITICS OF INTERCHANGEABLE MANUFACTURE.....	87
PIONEER WIRELESS TELEGRAPHY THROUGH THE CHACAO CHANNEL. CHILE 1898	88
REDESIGN OR OPTIMIZATION? TWO TRAJECTORIES OF TECHNICAL ASSISTANCE IN SOCIALIST VIETNAM'S STEELMAKING	89
RISK IN A GLOBAL AGE: FIRE EXHIBITIONS AND TECHNOLOGICAL EXCHANGE IN THE NORTH ATLANTIC AND COLONIAL WORLD, 1901-1904.....	90
SCIENTIFIC MISSIONS AND THE CIRCULATION OF KNOWLEDGE: PROFESSORS, MOBILITY, AND APPLIED SCIENCE BETWEEN UNIVERSITY AND STATE (1790–1815).....	91
SUSTAINABILITY, WELL-BEING AND A GREEK CONNECTION: THE CASE OF THE ALUMINIUM INDUSTRY IN DELFT, IN THE NORTHERN NETHERLANDS.....	92
TECHNOLOGICAL MOMENTUM UNDER GEOPOLITICAL INVERSION: JINR'S BROKERAGE AFTER 1991 AND AFTER 2022	93
THE DIALOGIC CONSTRUCTION OF TECHNOSCIENTIFIC IMAGINARIES: BETWEEN FOUNDING NARRATIVES AND BUILDING COMMUNITY.....	94
THE EVOLUTION OF MASS MEASUREMENT METHODOLOGY AND TECHNIQUES AT THE ROMANIAN NATIONAL INSTITUTE OF METROLOGY DURING THE PERIOD 1889–2018	95
THE FAEROP FESTIVAL MODEL: INDUSTRIAL HERITAGE AS A LIVING ECOSYSTEM FOR SUSTAINABLE REGIONAL DEVELOPMENT	96
THE JOURNEY OF THE BASSET METHOD: METALLURGY, CEMENT-MAKING AND TECHNOPOLITICS ACROSS BORDERS (1930-1945)	97

THERE ARE SO MANY ANECDOTES: HOW MODEMS WRITE A MULTISCALE INTERNET HISTORY	98
TRAJECTORIES OF ATOMIC CLOCKS : ENGLAND, CANADA AND SWITZERLAND	99
UNUSUAL REPAIR PRACTICES OF TELEPHONE TECHNICIANS	100
URBAN ENERGY SUPPLY IN BUDAPEST IN PEACE AND WAR, 1890–1940.	101
ROUNDTABLES.....	102
ORAL HISTORY BEYOND INTERVIEWS: PROMISES AND PITFALLS	103
HISPANOAMÉRICA EN LA HISTORIA GLOBAL DE LA TECNOLOGÍA: CONEXIONES, PERSPECTIVAS Y DESAFÍOS EN EL SIGLO XXI	104
LATIN AMERICA IN THE GLOBAL HISTORY OF TECHNOLOGY: CONNECTIONS, PERSPECTIVES, AND CHALLENGES IN THE 21ST CENTURY	105
PANELS	106
MULTIDIMENSIONAL PRESENTATION OF MEDICAL HISTORY OF TECHNOLOGY: THE ROLE OF MUSEUMS IN PRESERVATION, COMMUNICATION, AND CROSS-CULTURAL DIALOGUE.....	107
GLOBAL VISION AND LOCAL PRACTICE: A COMPARATIVE STUDY OF UROLOGICAL INSTRUMENT MUSEUMS IN THE WEST AND CHINA.....	108
IMMERSIVE COMMUNICATION OF TRADITIONAL CHINESE MEDICINE CULTURE: TECHNOLOGICAL EMPOWERMENT AND PUBLIC PARTICIPATION AT BEIJING UNIVERSITY OF CHINESE MEDICINE EXPERIENCE PAVILION	109
EXHIBITING ANCIENT GREEK SCIENCE IN THE MUSEUM: NEW TECHNOLOGIES FOR HISTORICAL RECONSTRUCTION	110
A NEW WAY OF MAKING: HISTORICAL MODEL MAKING AND THE USE OF 3D PRINTING AT THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY (OUMNH).....	111
ENERGY, TECHNOLOGY, AND THE ENVIRONMENT: CONFLICT OR COMPATIBILITY	112
SCIENCE-ENGINEERING OF WATER PURIFICATION FROM ANCIENT TIMES TO PRESENT	113
TECH INNOVATION AND MULTIDISCIPLINARITY FOR ENERGY-ENVIRONMENT NEXUS IMPROVEMENT.....	114
SWEDEN’S FORESTS - A SUSTAINABLE STORY?	115
FUELING THE CAPITAL: A TRANSNATIONAL ENERGY HISTORY OF STOCKHOLM.....	116
WHOSE SIGNAL, WHOSE STORY? DECOLONIALITY AND THE CURATION OF TECHNOLOGICAL COMMUNICATION HISTORIES	117
CONNECTED HISTORIES, THE TELEGRAPH IN NIGERIA	118
COLD HISTORIES OF HOT WARS: RESEARCHING COOLING TECHNOLOGIES AND US POWER IN THE TWENTIETH CENTURY	119
COLONIAL DISCOMFORT AND THE CORPORATE ARCHIVE: CURATING INDIA ON THE LINE AT THE BT ARCHIVES	120
SATELLITE TELEVISION AND THE PROJECT TO CREATE A ‘SCIENTIFIC TEMPER’ IN POST-COLONIAL INDIA 	121

"THE HISTORY OF THE METALLURGIC ARTS IS INVOLVED IN THE HISTORY OF THE CIVILISATION OF MAN": METALLURGICAL TECHNOLOGIES AND COLONIAL ANTHROPOLOGY IN THE NINETEENTH CENTURY	122
RITUALIZING MOBILITY: TRANSPORT INFRASTRUCTURE, INAUGURATION CEREMONIES, AND THE POLITICS OF MEMORY	123
RITUALIZING THE MOTORWAY: INAUGURATION CEREMONIES AND THE CHANGING MEANING OF ROAD INFRASTRUCTURE IN CZECHOSLOVAKIA, 1930S–1980S	124
THE INAGURATION CEREMONIES OF HIGHWAYS IN SOCIALIST BULGARIA AND YUGOSLAVIA.	125
BLESS THE GAS! VÍTKOVICE IRONWORKS AS A PIONEER IN THE GASIFICATION OF AUTOMOTIVE TRANSPORT (UNTIL 1945)	126
DRIVING GROWTH AND DEVELOPING ROADS: TRANSPORT ECONOMICS AND THE GLOBAL CIRCULATION OF AUTOMOTIVE INFRASTRUCTURE IDEAS, 1950-1970	127
JIM CROW AT HOME AND NEO-COLONIALISM OVERSEAS: THE "UNFORGIVABLE BLACKNESS" OF AFRICAN AMERICAN COMMERCIAL PILOTS, 1945-1964	128
TECHNOLOGY, EVERYDAY LIFE, AND PRIVATE INITIATIVE IN THE LATE SOVIET UNION	129
BIKE AND WORK IN UKRAINIAN VILLAGES DURING THE LATE SOVIET PERIOD	130
NORMALIZING PRIVATE LIFE: VERNACULAR PHOTOGRAPHY IN SOVIET UKRAINE	131
LIVING COMFORT LIFE. HOUSEHOLD APPLIANCES AND THEIR IMPACT ON SHAPING INDIVIDUALISM IN LATE SOCIALISM.....	132
ESTONIAN SHALE OIL TECHNOLOGIES AND THE BIRTH OF SHALE OIL INDUSTRY IN THE SOVIET UNION	133
SPECIAL SESSION ON BART HACKER AND THE SOCIAL HISTORY OF MILITARY TECHNOLOGY.....	134
BART HACKER AND THE SOCIAL HISTORY OF MILITARY TECHNOLOGY: CASE STUDY COMPARISON OF THE PRE-1914 PERIOD, THE INTERWAR (1919-1939) AND THE UKRAINE-RUSSIAN WAR	135
ETHICS AND COMBAT DRONES TECHNOLOGICAL MOMENTUM	136
OTTOMAN GUNS AND THE FALL OF THE BYZANTINE EMPIRE	137
ALL HAIL TO THE WEAPONS: THE ARMS RACE AND THE MILITARY ADVANCEMENT IN THE STRUGGLE OF CENTRAL EUROPEAN HEGEMONY	138
TECHNOLOGIES IN TENSION WITH THE NATION-STATE: ENGINEERING AS A MEANS OF REGIONAL AUTONOMY AND SUPRANATIONAL INTEGRATION	139
SEMICONDUCTOR MANUFACTURING AND THE (DE)CONSTRUCTION OF SOVEREIGNTY	140
TIDAL POWER CHALLENGING NATIONAL ELECTRICITY INTEGRATION, BRITANNY, 1945-1985.....	141
DISCUSSING THE MATERIAL IMPACT OF A FUSION FUTURE: PERFORMATIVE QUALITIES OF COUNTERARGUMENTS DURING THE 1970S AND 1980S NUCLEAR FUSION HYPE CYCLE	142
IDENTIFYING THE SOCIAL BACKGROUNDS OF ENGINEERING STUDENTS IN THE LATE OTTOMAN EMPIRE: THE CASE OF HIGHER SCHOOL OF CIVIL ENGINEERING (MÜHENDİS MEKTEB-I ÂLÎSİ)	143
THE COLD WAR AND THE COMPUTERIZATION OF SCIENTIFIC DISCIPLINES	144
NETWORKING EARLY COMPUTING HISTORIANS IN THE COLD WAR PERIOD	145

FLOODS AND COMPUTERS: THE INTERNATIONALIZATION AND COMPUTERIZATION OF HYDRAULICS IN GLOBAL COLD WAR HUNGARY (1950S-1980S)	146
FROM ADAM AND EVA TO THE WORLD WIDE WEB: A BRIEF INTERNATIONAL HISTORY OF DATA SHARING IN PHYSICS	147
COMPUTATION AND THE CONSTRUCTION OF TARGETS – A DUAL-USE SCENARIO	148
DESIGNING CURRICULAR INFRASTRUCTURE IN THE HISTORY OF TECHNOLOGY FOR TWENTY-FIRST-CENTURY CHALLENGES	149
DESIGNING CURRICULAR INFRASTRUCTURE IN THE HISTORY OF TECHNOLOGY FOR TWENTY-FIRST CENTURY CHALLENGES	150
THE ENGINEER IN THE WORLD: TEACHING ENGINEERS THE HISTORY OF THEIR PROFESSION	151
HISTORY OF TECHNOLOGY AND MIDDLE SCHOOL MATHEMATICS CURRICULUM: IN THE INDIAN CONTEXT	152
HISTORICAL IMAGINATION AND ARTIFICIAL INTELLIGENCE: PEDAGOGICAL TRANSFORMATIONS IN HISTORY TEACHING	153
INTANGIBLE ASSETS FOR THE STUDY OF TANGIBLE THINGS: DOCUMENTING, LINKING, AND INTERPRETING CANADA'S DESIGN HERITAGE	154
MAKING, UNMAKING, AND REMAKING RESEARCH COLLECTIONS FOR THE STUDY OF CANADIAN DESIGN AND TECHNOLOGY	155
FROM ENVISIONED USERS TO MATERIAL PRACTICE: THE NORTHERN TELECOM DISPLAYPHONE IN CONTEXT	156
DESIGNING CORPORATE COOL IN THE 1960S: AN XDX CASE STUDY OF CLAIRTONE'S PROJECT G STEREO	157
THE SUN FROM THE SOUTH: IMAGINARIES AND REALITIES OF CHILEAN ENERGY DEVELOPMENT (1976-2025) (FONDECYT PROJECT 1250560)	158
BUILDING SOLAR STATES: CHILE AS A HUB FOR ENERGY IMAGINARIES (1976-2020)	159
PLANNING THE SUN: SOLAR ENERGY, TECHNOCRATIC EXPERTISE, AND STATE STRATEGY IN CHILE'S MILITARY DICTATORSHIP	160
THE PLACE OF THE SUN IN CHILE'S NATIONAL ENERGY BALANCE	161
LEARNING FROM THE SUN IN THE RURAL SCHOOL: A PEDAGOGICAL EXPERIENCE FOR LEARNING THE HISTORY OF SOLAR ENERGY IN MAULE, CHILE	162
PLASTIC ENVIRONMENTS	163
BRAVE NEW WORLD? THE SUBJECT "PLASTIC" IN POPULAR MAGAZINES AND NEWSPAPERS, 1950S–2000S	164
PLASTIC, CRAFTSMANSHIP AND AIR – A VIENNESE STORY OF INFLATABLE ARCHITECTURE	165
THE ARTEFACT AS AN HISTORICAL SOURCE – CULTURAL AND MATERIAL ANALYSIS OF PLASTIC OBJECTS FROM FORMER CONCENTRATION CAMPS	166
WESTERN BALKAN "PLASTICENE": AN OVERVIEW OF THE EXTENSIVE USE OF PLASTIC PRODUCTS IN THE POST-SOCIALIST WESTERN BALKANS AND ITS ENVIRONMENTAL IMPACT	167

PLASTICS THAT SHAPED A TERRITORY: THE PRODUCTION OF CELLULOSE ACETATE AND NITRATE FOR THE EYEWEAR INDUSTRY IN THE CADORE REGION AND THE MUSEALISATION OF MADE IN ITALY ICONS	
.....	168
THE INTRODUCTION AND WIDE APPLICATION OF PLASTICS IN MEDICINE: PROBLEMS SOLVED AND NEW ISSUES ARISEN	
.....	169
WEARING PLASTIC: THE METABOLISM OF SYNTHETIC AND ARTIFICIAL TEXTILES IN THE 20TH CENTURY	
.....	170
AUTHORS INDEX	171

HISTORY OF TECHNOLOGY, HISTORIOGRAPHY AND EDUCATION

‘THERE IS A RISK OF NEGLECT’ – DECISIONS IN YOUTH WELFARE OFFICES BETWEEN STREAMLINING, RATIONALISATION AND DIGITISATION (1950–2026)

Claudia Streblow-Poser

University of Applied Science Dortmund

claudia.streblow@fh-dortmund.de

Youth welfare offices have (among other things) the task of supporting the healthy development of young people and protecting the welfare of children and young people. This involves deciding how children and their families can be helped and whether or not the welfare of the child is at risk. The talk will analyse the changing approaches in post-war Western Germany, based on exemplary files (written by hand or typewriter) and currently used software programs. Special focus is on the question, how new technologies form the process of documentation.

In an ongoing research project (Youth Welfare Office Decisions Through Time, e.g. Streblow-Poser 2020, 2024), files from six metropolitan areas in Germany (1950s to 2020s) were selected and interpreted using qualitative methods. The written practice of justifying decisions about whether to provide assistance or not has changed significantly since the post-war period: Not only changes in training and new laws, but also social changes, such as increasing economisation and technification of society, can be found in the documents. How professionals deal with increasing rationalisation efforts and changing technology is examined from both, a sociological and historical perspective. A critical analysis shows how difficult it has been over the decades to classify and make decisions in highly stressful family situations. There are currently projects in which artificial intelligence is already being used as a co-decision-maker.

This highlights how professional standards in social work are being challenged by technology in order to translate the ambiguities of complex problems into clear-cut solutions. The talk will draw a connection between detailed observations recorded by social workers and new developments in the use of software in youth welfare offices in order to relate current developments to their historical context.

Streblow-Poser, Claudia (2020): Jugendamtliche Entscheidungsprozesse vor und nach den Heimkampagnen der 1970er Jahre, in: Biebricher, M./Businger, S. (ed.): Von der paternalistischen Fürsorge zu Partizipation und Agency. Zürich. pp. 133-155.

Streblow-Poser, Claudia (2024): Digitale Formulare der Kinder- und Jugendhilfe. Praxeologische Annäherungen an Organisationssymboliken, in: Hoffmann, S., Hunold, M., a.o. (ed.). Jahrbuch Dokumentarische Methode, H.7/2024, Berlin, pp. 177-196. <https://doi.org/10.21241/ssoar.108308>

Keywords: Youth Welfare, historiography of documentation, digitalisation

A CASE STUDY FOR THE KNOWLEDGE MOVEMENT: DORIN PAVEL AS ZURICH POLYTECHNIC STUDENT AND FOUNDER OF ROMANIAN HYDROELECTRICITY

Elena Helerea¹, Costela Beatrice Ghiță²

¹ *Transilvania University of Brasov*

² *Remus Răduleț Energy Technical College of Brașov*

helerea@unitbv.ro

The movement of skilled labour, experts, and knowledge across borders is a topic that dominated the late 19th and early 20th centuries. As globalization took hold, this phenomenon intensified. The movement of people facilitated the communication of knowledge and the development of new knowledge systems. State institutions, recognizing the link between the movement of people and knowledge, developed creative ways to encourage industry and promote economic interests, through trade and by stimulating and controlling the movement of people.

Thus, renowned universities in Western European countries where technologies were taking off became increasingly attractive. What is certain is that this movement of people who were sent to study in European universities led to the movement of technologies but also of ideas, cultural expressions, norms and all the factors involved.

This paper proposes a case study – to follow the effect of the education abroad of the young Dorin Pavel who was one of the 50 Romanian students subsidized by the Romanian state for education abroad in a university in Western Europe.

Dorin Pavel, born in 1900, came from a family of teachers from the Transilvanian region, who had studied the first grades at the Saxon General School in Sebeș, then at the Kun Hungarian College in Orăștie, then, as a student at the Theological Seminary in Sibiu. After defending his baccalaureate at the Șaguna High School in Brașov in 1918, he had the opportunity to obtain a subsidy and study abroad.

Attracted by the subject of water, hydromechanics and electrification, Dorin Pavel chose the Polytechnic Institute in Zurich. In 1923 he obtained the position of university assistant and in 1925 he successfully defended his doctoral thesis.

It is the moment when, from Romania, he is called to return to the country for a position as an engineer in hydrotechnical constructions. The young doctor in engineering decides to return to Romania and begins the activity of research, design and education.

This study highlights the role played by the connection of Dorin Pavel with the scientific and technical world of Western Europe, with beneficial results for research and higher technical education in Romania.

Keywords: knowledge movement, engineering education, Dorin Pavel, hydrotechnical engineering

BETWEEN SCIENCE AND TECHNOLOGY DIPLOMACY: EUROPEAN COOPERATION IN NUCLEAR FUSION RESEARCH, 1950S–EARLY 2000S

Roberto Lalli

Politecnico di Torino

roberto.lalli@polito.it

Historians have recently explored the relationships between technoscientific exchange and international relations through the lens of “science diplomacy.” This has enriched accounts of collaboration and competition and highlighted soft power, asymmetries, and hegemonic interests in technoscientific international initiatives. Yet it has only partially intersected with scholarship on how technology contributed to the making of Europe. This talk bridges these traditions by using European cooperation in thermonuclear fusion research to ask how to conceptualize technology—promise, infrastructures, and pathways to application—within science-diplomacy frameworks that often leave the specificity of technology underexamined. After a period in which fusion research was within classified military programs, in the late 1950s it moved into a more open arena after partial declassification, enabling new forms of European exchange. European fusion evolved through a mosaic of national initiatives, cross-border collaborations, and supranational frameworks. Drawing on results from the project “FusEUrope: European cooperation in nuclear fusion research: from history to future policy design,” the talk argues that this configuration fostered a hybrid form of international engagement best captured as technology-led science diplomacy: cooperation justified by scientific agendas but repeatedly reorganized around the long-term prospect of an energy technology. The contribution combines quantitative network analysis of collaborative ties with archival research in national and European collections. It reconstructs how cooperation was periodically reconfigured as actors sought to move from plasma-physics coordination toward reactor-oriented development, negotiating tensions between supranational ambitions and national sovereignty while managing expectations under persistent scientific uncertainty. This yields a long-term periodization from the early EURATOM era to the consolidation of facilities and the institutional preconditions for arrangements leading to ITER, a multinational project building an experimental tokamak in Cadarache (France) to demonstrate key elements of a fusion power plant. In conclusion, the talk shows how historical analysis can be relevant to policy debates. The project’s historical reconstruction informed an experimental survey on public acceptance of fusion technology in six European countries. The results fed into a published policy brief, translating historically grounded insights into policy recommendations on institutional oversight, energy sovereignty, and affordability-oriented communication for fusion-related investments.

Keywords: technodiplomacy, European integration, fusion technology, public policy

INSAID: USING THE HISTORY OF TECHNOLOGY IN EDUCATION

Matteo Torre

Liceo "G. Peano", Tortona (AL) - Italy

matteo.torre1984@gmail.com

This paper presents an educational project called "InsAId," designed to train students and teachers on the more general aspects and operating principles of Artificial Intelligence. The project is being implemented in the 2024-25 and 2025-26 academic years with 15 teachers, two 4th-year high school classes, and two 5th-year high school classes, for a total of 92 students involved. All participants learned about the history of AI, the birth of the concept of neural networks, and, above all, the methods for training neural networks using positive reinforcement and big data. The students rebuilt and trained M. Gardner's hexapedon, Donald Michie's MENACE (Matchbox Educable Noughts and Crosses Engine) box computer, and "smart" cups. The goal was to delve into AI's reasoning method and understand its limitations, so that it can be used more consciously by young students and those working in the educational world.

The activity's "poor mathematical laboratory" approach is an innovation among the many AI educational projects currently in existence in Italy: the construction and manipulation of material models facilitates the discovery of laws and properties. This is further enhanced, in the specific case of InsAId, by the ambition to move into the "reasoning" of neural networks (inside).

Keywords: AI, math education, History of Technology, AI laboratory

RECONFIGURING SOCIOTECHNICAL INEQUALITY: INTERSECTIONALITY AND YOUNG WOMEN'S STEM EDUCATION IN SOUTHERN BRAZIL

Luciana Klanovicz, Ana Ceconi, Taiana Bonadio

Universidade Estadual do Centro-Oeste (Unicentro)

lucianarfk@unicentro.br

This paper examines the initiative 'Mulheres que somam: Impulsionando a Inovação nas Ciências Exatas, Engenharias e Computação' (Women Who Add Up: Advancing Innovation in the Exact Sciences, Engineering, and Computing), in Southern Brazil, as a case study to explore the intersections of gender, science education, and the social history of technology in Brazil. Situating the Brazilian experience within broader debates on girls' and women's exclusion from STEM fields, the paper analyzes how educational technologies both reproduce historical inequalities and open possibilities for their reconfiguration. Drawing on Hughes's concept of sociotechnical systems, we argue that women's unequal participation in STEM is embedded within a broader technological system in which educational institutions, professional cultures, and gender imaginaries operate as structural components. Methodologically, we combine documentary analysis, institutional data, and longitudinal monitoring of participants to assess how educational interventions operate as micro-processes of transformation in school and university settings. In dialogue with international STEM inclusion initiatives, we argue that the Brazilian case illuminates dynamics specific to the Global South, where gender inequalities intersect with class, race, ethnicity, and territorial disparities. In dialogue with international STEM inclusion initiatives, the Brazilian case highlights how intersectional vulnerabilities reshape both barriers and possibilities for technological participation. By reframing educational practice as a sociotechnical arena structured by intersecting systems of power, the seeks to expand the comparative scope of the history of technology and contributes a Global South perspective to transnational debates on gender, labor, and innovation.

Keywords: Intersectionality, STEM Education, Gender and Technology, Science and Technology Studies (STS).

SINO-POLISH TECHNOLOGICAL EXCHANGE IN 1959: PRECAST CONCRETE SHELL STRUCTURES AT JIANGMEN SUGAR PLANT, GUANGDONG AND HALA SPORTOWA, STALOWA WOLA

Heng Xia,

the University of Hong Kong

xiaheng@hku.hk

Designated as China's National Industrial Heritage in 2021, the Jiangmen Sugar Plant (1959) represents a pivotal case of Sino-Polish technological exchange during the First Five-Year Plan period. As China's first large-scale sugar production complex utilizing foreign expertise, its prefabricated hyperbolic paraboloid thin-shell roof - developed with Poland's Central Bureau of Industrial and Agricultural Technology - exemplifies innovative structural engineering rarely seen in China's architectural heritage.

This study employs cross-regional analysis comparing the Jiangmen facility with Poland's Hala Sportowa (Stalowa Wola), utilizing a fourfold methodology integrating archival research, technical drawings, material analysis, and oral histories.

Key research gaps addressed include: structural performance of the thin-shell system, component fabrication techniques, and construction sequencing. The 2017 renovation of Hala Sportowa provides crucial technical benchmarks for this comparative study.

The research contributes to: 1) Preserving undocumented construction knowledge of early thin-shell structures; 2) Reassessing the technological value of Sino-Polish collaborations during the Cold War era; and 3) Establishing a technical genealogy for prefabricated concrete shells in socialist architectural exchange.

Findings offer new insights for industrial heritage conservation and contemporary BRI cultural initiatives.

Keywords: Jiangmen Ganhua Plant, Poland, Technology transfer, Prefabricated hyperbolic thin shells, Tectonic study

TECHNOCRACY IN SOCIALIST YUGOSLAVIA: EXPERTISE, POWER, AND THE LIMITS OF MODERNIZATION

Tijana Rupcic

KTH Royal Institute of Technology, Sweden

rupcic@kth.se

This article examines the rise and dismantling of technocracy in socialist Yugoslavia as a technopolitical formation produced through infrastructures, enterprises, and organizational systems rather than ideology or elite aspiration alone. Situated between capitalist and Soviet models during the Cold War, Yugoslavia developed a distinctive arrangement of self-management socialism that redistributed decision-making authority away from centralized planning bodies and toward enterprises, research institutes, and technical experts. Within this framework, engineers and managers—here termed technomanagers—acquired autonomy not merely as advisors but as decision-makers embedded within technological systems governing production, infrastructure, and international exchange.

Drawing on archival sources, policy documents, and enterprise-level case studies, the article analyzes how technopolitical authority materialized through system-engineering models, export-oriented infrastructures, managerial technologies, and transnational networks of expertise. It argues that the political crisis and purges of 1971–72 constituted a reassertion of state control over these systems, targeting not only individuals but the organizational and infrastructural bases that enabled technocratic governance. The suppression of technomanagers and subsequent constitutional restrictions dismantled the material conditions under which technological autonomy had emerged.

By reframing Yugoslav technocracy as a technopolitical experiment rather than an ideological deviation, this article contributes to global histories of technology and governance, challenging dominant Cold War binaries and highlighting the contingent relationship between technological systems and political authority.

Keywords: Technopolitics, Technocracy and expertise, Cold War modernization, Yugoslavia

THE DIVERGENT ERA OF AUDIO TECHNOLOGICAL INNOVATIONS 1775 – 1914

Ahti Korhonen

University of Helsinki, Doctoral programme for philosophy, arts and society

ahti.p.korhonen@gmail.com

My study examines the emergence and development of audio technology innovations in the 19th century. I refer to the period under review as the divergent period of audio technology innovations (1775–1914). The subjects of the study are the telegraph, telephone, phonograph, film, radio, and television. The common factor among the subjects of the study is sound. In this study, Carlota Perez's theory of technological revolutions and their turning points are examined from the perspective of the development of audio technology innovations. I also use Joseph Schumpeter's assessment of the relationship between invention, entrepreneurship, and society. The assumption is that audio technology innovations arose at the turning points of Carlota Perez's technological revolutions or in the next stage of development. As a result of my research, I present development arcs for audio technology innovations that are related to the divergent period of audio technology innovations. I also examine the connections between audio technology innovations and Jonathan Sterne's theory on the transformation of hearing and listening in the 19th century. The research results relate specifically to technological development, but economic impacts and social needs are also taken into account. I also examine the societal impacts. I create a development curve for each audio technology innovation and assess its length. I divided audio technology innovations into two groups to assess the length of their development arc. The groups were based on commercial and system starting points. The research results on audio technology innovations were created using data analysis. The development cycle of the telegraph is fundamentally the longest compared to other audio technology innovations. The two paradigm shifts of the telegraph occurred at the turning points of the technological revolutions defined by Carlota Perez. Other audio technology innovations followed more general technological developments, but there were exceptions. My research concluded that technological developments and economic events were significant in the case of audio technology innovations.

Keywords: Audio, sound, sound technological innovation, technological eras of sound, technological phases of sound, telegraph

THE HISTORY OF SCIENTOMETRICS: FROM BIBLIOGRAPHY TO INNOVATION POLICY

Angela Repanovici, Liliana Rogoza

Transilvania University of Brasov, Romania

arepanovici@unitbv.ro

Scientometrics, the quantitative study of science, originated in the mid-20th century as bibliometrics and citation analysis. Over time, it developed into a discipline that not only measures scientific output but also informs research evaluation, policy, and innovation strategies.

This paper outlines the historical evolution of scientometrics, from early bibliographic indexes to the institutionalization of citation databases and the digital transformation of knowledge measurement. Drawing on the monograph *Puterea măsurii. Scientometria, fundament al cercetării și inovării* (2025), the presentation highlights how scientometrics became a fundamental tool for transparency, accountability, and strategic decision-making in research systems.

By situating scientometrics within the broader history of technology, the paper emphasizes its interdisciplinary nature and its relevance to contemporary global challenges. Scientometrics demonstrates how methodological innovations can cross disciplinary boundaries, influence governance, and contribute to sustainable knowledge ecosystems.

The history of scientometrics thus illustrates the power of measurement not only to reflect scientific progress but also to shape it, aligning with ICOHTEC's mission to bridge disciplines and perspectives for addressing global challenges.

Keywords: scientometrics, bibliometrics, citation analysis, research evaluation, science policy, innovation systems, digital transformation

THE RELATIONSHIP BETWEEN THE AUTOMOTIVE ELECTRICAL EQUIPMENT INDUSTRY AND TECHNICAL UNIVERSITIES IN ROMANIA. TRANSILVANIA UNIVERSITY OF BRASOV AND ELECTROPRECIZIA SĂCELE BRAȘOV - CASE STUDY

Laura-Mihaela Lelutiu, Marius Daniel Călin

Transilvania University of Brașov, Romania

lelutiulaura@gmail.com

The paper focuses on the relationship between the Automotive Electrical Equipment Industry and Technical Universities in Romania. The connection between the history of technology and education is essentially a story of democratization. Every major technological leap has shifted who gets to learn, what they learn, and where that learning happens. Historically, education and technology have a "co-evolutionary" relationship: technology creates new needs for skills, and education adapts to provide them using those very same technologies. The connection between the automotive electrical equipment industry and Technical Universities in Romania is a historical interdependence. In fact, the industry could not have emerged without specialists from the academies, and the faculties would not have modernized without the technological demand of the factories. This relationship was the engine that transformed Romania from an agrarian to an industrial economy in the second half of the 20th century. The relationship between Transilvania University of Brasov (UNITBV) and the Electroprecizia Săcele Factory is one of the clearest examples of "industrial-academic symbiosis" in post-war Romania. It was not just a formal collaboration, but a fusion of resources that transformed a small workshop into a giant of automotive electrical equipment. Until the 1980s, the connection was so close that many of the patents registered with OSIM had mixed authors: Factory researchers and University professors. Even after the privatization of Electroprecizia Săcele Factory, the connection continues. Today, the company is divided into several holdings, but all of them recruit massively from UNITBV. Moreover, the presence of this historical nucleus (Transilvania University + Electroprecizia) was the main reason why giants like Continental or Vitesco chose to open huge R&D centers in Brașov.

Keywords: Automotive Electrical Equipment Industry, Technical Universities, Romania, Electroprecizia Săcele Brașov

INTERSECTIONS BETWEEN THE HISTORY OF TECHNOLOGY AND OTHER FIELDS OF HISTORICAL STUDY

"UNITY FROM DIVERSITY, CENTRALIZATION IN THE FACE OF PLURALISM": 19TH-CENTURY FORESTS AS ENVIROTECHNICAL SYSTEMS

Péter Szabó

Institute of Botany, Czech Academy of Sciences, Brno, Czech Republic

peter.szabo@ibot.cas.cz

Over the past decades, scholars from both the history of technology and environmental history have searched for conceptual and practical ways to analyse the interconnections between their disciplines. Such efforts were facilitated by the realization that the traditional boundaries between 'nature' and 'technology' were much less clear-cut than earlier research assumed. For environmental historians, the concept of technological systems, as introduced by Thomas Hughes, proved especially useful, as it resonated with the ecosystems view of the environment. Later on, Sara Pritchard developed this connection into the concept of envirotechnical systems to emphasize how ecological and technological systems were intertwined.

The systems approach was successfully applied to environments where technology came more to the forefront, such as large rivers with their regulation works and power dams. However, it is also possible to interpret seemingly less technology-based systems as envirotechnical. European forests in the 19th century offer a prime example of such systems. The major change that occurred in forests in this period through the creation and implementation of scientific forestry has usually been seen as a unidirectional process leading to what forestry itself defined as 'sustainability', with most elements (such as the creation of regular felling patterns or conifer plantations) being simply tools towards the ultimate goal. However, an envirotechnical systems approach provides a deeper understanding of how societal and ecological change interacted and offers constructive parallels between technological systems builders and members of the newly emerging professional class of foresters. In this paper, I will use coeval statistics on forest area, wood prices, population density, wood yield, management type, secondary forest uses, wood export and tree regeneration as well as data on forestry institutions and personnel to show how specific configurations of management practices, people and ecologies came together to radically change 19th-century Czech forests from traditionally managed spaces to centralized, unified and technologized systems. My overarching goal will be to demonstrate how an envirotechnical systems approach can foster the understanding of the transformation of 19th-century forests not so much as a means to tackle resource scarcity as a new way of technology-oriented engagement with nature.

Keywords: environmental history, envirotechnical systems, forests

“CONTROLLING COMFORT: THE SPREAD OF AIR CONDITIONING IN THE MID-20TH CENTURY UNITED STATES”

Michelle Mart

Penn State University Berks

mam20@psu.edu

In 1959, the U.S. Weather Bureau created a new way for Americans to describe their personal environment: “the discomfort index.” The title was soon changed to the cumbersome “temperature-humidity index,” and, later, the simpler “heat index.” The original title is revealing, appealing to the individual sensation and expectation of “comfort,” framing heat as a miserable condition to be measured. The timing of this new measure is also interesting, coming when many public, urban buildings had become air conditioned, but before most individual homes or domestic spaces were.

As domestic air conditioning spread in the 1950s and 1960s, the technological shift raised important cultural questions. Was the assumption of individualized – as opposed to public – climate control inevitable? Did the increased access to artificially cooled spaces change how people perceived heat and domestic spaces? Moreover, what drove the dramatic spread of air conditioning, technological advances or cultural demands?

Along with a focus on attitudes toward air conditioning in this cultural moment, this paper will frame the discussion in the broader, familiar paradoxes of how many revolutionary technologies that improved the experience of daily living had unforeseen consequences. In particular, this paper will address the relationship between individualized cooling and worsening urban heat.

This paper is part of a larger research project investigating the proliferation of six particular technologies in the mid-20th century and their intersection with cultural and environmental changes, at the time and in the decades to come.

Keywords: air conditioning, cultural attitudes, environmental change

A RETURN TO FORGOTTEN EVERYDAY TECHNOLOGIES AS A REGIONAL DEVELOPMENT STRATEGY

Urszula Jarecka

Institute of Philosophy and Sociology Polish Academy of Science, Warsaw

urszula.jarecka@ifispan.edu.pl

Mass production technologies contributed to the development of a consumer society, introducing cheap, widely available items into the everyday lives of all social groups. Since then, there has been no need to make pots, bake bread, or weave homespun cloth for clothing. Craft technologies that made life easier in the pre-industrial era are sometimes preserved in regional folklore, although they are slowly fading into oblivion as consumer society grows. This contributes to the emergence of a generation gap, a break with long-standing traditions, and a loss of cultural continuity. The loss of continuity is becoming a typical phenomenon in contemporary culture. Zygmunt Bauman pointed out that “[...]”. The culture of liquid modernity no longer resembles the cultures based on learning and accumulating knowledge, known from historical and ethnographic descriptions. Rather, it looks like a culture of disengagement, discontinuity, and oblivion.” The traditions cultivated today are undergoing natural processes of transformation and have a completely different character and meaning, as well as a different audience than the original objects or customs. Relict craft technologies such as pottery, weaving, and baking need to be revived in new conditions.

In this paper, the results of field research conducted in various regions of Poland will be presented, focusing on the case of the Olszanica commune in the Bieszczady Mountains. The discontinuity in this region was programmed by the previous socialist system. The Bieszczady Mountains, once bustling with life, were displaced as part of Operation Vistula and turned into forest areas. Tourist trails were laid out on the mountain pastures where villages and towns had stood before World War II. Although not all residents were displaced, their lives were subject to numerous restrictions. Following political transformation, attempts have been made since the 1990s to revitalize and revive the region through agritourism, festivals, events, and creative workshops (partly financed by the EU). However, due to the break in cultural continuity, a return to old traditions proved almost impossible. In the paper I’d like to show how craft technologies are “implanted”, support by new communication technologies, and popularized among community.

Keywords: craft technologies, sociology of culture, consumption, new technologies, social impact of technology

AGREEING ON THE PAST: THE HISTORY OF TECHNOLOGY IN COASTAL REAL-WORLD LABORATORIES

Nils Goseberg¹, Daniel Jankowski², Oliver Lojek¹, David Schürenkamp¹

¹Technische Universität Braunschweig, Leichtweiß-Institut für Wasserbau, Beethovenstr. 51a, 38106 Braunschweig

²Technische Universität Braunschweig, Institut für Geschichtswissenschaft, Bienroder Weg 81, 38106 Braunschweig

d.jankowski@tu-braunschweig.de

Foreland salt marshes as a nature-based solution (NbS) for reducing the impact of storm surges on More coastal protection infrastructure have increasingly become a subject of investigation in coastal engineering. However, researchers often encounter skepticism from civil society and public authorities when taking such solutions into account, not least since government authorities and the coastal population have less trust in NbSs than in hard coastal protection. The rejection is partly rooted in the historical development of this infrastructure on the North Sea coast. Land reclamation, in which fertile marshland is reclaimed from the sea through the construction of groins and sea dikes, has been practiced for over a thousand years across many generations. Today, due to climate change and accelerated sea level rise, the discussion is shifting towards multiple-line coastal defense and managed retreat for sustainable regional development, but this requires a rethink and a change in society. Real-world laboratories or living labs are intended to contribute to overcoming the opposition against NbSs through on-site transdisciplinary exchange. This paper emphasizes that History of Technology can contribute to these transdisciplinary research projects by showing that the use of foreland salt marshes as part of coastal protection along the German North Sea coast, and thereby working with rather than against environmental conditions, has long been part of coastal protection efforts. We argue that historical data on the socio-political negotiation processes and the environmental factors that led to one of the first official implementations of salt marshes as part of coastal protection in Germany in 1978 could contribute to the development of a mutual understanding of the coast's past. Building on this foundation, stakeholders could then collaboratively work toward solutions to future challenges. Through the combination of environmental, technical, and historical knowledge, it is possible to evaluate in a differentiated manner why certain technological solutions prevailed in coastal protection and which forms of knowledge (and modes of communication) are capable of implementing the ecosystemic dimension of technology. Therefore, real-world laboratories and living labs should always incorporate a historical perspective on the landscape to be transformed or on the technology in question.

Keywords: coastal protection, coastal engineering, history of technology, german north sea coast, salt marshes, climate change, 20th century, transdisciplinary, interdisciplinary

BRAIN GAIN: ON ATTRACTING STEM MIGRANTS

Monique Laney

History Department, Auburn University, Auburn, Alabama, USA

laney@auburn.edu

This presentation will introduce my current book project, which will be completed by the time of the conference. It offers snapshots from the book's chapters to illustrate my findings. My hope is that these findings will stimulate questions and discussion about their relevance to other countries, either in reference to their own policies created to attract STEM workers or in reference to their efforts to counter "brain drain" effects of U.S. policies.

Brain Gain: Bringing Skilled Migrants to the United States is a study of the long trajectory of U.S. policies for immigrants with skills in the areas of Science, Technology, Engineering, and Mathematics (STEM) from the late nineteenth century until the late 1950s. It examines the shifts in U.S. policies aimed at skilled migrants and their impact, showing that the foundations and problems of the system that was inaugurated by the 1965 Immigration and Nationality Act were laid long before the period that is typically considered relevant. Beginning in the late nineteenth century when the first federal policies aimed at regulating the import of skilled workers were crafted, Brain Gain illustrates that the main drivers determining policies were shifting priorities given to migrants' race, ethnicity, political affiliation, and skills. By outlining these changes and offering examples for their impact on skilled immigrants, Brain Gain demonstrates how competing national priorities led to controversial decisions, thereby diluting efforts to recruit skilled workers more systematically. The book ends in the late 1950s with an epilogue that discusses the impact of the earlier policies on the 1965 Immigration and Nationality Act and consequent policies, which famously opened the door for STEM workers to immigrate to the United States from around the world. Together with the recent implementation of Canada's merit-based system to select immigrants in 1962, both the US and Canadian approaches to skilled migrants became models for other countries. The subsequent stiff international competition to attract skilled migrants frequently left (and leaves) a skills vacuum in the immigrants' home countries. Examining the history that preceded this situation should open new avenues for inquiry and potentially redress.

Keywords: STEM, migration, policy

DATA IS THE NEW OIL: A POLITICAL COMPARISON BETWEEN THE EUROPEAN COMPUTING INDUSTRY AND THE EUROPEAN OIL INDUSTRY

Marta Musso

La Sapienza University

marta.musso@uniroma1.it

Energy and the computing industry are the two most strategic industries of the 20th century. The debates and attempts to build European-level infrastructures have been a key component of the process of European integration. Amongst the long-lasting challenges are the design, construction and operation of electricity networks, (natural) gas and oil pipelines, as well as computing and telecommunication infrastructures (hardware, software, information highways). The development of know-how, markets, cultures, and specific economic policies have been instrumental in the roll-out of these projects. Scholars have begun to work on the interactions between the energy industry and the computing industry (see the extensive literature on the growing energy usage on part of data and AI centres, Aebischer and Hilty 2014; Bessner 2023 on the role of the oil industry in semiconductors development), but there are not yet studies that compare the history of their development as strategic sectors. This paper compares how these two industries were approached and developed in Europe. Notwithstanding a second-comer disadvantage and the lack of domestic primary resources, European countries were able to develop in the first half of the 20th century a strong oil industry with globally competitive actors (such as Total, BP, ENI). On the contrary, it failed in developing international tech giants with the digital revolution. This paper explores the history of some of the main computing industry projects in France, Italy, and at a European level (Plan Calcul, Olivetti, ESPRIT) in open comparison with the development of the oil giants, reflecting on the endogenous and exogenous reasons why Europe failed at developing Big Tech that can be compared to the US.

Keywords: Oil industry, computing history, technology development

DATA STRUCTURES OF EXTINCTION: AUTHORITY AND THE MAKING OF GLOBAL CONSERVATION

Sotiris Mikros

University of Manchester, Center for the History of Science Technology and Medicine, Manchester, UK

sotirios.mikros@postgrad.manchester.ac.uk

Species extinction constitutes one of the most urgent global challenges. Scientific knowledge in this field is largely built on data organised, classified and disseminated through threatened species lists, datasets, and tools such as the IUCN Red Data Books and the IUCN Red List of Threatened Species. This paper examines the formative years of the International Union for the Conservation of Nature (IUCN), founded in 1948, during which the construction of expertise through the collection, management, and classification of threatened species data became central to building global influence and authority in species conservation. Drawing on the intersection of the history of science and technology and environmental history, this paper moves beyond treating data as neutral objects. Instead, it adopts a relational perspective that highlights how data reflect their origins, purposes, and absences, thereby shedding light on the transnational scientific data networks operating across national, institutional, and epistemic boundaries through which knowledge of species conservation was produced and circulated.

As part of my PhD research and in line with the objectives of the NEWORLD@A ERC project, this paper reinterprets the years leading to the IUCN's establishment as a politically charged process of centralisation, the reproduction of global asymmetries, and diplomatic positioning within a shifting global order. It argues that threatened species data were embedded in and co-produced with the shifting political priorities of powerful actors during the inter-war, early Cold War and decolonisation period, U.S. soft-power projection, and the preservation of colonial asymmetries repackaged as global cooperation and implemented by hybrid transnational networks. It sheds light on the processes that facilitated this co-production, including inter-organisational relations in the field, data-gathering practices, and missions dedicated to threatened-species data collection, organised and implemented by the IUCN. It aims to contribute to a deeper historical understanding of threatened-species data practices and of how historical configurations of global inequality continue to shape them. The paper aims to clarify the nature of the data on which species conservation relies, so the field can confront its history, acknowledge long-standing shortcomings, and improve upon them.

Keywords: threatened species, data, IUCN, science diplomacy, transnational scientific networks

DISPOSABLE PLASTIC SYRINGES AND THE DAILY WORK OF GRASSROOTS MEDICAL WORKERS: A STUDY BASED ON THE EXPERIENCE OF RURAL DOCTORS IN CHINA

Fanxiang Min

Nanjing University

fanxiangmin@nju.edu.cn

The advancement of modern medicine is inextricably linked to innovations in materials science, with suitable materials serving as the critical bridge between theoretical medical knowledge and practical clinical efficacy. Beyond merely upgrading therapeutic tools, the adoption of new materials fundamentally reshapes the professional routines and work structures of medical practitioners. The introduction and mass proliferation of plastics in healthcare have not only overcome the inherent limitations of traditional materials like glass and metal—such as fragility, high sterilization costs, and cross-infection risks—but have also catalyzed the transition into an era of “Plastic Medicine,” marked by unprecedented safety and efficiency.

This paper focuses on the transformative impact of disposable plastic syringes on the daily work of rural doctors in China, a group that has been at the forefront of implementing primary healthcare reforms. Employing the theoretical frameworks of social history, micro-history, and comparative history, this study conducts a systematic comparison between the “glass syringe era” and the “plastic syringe era.” By integrating a diverse range of sources, including official archives, medical literature, memoirs, literary works, and oral history interviews, it reconstructs the nuanced changes in the working lives of these grassroots clinicians.

The research argues that the shift to plastic syringes did more than just improve clinical safety; it drastically simplified labor-intensive sterilization procedures, reduced physical burdens, and altered the doctor-patient interaction dynamic. This paper innovatively highlights the material dimension of medical work, demonstrating how a seemingly simple technological object redefined the professional experience of rural doctors. In doing so, it offers a unique perspective from the grassroots doctors’ work experience, enriching the international historiography of plastics by illustrating its profound social and practical implications in the context of primary healthcare.

Keywords: Disposable Plastic Syringes, grass-roots medical workers, Daily Work, Work Experience, the Experience of Rural Doctors in China

ENVISIONING A GREEN FUTURE: RETHINKING INDUSTRIAL PROGRESS IN THE UKRAINIAN COAL INDUSTRY

Katerina Szylo

Faculty of History, University of Oxford, Oxford, UK

katerina.szylo@history.ox.ac.uk

Amid the reforms of glasnost and perestroika, rethinking “progress” became central in the discourse of technological innovation in the Soviet Union. Through this redefinition, industrial “progress” became tied to sustainability over growth. Key to producing this longevity was an emphasis on environmental impact. While environmental diplomacy became part of Soviet strategy on the international level, Soviet workers took note of environmental issues present at the local level. Stalled by the lowering of coal production due to overuse and environmental degradation, Donetsk, Ukraine, felt this redefinition of “progress” firsthand, particularly within the coal industry. Inspired by Mikhail Gorbachev's 1988 United Nations speech, “Ecological Diary,” a column featured in the regional Communist party newspaper, Socialist Donbas, was first published on February 11, 1989. The column reveals how the local population of Donetsk ascribed environmental problems that arose from industrialization to a domestic level. Although Gorbachev's assessment of the “appalling” state of the environment was meant to address “underdeveloped” countries, the people of Donetsk, which included workers, managers, community leaders, doctors, scientists, and local governing bodies, took it upon themselves to reveal that the situation also applies to their own community, specifically in the context of industrial pollution. While this column reveals immense environmental degradation, it also focuses on hopes to improve the environment through community-led initiatives. “Ecological Diary” demonstrates a growing civic empowerment that was allowed to flourish under glasnost and perestroika and highlights the need to address environmental issues of industrialization at the local level. The column also offers an interesting comment on both the readability and the willingness of citizens, particularly workers, to participate in environmental debates. These workers focus on progress not through increased industrialization, but by providing future generations with a sustainable and safe environment. This research provides a relevant study with present-day implications of the relationship between industrialization and environmental protection.

Keywords: Coal, Ukraine, Soviet Union, Environment, Industrialization, Labor, Activism

FLORA AND THE IMPERIAL MACHINE: PLANT LISTS AS TECHNOLOGIES OF ECOLOGICAL CONSTRUCTION

Nathan Cornish

University of Southampton, Exeter University, Royal Botanic Gardens Kew

n.j.cornish@soton.ac.uk

This paper explores the intersection between technology studies and environmental history through the plant exchange lists that were used to record and conduct botanical trades through Kew Botanic Gardens (London) between 1800 and 1811. I argue that they can be fruitfully re-situated as a technological system which extracted, accumulated, and re-situated plants into new imperial ecologies.

The scientific records of imperial botany have been a rich subject of analysis for scholars of empire and environment. Attention has importantly been drawn to the Wardian case as an ecological technology (Keogh 2020) and I extend that idea into the wider infrastructure of imperial botany. This allows me to show how plant records accompanied physical infrastructure in holding some of their own agency in the process of imperial botany.

To illustrate this, I have chosen three lists from between 1800 and 1811 that characterise the way plant trades en masse were integrated into Imperial ecology through plant records. The first is a shipment to Kew from the botanical garden in Coimbra (Portugal) negotiated through the personal network of their patrons. This introduces plant catalogues as representations of gardens and their role in genteel exchange connections. My second list introduces the movement of living plants into that botanical garden system from Chinese Imperial Ecology through Canton. This case study presents exchange lists as translation technologies for the acquisition of ecology. Third, with most plants received as seeds, I introduce a list of plants sown at Kew in 1811. This final case study connects the ephemeral lives of plants with the longer lasting archive of knowledge and data technologies that were developed through their acquisition and cultivation.

Drawing these examples together, the combination of data technology history and environmental humanities offers crucial insight into the way ledgers and lists shaped the living material of the British Empire. Plants had their own finicky lives and deaths in spite of Botanists' dreams of accumulation and improvement of nature. Kew's exchange ledgers survive as the mediator of this relationship and consequently a key contributing force to the development of imperial ecology.

Keywords: Environmental history, information technology, paper technology, Botany, Plant Humanities

FROM CALCULATION TO COMPUTATION: ALGORITHMS, CALCULI, AND THE TRANSFORMATION OF SCIENTIFIC KNOWLEDGE IN THE TWENTIETH CENTURY

A.S. Almeida

Institute for Interdisciplinary Research, University of Coimbra, Portugal

aspsalmeida@gmail.com

The computational revolution is often framed as a radical rupture in scientific knowledge and practice. This paper advances a perspective of historical continuity, arguing that twentieth-century computation emerged from long-standing traditions of calculation grounded in abstraction, quantification, and formal rigor. Rather than displacing earlier modes of reasoning, computation developed through a socio-technical transformation shaped by technical innovation, human judgment, and institutional embedding.

Drawing on four case studies— from Turing and early Artificial Intelligence (AI) to numerical weather prediction, nuclear physics simulations, and gendered practices of calculation in astronomy—the paper traces how calculative practices were formalized, mechanized, and reorganized across diverse scientific domains. Taken together, these cases reveal recurring patterns in the evolution of computation, highlighting continuity alongside reconfiguration in how knowledge was produced, validated, and trusted.

The paper makes three contributions to the history of technology and related historical fields. First, it reframes the computational “revolution” as a historically continuous process, tracing the transition from manual and embodied calculation to formalized algorithms and programmable machines. Second, it examines the technical transformation of calculation through symbolic calculi, numerical methods, and mechanized devices, showing how standards of rigor, reliability, and trust were reshaped without displacing human expertise. Third, it situates computation within its institutional, political, and cultural contexts, demonstrating how epistemic authority was redistributed among humans, machines/computers, and organizations.

This historical perspective has enduring relevance for contemporary debates over algorithms, artificial intelligence, and automation, which often portray computational systems and technologies as autonomous, neutral, or inevitable. By foregrounding continuity, the paper challenges such narratives, showing that epistemic authority, reliability, decision-making, and trust in computational systems are historically situated and socially mediated. Situating current technological debates within a longer history of calculation and institutionalization, the paper underscores how questions of power, expertise, and trust interplay and remain central to human–machine relations.

Keywords: computational revolution, epistemic authority, scientific computation, human–machine interaction, socio-technical systems, institutionalization of knowledge, algorithms, calculative practice

FROM CANNONS TO STEAM ENGINES: THERMODYNAMICS, POWER, AND THE SOCIAL REORGANIZATION OF TECHNOLOGY

Antonino Drago

University of Naples, Italy

antonino.drago.38@gmail.com

This paper examines the birth of thermodynamics as a transformation in the social and technological meaning the power of military cannons. In the eighteenth century, cannons embodied the highest form of technological power and became symbols of revolutionary rupture and domination. Early nineteenth-century studies of heat engines followed this military model, treating them as devices capable, in principle, of producing unlimited power. Against this background, Lazare Carnot challenged the ideological promise of boundless power, emphasizing the limits inherent in all machines. His son, Sadi Carnot, initially adopted the dominant military conception in a first paper on the efficiency of an heat engine, but later reversed it in his *Réflexions sur la puissance motrice du feu*. By introducing notions such as reversibility, cyclic operation, and efficiency limits, he articulated a new technological rationality incompatible with war machines. His theory was also alternative to Newton's mechanics which suggests 1) through the inertia principle an unlimited motion, in addition determined with an absolute precision in its magnitude and direction; 2) through its second principle the metaphysical notion of force-cause; and 3) later in Laplace's thought the claim to describe the entire past and future evolution of a mechanical system. Notice that Carnot's theoretical basis, potential infinity and a theoretical organization aimed at solving a problem, is opposite to Newton's, actual infinity of infinitesimal analysis and a theoretical organization starting from three principles from which deductively all consequences are drawn. In conclusion, this case-study represents an instance of historical, philosophical and foundational incommensurability between two theories. Thermodynamics thus emerged not merely as a scientific theory but as a reorganization of technological practice and social expectations: from destructive power toward regulated, conservative, and civil uses of energy. This shift reflects a broader reconfiguration of science–technology–society relations and highlights the incommensurability between military and civil technological attitudes.

Keywords: Thermodynamics, Power, Civil Technology, Military Technology

HYDROELECTRIC LANDSCAPES: RETHINKING SUSTAINABILITY THROUGH THE HISTORY OF ENERGY INFRASTRUCTURES

Elisa Angeles Fernández

Historical Laboratory of (Electro)Technology, Faculty of Electrical Engineering, Czech Technical University in Prague

angeleli@fel.cvut.cz

The work examines how historical hydroelectric infrastructures can contribute to contemporary debates on global challenges (such as sustainability and environmental justice) without reducing the past to a mere precursor of present concerns. Drawing on case studies from Mexico developed between the late nineteenth and early twentieth centuries, this work aims to understand hydroelectric systems not only as technical achievements but as historically situated socio-technical landscapes shaped by transnational knowledge flows, territorial transformations, and contested notions of progress.

Instead of treating sustainability as a timeless concept or idea, this paper understands it as something shaped by its historical context. It explores how ideas about resource use, efficiency, and environmental control were defined in specific moments in the past, and how they differ from today's sustainability debates. In doing so, the paper questions linear views of technological progress that present early hydroelectric projects simply as early steps toward current energy transitions.

The methodology combines the analysis of physical infrastructures (such as power plants, dams, and water channels), with an approach that links local landscapes and communities to national policies and international networks of engineers, entrepreneurs, and technologies. Giving special attention to the movement of hydroelectric knowledge, showing how technical expertise was adapted to local geographic, social, and political conditions rather than copied directly.

Looking to understand hydroelectric infrastructures as energy landscapes, the paper highlights their long-term environmental and social effects, as well as the memories and silences they have produced. These continue to influence how energy and development are perceived today. This approach allows the history of technology to engage critically with current global challenges while remaining attentive to historical differences.

Lastly, the paper argues that historical energy infrastructures matter because they reveal how societies have negotiated the relationship between technology, nature, and power over time. By examining these processes, the history of technology contributes to more historically informed and socially grounded discussions of global challenges.

Keywords: Hydroelectric infrastructures, History of Technology, Energy landscapes, Transnational knowledge circulation, Sustainability (historical perspective),

IMPLANON: AN INTERREGIONAL HISTORY OF CONTRACEPTIVES AND MOBILE CLINICS IN ETHIOPIA AND SOUTH KOREA

Young Su Park

Assistant Professor, Department of the History of Medicine and Medical Humanities, Seoul National University, Korea

youngsupark@snu.ac.kr

This interregional history traces the legacies of the South Korean Developmental State, revealed in the transfer of technology of reproduction and mobility in family planning projects in Ethiopia. Implanon (a long-acting hormonal birth control implant) was extensively promoted for Korean government-funded family planning projects in Ethiopia from 2008 to 2018. USAID mobilized IUD (intrauterine device) insertions on a massive scale for family planning and population control in South Korea during the 1960s. At the time, mobile clinics handed over by USAID were instrumental in sweeping the entire nation for mobilizing rural women for the purpose of family planning. In 2016, KoreaAID, the new international development initiative of the South Korean government, introduced a series of mobile clinics in Ethiopia. For a conservative Korean political audience, mobile clinics in Ethiopia evoked memories of the mass mobilization of family planning under the Korean developmental dictatorship. Family planning mobilization in South Korea reflected the governmentality of the developmental state: temporal urgencies, sacrifices by individuals for the state, the violent nature of its processes, and Cold War interventionism. The ruling party of Ethiopia is a strong proponent of the Korean developmental state model. The failed family planning of South Korea, which was conducive to the current population crisis of low fertility and the burden of care for an aging society, transmogrified into an essential component of the succeeded Korean development model in Ethiopia. The current Ethiopian regime ardently promotes long-term family planning as a population control policy, which the Korean government adopted during the 1960s. Implanon and mobile clinics reflected the continuing legacy of the Korean Developmental State in its rash implementation processes and violent consequences in contemporary Ethiopian family planning projects.

Keywords: Implanon, Intrauterine Devices, Mobile Clinics, Family Planning, Developmental State, Ethiopia, Korea

INFRASTRUCTURAL MEMORY: A MNEMOTECHNICAL HISTORY OF STARI MOST AND BURNTOLLET BRIDGE

Aviva Weizman

Communication & Culture, York University, Toronto, Canada

aweiz@yorku.ca

The relationship between memory and technology reaches back through antiquity. While the significance of classical mnemotechnics has been consistently acknowledged in the field of Memory Studies (Assmann, 2011; Erll, 2011), contemporary scholarship tends to focus on cultural memory practices, obscuring the entangled evolution of technical systems, memory and culture (Hughes, 2012; Stiegler, 1998). Drawing on my ongoing doctoral research that examines Stari Most (Mostar, Bosnia-Herzegovina) and Burntollet Bridge (Co. Derry, Northern Ireland), two sites that have been destroyed and rebuilt in the recent past, this presentation will explore how memory is constructed and reconstructed through ever evolving mnemotechnical infrastructures.

Based on the premise that monuments can act as politicized mnemotechnologies (Jackson & Wright, 2014; Hogue, 2021), my paper asks: How might infrastructural technologies like Stari Most and Burntollet Bridge act as mnemonic devices? How have their commemorative representations been augmented or (re)mediated by political wills, historiographical considerations and technological developments? To address these questions, I will begin by presenting findings from fieldwork conducted over the past two summers in Bosnia-Herzegovina and Northern Ireland. Beyond simply providing historical context, the selected archival documents, newspaper clippings and interview data presented in this talk will highlight how these contested infrastructural sites relate to larger technological systems of memory at local, regional and international levels. This paper will conclude by further developing my concept of “infrastructural memory” which has the potential to bridge the gap between the disciplines of Memory Studies and Science and Technology Studies.

Keywords: Memory, Infrastructure, Bridges, Mnemotechnics, Northern Ireland, Bosnia-Herzegovina

LISBON ELECTRIC TRAMWAYS AS SEEN THROUGH THE LENSES OF PHOTOGRAPHERS FROM THE LISBON TRAMWAY COMPANY

Alexandre Ricardi

Postdoctoral researcher, History of Art Department, UNIFESP, São Paulo, Brazil

alexandre.ricardi@unifesp.br

This presentation is part of postdoctoral research at the Department of Art History at UNIFESP to retrace the trajectory of public transport in Lisbon based on photographic collections commissioned by the Companhia Carris de Ferro between 1900 and 1910, when the network was electrified by Lisbon Electric Tramways.

It begins with the development marked by profound transformations, the service maintained by Carris since 1873, how it affected the urbanization of Lisbon, fundamental to how it spread geographically, and how images were used to convince the population that the disruptions caused were inevitable for it to become a modern city.

Photographic technology developed relatively quickly, from Niépce's first photograph in 1826, which took eight hours to produce, to the first camera with a roll of film for 100 exposures in 1888, a precursor to portable cameras, only 60 years passed. In contemporary times, the era of the image for some, the digital image has transformed social relations more profoundly.

In the context of art history, W.J.T. Mitchell (2010) proposed a new methodology, linked to what he himself called the “pictorial turn”. In a society increasingly dependent on the image, it becomes a crucial axis for the human sciences, particularly in visual studies. The image, a painting, a photograph, or those created by computer, has the power to influence institutions, values, and social relations. The image naturalizes a social and cultural construction, representing an artificial world as if it were simply given and inevitable.

If, in the words of Ortega y Gasset (1961), technology is the production of the superfluous, not exactly stemming from human needs (BASALLA, 2001), photography ends up becoming an ode to the superficial. This only if we disregard the contributions it has also made to current societies, some of which we intend to recall.

Just like electrification, which in the modern cities was a relevant factor in the transportation of workers and the circulation of goods and merchandise, these are a good example of how the history of technology shows how utilities are created and can no longer be discarded in the 21st century, even if considered superfluous.

Keywords: urban photography, History of electricity, public property, Lisbon, public transport

LISTENING TO THE “MURMUR OF THE THOUSAND VOICES OF SACRIFICE”: DAM-INDUCED DISPLACEMENT AND THE BUILDING OF PORTUGAL’S ELECTRICAL POWER SYSTEM DURING THE FASCIST NEW STATE REGIME (1933-1974)

André Pereira

CIUHCT (Interuniversity Centre for the History of Science and Technology)

latpereira@gmail.com

The construction of the portuguese electrical system during the fascist dictatorship of the New State (1933-1974) caused the mass displacement of several rural populations. In 1944, the regime established the premises for the “Electrification of the Country” with Law n.º 2002, an endeavour that demanded for the building of numerous arch dams throughout Portugal’s mainland territory, often submerging several small villages and forcing their inhabitants to migrate and resettle in new locations.

Although these dam-induced displacements can be framed within the broader trend of mass-migration being used by the New State as a tool to reshape and manage the territory, they warrant analysis as a phenomenon in their own right. Resettlement and compensation processes for dam-displaced peoples instigated episodes of resistance and created opportunities for negotiation, confronting different—but not necessarily opposing—visions for the reshaping and inhabiting of the territory. While both system-builders and rural populations accepted the “sacrifice” of rural villages implied with dam-building—even sharing a sense of “technological sublime” at times—, conflicting environmental visions arose when it came to establishing the means through which to compensate the displaced. Throughout the decades, companies oscillated between disregarding resettlement altogether and integrating it into the system-building of the electrical power grid; populations presented conflicting views regarding resettlement and expressed anxiety towards the ability to maintain their way of life in the post-dam landscape. These conflicts were often acknowledged by state and corporate representatives, who attempted to shape legislation recognizing large-scale displacement and land expropriation, and weaving them into territory management laws. In a few instances, resettlement demanded the involvement of the Church.

By focusing on the conflicting visions intersecting in episodes of dam-induced displacement in mainland Portugal during the New State regime, I provide insight into an often disregarded aspect (and consequence) of the construction of the portuguese national electrical power grid, shedding light on how the understanding of dam-displacement evolved throughout the decades of the dictatorship, how it was instrumentalized toward the shaping of the territory, and how it came to be reshaped during the democratic period beginning in 1974.

Keywords: dam-induced displacement and resettlement, new state, conflict, resistance

MAPPING PRODUCERS UNDER ENERGY CONSTRAINT: BUILDING MATERIALS IN PALESTINE/ISRAEL, 1922-1967

Hadar Porat

Technion Israel Institute of Technology

po.hadar@gmail.com

Modern construction relies on cement, steel, and glass, materials whose manufacture requires continuous, high-energy input. While contemporary climate debates often frame these as neutral technologies awaiting technical substitution, their persistence also reflects the institutional and economic arrangements that historically stabilised them. This paper examines how energy access and state economic governance shaped the consolidation of energy-intensive building-materials production in Mandatory Palestine and early-state Israel between 1922 and 1967.

The period offers an unusually clear view of the intersection between technology, political economy, and industrial development. Under the British Mandate, Palestine was integrated into an imperial fuel corridor anchored in the Iraq Petroleum Company's Kirkuk-Haifa pipeline system, refinery complex, port facilities, and rail connections. After 1948, Israel pursued energy autonomy under conditions of chronic constraint: fluctuating coal and oil supply, austerity measures in the early 1950s, the macroeconomic effects of the Reparations Agreement, accelerated industrial investment in the 1960s, and a major inflation crisis by 1966. In this setting, fuel constraints directly shaped prices and intermittency in key building inputs, making materials markets a recurring site of political and economic contestation.

Industry outcomes, who produced, at what scale, and under what competitive conditions, were driven less by efficiency or modernisation than by policy tools that allocated fuel, licensed production, and channelled public procurement. As construction demand repeatedly outpaced energy supply, these mechanisms increasingly favoured a dominant actor: the Histadrut-owned construction firm Solel Boneh and its industrial arm Koor, which consolidated key production chains while formal discourse maintained the appearance of open markets.

Methodologically, the paper builds a new qualitative industrial-economic dataset by mapping producers, corporate genealogies, production sites, and declared capacities across scattered printed sources (including trade catalogues and advertisements) and archival records and aligning them with turning points in energy and industrial policy. The result is the first systematic reconstruction of the sector's firm ecology over time, enabling a grounded account of when concentration hardened into a durable structure and which governance instruments helped produce it.

Keywords: Energy-intensive building materials, Infrastructure networks, Construction industry, State-led industrialization

PRECISION AS POWER: HIGH-TECHNOLOGY MEASUREMENT AND THE MAKING OF INTERNATIONAL STANDARDS (1930–1960)

Sara Bassanelli

Politecnico di Torino

sara.bassanelli@polito.it

Throughout the twentieth century, standardization became a crucial component of techno-scientific practices. The stabilization of units, constants, and measurement procedures underpinned industrial production, electrical networks, telecommunications, and later nuclear and electronic technologies. Far from being merely technical conventions, standards were material infrastructures sustained by high-precision instruments, calibration chains, and laboratory systems whose development required substantial investment and continuous international negotiation over authority and reliability. This paper examines how advances in measurement technologies reshaped international agreements over physical standards and, in doing so, contributed to the formation of durable hierarchies in global data exchange. Focusing on two interconnected arenas—the interwar debates on electrical units and the early Cold War harmonization of atomic constants—it shows how global data asymmetries characteristic of the Cold War were rooted in earlier technological competitions over standard-making. In both contexts, technological innovation and standardization progressed in tandem: new devices enabled greater levels of precision, while the quest for internationally recognized standards stimulated further technological development. The capacity to design, manufacture, and maintain advanced measurement technologies became a strategic asset. Nations able to export precision instruments and anchor international calibration chains gradually consolidated structural advantages. In particular, U.S. institutions leveraged their industrial base and laboratory infrastructures to position themselves as indispensable nodes in emerging global measurement networks, translating technological capacity into epistemic and diplomatic authority. Reframing physical standards as technological-diplomatic objects highlights how measurement infrastructures operated simultaneously as tools of cooperation, instruments of governance, and mechanisms of power—bridging the history of technology with political, economic, and scientific history, and illuminating the technological roots of enduring global asymmetries in the circulation of scientific data.

Keywords: standardization, science diplomacy, electrical units, atomic constants

STONES UNDERFOOT: A HISTORY OF PAVING TECHNOLOGIES AND THE MAKING OF URBAN EXPERIENCE

Berrak Karaca Şalgamcıoğlu¹, Yasemin Armağan Emiroğlu², Elif Korkmaz², Gamze Cakir³

¹*Istanbul University, Faculty of Architecture, Department of Industrial Design, İstanbul, Turkey*

²*Iston Co., Department of Design, Istanbul Metropolitan Municipality, İstanbul, Turkey*

³*Iston İstanbul Beton Elemanları ve Hazır Beton Fabrikaları Sanayi ve Ticaret A.Ş.*

berrakk@istanbul.edu.tr

This paper examines the history of paving technologies as a foundational yet often overlooked component of urban technological systems, arguing that paving materials and construction techniques. Streets, sidewalks, and squares are often treated as neutral backdrops for urban life; however, this study positions paving stones and surface technologies as active mediators of movement, perception, and social interaction. Primary sources, including municipal regulations, technical manuals, planning documents, and visual records such as historical photographs, are analyzed to trace how paving technologies were designed, standardized, implemented, and maintained over time. Rather than approaching paving as a fixed technical solution, the paper examines it as a distributed technological system shaped by administrative decisions, labor practices, and everyday use. This perspective allows the analysis to connect technical specifications with lived urban experience, showing how formal standards and material choices translate into bodily movement, sensory perception, and daily interaction with urban space.

Within this framework, the paper traces the evolution of paving practices from handcrafted stone surfaces to industrially produced paving blocks and contemporary engineered materials. It examines how shifts in paving technologies were driven by changing urban priorities, including circulation efficiency, hygiene, durability, and environmental management. The transition from irregular stone pavements to standardized modular systems is situated within broader processes of rationalization, standardization, and infrastructural modernization.

The paper further explores how paving technologies shape embodied urban experience. Paving stones are thus understood not merely as construction elements but as interfaces mediating relationships between bodies, technologies, and urban space. Methodologically, this section relies on an interpretive reading of visual records, such as photographs, maps, and visual surveys, to address embodied effects not explicitly documented in written sources.

Finally, attention is given to maintenance, repair, and replacement practices. Uneven surfaces, temporary patches, and material mismatches are interpreted as visible traces of infrastructural care, neglect, and power relations. By situating paving technologies at the intersection of material culture, environmental history, and everyday life, the paper contributes to debates on ordinary infrastructures and urban technological change, demonstrating how mundane materials profoundly shape urban experience over time.

Keywords: History of Paving Technologies, Paving Stones, Urban Experience

TECHNOLOGIZING THE IRRIGATION AND AGRARIANIZING OF THE THAR DESERT

Lalit Kumar

PhD Scholar (History), School of Liberal Studies, Dr. B.R. Ambedkar University Delhi, New Delhi, India

lalitkumar442211@gmail.com

Technologies, at various levels and scales, have shaped and continue to shape society, economy, politics, environment, and our daily lives. In the present Anthropocene era, understanding the history of technology becomes even more crucial, given the visible instances of climate change, ecological shifts, and environmental changes at local, regional, and global levels. This paper explores the environmental and socio-economic implications of a technology-based method of irrigation, that is, the Indira Gandhi Canal in the arid region of the Thar Desert in India.

The Thar region in South Asia, popularly known as the Great Indian Thar Desert is a vast expanse of arid plain covered with undulating sandhills, thorny shrubs and bushes situating in north-western South Asia. Aridity, scarcity, and dryness are the core characteristics of the region where there is no perennial source of water, rainfall is inadequate, and agricultural production is low. However, under these environmental conditions, pre-modern societies developed methods to harvest rainwater for both drinking and irrigation purposes, which are well-documented. The historical knowledge of environmental technology shaped an ecologically sustainable economy. Based on their knowledge of the environment and technology, the inhabitants maintained an ecologically sustainable and reliable economic system.

This paper examines the role of technology in transforming the environmental landscape of the Thar Desert. The state in post-colonial India introduced modern technology in irrigation, which not only strengthened agricultural production but also transformed the overall geographical landscape, and thereby impacted the ecological settings of the desert. The paper observes that with the increasing trend of technologized irrigation in agriculture, other means of rural livelihoods (pastoralists) are being affected, which were earlier the backbone of the economy of the Thar Desert.

Keywords: Arid, Agrarian, Canal, Irrigation

TECHNOLOGY AND WEAPONRY IN THE BALKAN WARS (1912-13)

Doxakis Komitis

PhD in Military history and military history didactics

komitisdoxakis@hotmail.com

War is a human activity whose evolution is inextricably linked to technological achievements. The weapons systems utilized in a conflict constitute the means of destruction, analogous to the means of production used for creating economic goods and services. It is understood that possessing modern—and thus more lethal—weaponry is a crucial factor in determining the combat power of any side. Frequently, this advantage can be so decisive that it contributes to victory more than any other factor. At the beginning of the 20th century, the Balkan nation-states, in their effort to achieve full independence from the Ottoman Empire, pursued intensive armament policies, eventually acquiring some of the most advanced weapons systems of the era. This presentation highlights the weaponry used by opposing armies during the Balkan Wars of 1912-13 and analyzes how these capabilities influenced the outcome of the conflicts. Particular focus is placed on artillery capabilities, providing a comparative examination based on technical characteristics and innovations. These technical features represent the objective capabilities of the guns—specifically caliber, range, rate of fire, and weight—and are distinct from the tactical skill or heroism of the combatants. Furthermore, the presentation argues that the control of the "means of destruction," unlike the means of production, is a state prerogative. The possession of such means, whether through domestic development or procurement, is a factor of national power related to a state's perceived threats or imperialist policies. However, a state's ability to design and produce weapons systems is inherently tied to its industrial capacity, and by extension, to the industrial means of production held by the private sector. This presentation will not address the causes or pretexts of these specific wars, nor will it focus on ethnic rivalries or detailed battle descriptions.

Keywords: Military Technology, Balkan Wars, Weapons Systems

TECHNOLOGY, STATE POWER AND BORDER GOVERNANCE

Lamprini Bikou

University of Reading

lina_bikou@hotmail.com

The intersection of politics and technology has a long history. From territorial demarcation and cartography to the formation of the modern state through passports and digital surveillance systems, technologies have mediated state authority. Yet there is a site where these two meet, and not only affect social spectrums, they can define life and death, identity, and determine an individual's future; the border. Borders thus serve as sites where the relationship between state power and technology becomes visible and analysable. In light of technological advances, contemporary border technologies enable screening before physical crossing occurs; simultaneously, state power itself is increasingly constituted through these technological systems. These technologies are not autonomous; they embody particular logics and constraints that, once operationalised, generate effects beyond initial design, reconfiguring new sites where state authority and power are mediated through technological mechanisms. The purpose of the paper is to provide an understanding of modern borders by analysing them as contemporary forms of institutional materiality. To this end, the paper emphasises the historical relationship between technological development, state authority, and border governance. The Evros borderland, where Greek state authority operates through biometric identification, algorithmic risk assessment, and surveillance infrastructure, renders this historical co-constitution empirically legible. By examining the Evros borderland, this investigation reveals how state power materialises through and is shaped by the operationalisation of technological procedures, and how contemporary configurations of power are associated with technological and organisational developments.

Keywords: state power, border governance, technology

THE HISTORICAL ALLIANCE OF TECHNOLOGY AND POWER: TECHNOLOGIES OF POWER, SOCIAL EPISTEMOLOGY

Henrieta Serban

Full Member, ROMANIAN COMMITTEE FOR THE HISTORY AND PHILOSOPHY OF SCIENCE AND TECHNOLOGY OF THE ROMANIAN ACADEMY (CRIFST), Bucharest, Romania; Senior researcher, PhD, INSTITUTE OF POLITICAL SCIENCES AND INTERNATIONAL RELATIONS „ION I.C. BRĂȚIANU” (ISPRI) of the Romanian Academy, Bucharest, Romania; Senior Researcher PhD Hab, INSTITUTE OF PHILOSOPHY AND PSYCHOLOGY „CONSTANTIN RĂDULESCU-MOTRU” OF THE ROMANIAN ACADEMY; Correspondent Member, PhD Hab, ACADEMY OF ROMANIAN SCIENTISTS

henrietaserban@gmail.com

The alliance between social and political power and technology is present since the dawns of times and it can be attested historically at every stage in the history of mankind. One may immediately recall what we have learned about the role of technologies such as irrigation or writing as early as the Brone Age Mesopotamia for the assurance of a consolidate elite and of a stable state capable to provide order, property rights and food security. The correlation between technology and power is „natural”; in fact, it became naturalized throughout human history along the path of development of mankind. Technology proved itself historically as a reliable catalyst of progress and prosperity, consolidating elites and sealing the social contract. While technology offers progress, prosperity, social influence, security and control, fueling the legitimation for power, it needs the acknowledgement, financing and accept of power for advancement and insertion in society. Technology isn't neutral and we may follow Michel Foucault's philosophy concerning “technologies of power” or the current AI and AI surveillance phenomenon, also via the philosophical Foucauldian lenses, to emphasize once again technology as a tool that reflects and reshapes power for states and corporations through data analysis, raising significant privacy and control concerns. Finally, a relevant discussion about social epistemology and Science and Technology Studies (STS) engages cutting-edge ideas from Steven Fuller and Richard Rorty, summarized by the social and humanistic concern for relevant and human future-oriented outcomes and meanings of scientific and technological advancement; the ethics of any type of technologized governance presenting itself as the most important and enduring concern. There is a huge democratic stake in the ethical governance, in itself, and in the success of ethically and democratically managing this novel technological revolution with high promises and only partially assessed potential threats for individual and mankind future. Researchers in political science, philosophy of technology and STS are called to set the agenda of discussion and argue for beneficial priorities in this ample developmental project of humanity that cannot be entirely left to be set by the technological companies.

Keywords: Power, technology, democracy, social epistemology, Science and Technology Studies

THE OLIVE PRODUCTION IN THE MEDITERRANEAN REGION, FROM 1940S TO 1970S

Elife Biçer-Deveci

Geneva Graduate Institute

elifebicer@gmail.com

This paper examines the development of olive production in the Mediterranean during the 1940s and 1970s, a period marked globally by the intensive use of agrochemicals. Postwar enthusiasm for synthetic pesticides and fertilisers also shaped the olive sector, which the Food and Agriculture Organization (FAO) identified as central to the region's economy alongside crops such as tobacco, grains, and cotton. As part of its broader development aid agenda, the FAO launched a specialised programme to modernise Mediterranean olive cultivation. This programme combined expert missions, field surveys, and farmer training, but it relied primarily on the promotion and refinement of chemical pest control as the key to increasing yields and improving oil quality.

The progression of this programme was continually evaluated within an FAO expert group dedicated to olive production and pest management. This expert group consisted of experts and delegates from countries of the region, for instance, Greece, Italy, Spain, Israel, Algeria, etc. Through an analysis of the group's publications, meeting reports, and technical correspondence, the paper traces how scientific knowledge and emerging technologies shaped the organisation's strategies as well as practices on the ground. It highlights the dominant postwar belief in agrochemical modernisation, the technical challenges posed by the olive pests, and the ways in which entomological research guided FAO policies. At the same time, the paper explores the gradual rise of ecological concerns during the 1960s, as evidence accumulated regarding pesticide residues and environmental disruption. These debates opened space for experimentation with alternative approaches, including irradiation techniques and biological control initiatives.

By reconstructing these discussions, the paper shows how the interplay between scientific expertise, technological innovation, and shifting environmental awareness reshaped the FAO's olive programme. It argues that this period marks a significant transition—from a model of agricultural modernisation rooted in chemical solutions to a more diversified and ecologically informed understanding of pest management in Mediterranean olive cultivation.

Keywords: agrochemicals, entomology, international development, Mediterranean, agriculture

THE PRODUCTION OF SCIENTIFIC KNOWLEDGE AMID VIOLENCE: THE CASES OF FREDERICO WELWITSCH'S EXPEDITIONS IN PORTUGAL AND ANGOLA

Sara Albuquerque

University of Évora, IHC, IN2PAST, Portugal

sma@uevora.pt

This presentation examines Frederico Welwitsch's (1806–1872) expeditions carried out in Portugal (1839–1853) and Angola (1853–1860), highlighting the production of scientific knowledge—particularly material culture (natural history collections such as a herbarium, carpological collections, ethnographic objects, etc.)—in climates of tension and violence, and questioning whether the expedition itself is also an act of violence. Various forms of violence are thus portrayed: that of the violent contexts in which the expeditions took place, as well as science as a form of violence—the imposition of an external model.

It is known that, on his expeditions, Welwitsch was accompanied by other naturalists interested in botany and by explorers such as Robert Brown (1773–1858), David Livingstone (1813–1873), the Count of Escayrac de Lauture, and Bento António Alves (c. 1796–1878), in different periods and locations. However, there were also invisible actors who were part of these expeditions and colonial encounters, namely porters from local communities, the Queen of Ambrizette, Francisco António Flores, and Francisco de Sales Ferreira (c. 1820–1857), to mention only a few.

The work is funded by national funds through FCT – Fundação para a Ciência e Tecnologia, I.P., in the framework of the UID/04209/2025 e LA/P/0132/2020 (doi.org/10.54499/LA/P/0132/2020) and KNOW.AFRICA (ref. 2022.01599.PTDC) | <https://doi.org/10.54499/2022.01599.PTDC>.

Keywords: Field practices, History of Science, Collections of Natural History

THE RECONSTRUCTION OF ASTRONOMICAL KNOWLEDGE AND INSTITUTION IN EARLY SONG DYNASTY

Zhihan Li¹, Jingjia Qiu²

¹ School of History, Renmin University of China, Beijing, China.

² Department of History, Sun Yat-sen University, Guangzhou, China.

lizhihan2021201050@ruc.edu.cn

The Tang (618–907) and Song (960–1279) dynasties considered pinnacles of ancient Chinese astronomy. However, the An-Shi Rebellion (755–763) during the mid-Tang precipitated unprecedented societal destruction, severely disrupting state-sponsored astronomical activities. Although the imperial observatories continued publishing new calendars, they were no longer able to cast large-scale instruments such as armillary spheres and systematic stellar observation came to a halt. Consequently, although the Tang and Song dynasties are generally regarded as consecutive in political history, a long-term and profound rupture existed between their astronomical knowledge traditions.

In the early Song, the astronomer Han Xianfu played a key role in bridging this gap. By systematically reviewing earlier texts, he built two armillary spheres, which promoted the post-war renewal of Song astronomy and the reconstruction of its knowledge system. Han completed his first armillary sphere in 995, which was installed in the observatory outside the imperial palace. His second sphere, completed in 1010, was placed within the palace. These two instruments employed the two-layer and three-layer armillary sphere structures respectively. The main difference was that the three-layer model had a separate ring for the celestial equator in the middle layer. Through comparative practice, Han found the three-layer model was more flexible and allowed a wider view of the sky, so it became the standard for future armillary sphere construction. Furthermore, by restoring observational condition, Han's work let Song calendrical science back toward scientific observations.

In addition to regrouping earlier astronomical knowledge, the court implemented impactful administrative adjustments in the early Song. While retaining the Tang's Directorate of Astronomy and Calendar(司天监), the Song established the Hanlin Astronomical Institute(翰林天文院) as a parallel office. This dual system reflected the Song's characteristic separation of powers: the two bodies conducted observations independently, with the Directorate responsible for calendar formulation and the Hanlin Institute for adjustment. The physical separation of Han's two instruments—one inside and one outside the palace—was a deliberate arrangement to prevent collusion among astronomers, thereby ensuring the independence and integrity of astronomical observation and calculation.

Keywords: Ancient China, Early Song, Astronomy Knowledge, Reestablishment, Separation of Powers, Han Xianfu

TOY ROBOTS: PLAYING WITH TECHNOSCIENCE

Artemis Yagou

Deutsches Museum (Munich)

artemis@yagou.gr

From ancient steam-powered automata to the sixteenth century mechanical monk, from the Japanese tinplate humanoid Lilliput of the late 1930s to Lego Mindstorms from the turn of the millennium, there has been a great variety of robot-like creations that incorporated a strong element of playfulness. In the 1950s and 1960s in particular, a large number of anthropomorphic toy robots emerged, with names like Robert the Robot and Television Spaceman. Such toy robots became part of the everyday and helped shape expectations of technology and science, at a time when industrialised societies were concerned with automation and the resulting potential for mass unemployment. According to one hypothesis, the miniature, anthropomorphic designs served as a way to pacify the widespread concerns and fears of dehumanisation by technology. By providing children with the low-risk activity of handling toy robots, adults could creatively cope with their anxieties about the technoscientific future and get accustomed to the changes to come. In this presentation, my aim is to outline and investigate the uses and meanings of toy robots. Issues to be discussed include toy robots' periodisation, typologies, and international variants, with the ultimate goal to explore how toy robots reflected the technoscientific development of their times and how such toys affected the public perception of technology and science.

Keywords: robots, play, technology, science, emotions

TRANSMISSION OF ARTISANAL KNOWLEDGE BETWEEN MINING COMMUNITIES: BETWEEN TRADITION AND PROFESSION.

Martha Ortega Soto¹, Tadeo Hamed Liceaga Carrasco²

¹ *Philosophy Department Metropolitan, Autonomous University, Campus Iztapalapa, Mexico*

² *Politics and Culture Department, Metropolitan Autonomous University, Campus Xochimilco, Mexico.*

mortega@izt.uam.mx

This presentation aims to expose how the knowledge and skills of artisanal mining are transmitted. Artisanal mining and small-scale mining refer to extractive mining companies that exploit small deposits located in hard-to-reach areas, typically within agricultural communities. In addition, artisanal mining commonly operates under informal conditions and outside the regulatory framework. Workpeople lack academic degrees that qualify them as mining engineers, geologists, or surveyors; they work by applying inherited knowledge from their parents and grandparents, who, at the same time, gain experience on the job from their elders.

These artisanal and small-scale miners do their job with basic tools and equipment, considering this type of mining to be highly vulnerable. They had health problems that they had to afford on their own. As they didn't have the advocacy of important capital investment, the metal extraction was limited, so it was difficult to obtain competitive prices, and, in many cases, they lived through a subsistence economy. However, there existed artisanal mining communities and gold seekers (gambusinos in Spanish) who tried to defend their rights against large mining consortia and local and federal governments, although their success was limited.

The application of their knowledge starts with the detection of deposits and materials of interest for miners. Subsequently, they realize exploitation based on learned technology, which also constitutes a historical heritage to artisanal miners, in some cases, with a historical tradition that goes back to the 19th century or earlier. It's important to accentuate that this technology changes based on their practical experience and the geographical and environmental conditions of each place. So many times, depending on the type of metal, artisanal miners should extract the element that they are searching for in the mineralization; in that case, they also employ traditional methods. In other cases, they commercialize the mineral as they extract it.

For this reason, it became relevant to study the historical technological development in artisanal mining communities, because noticed that evolution would show the social problems faced by those who participate in these communities.

Keywords: Artesanal mining, Artesanal knowledge, mining communities, gold seekers (gambusinos in Spanish), Mexico

UNDERSTANDING TECHNOLOGY INNOVATION: MECHANIZATION AND ENVIRONMENTAL IMPACTS

Maria da Luz Sampaio¹, João Reynolds²

¹ CIDEHUS - University of Evora - Portugal

² Pirra enterprise

mluzsampaio@gmail.com

Understanding technological innovation and its applications has required an awareness of the interplay between know-how, capital, and public policies. This interplay has been visible through local studies and various micro-studies that can contribute to obtaining a “big picture” of the transition from manual work to mechanization in areas such as agro-industry and large-scale forestry. On the other hand, the history of technologies leads us to associate the introduction of new energy sources, scientific progress, and, more recently, environmental concerns.

In Portugal, in the Alentejo region, the studies of Guimarães (2004, 2016) and Matos (1991, 2003) show us how industrial initiatives were centered on sectors such as textiles, especially woolens, cork, leather tanning, and cereal milling—sectors in which large landowners and capital combined to leverage new industrial projects that achieved particular prominence in the 1920s and 1930s. In the Alentejo region, cities such as Évora, Portalegre, Estremoz, and Beja present relevant cases in the industrialization process. Our analysis focuses on a case study in Estremoz, beginning with João Trindade Pirra, a blacksmith by profession, who in 1928 owned a workshop dedicated to the manufacture of agricultural tools and small agricultural implements, and from 1932 began producing the first machine tools for iron and wood.

Almost a century later, maintaining its connection to the agricultural and industrial sectors, the company currently ensures the metalworking production of equipment developed by Reynolds, a company responsible for the design and engineering of technical solutions for the agricultural and forestry sectors.

This text presents the Reynolds forest planter, equipment fully developed to address persistent limitations of manual planting and conventional mechanized solutions, in a context marked by increasingly shorter planting windows, labor shortages, and growing demands for productivity and planting quality. The equipment was designed to operate only at the point of plant insertion, minimizing soil disturbance, which allows it to function on sloped, irregular, stony, or debris-covered terrain, significantly expanding the conditions under which it can be used and gives the opportunity to improve florestation process

Keywords: technology, innovation, agro industrial sector, planting machinery

WHO DEFINES THE “REVOLUTION”? SOCIAL CONSTRUCTION, PERIODIZATION, AND CONTEMPORARY TECHNOLOGICAL HIERARCHIES

Simone Fari

Universidad de Granada

fari@ugr.es

This paper examines a question often assumed rather than analysed: who defines which technologies count as “revolutionary” in the current technological transformation, and with what epistemological legitimacy? Instead of starting from a fixed list (AI, robotics, blockchain, quantum computing, etc.), the paper investigates how such lists are produced, stabilised, and circulated across institutions shaping investment priorities, policy agendas, and public expectations.

The paper develops the next stage of a wider economic-historical project on the current technological revolution. It builds on earlier work that questioned the adequacy of labels such as “Industry 4.0” and “Fourth Industrial Revolution,” and proposed a more historically grounded framework. Here, the focus shifts from naming the era to tracing the actors and arenas through which technological hierarchies are constructed.

Methodologically, the study uses a macro-qualitative and iterative research spiral combining three lenses: General Purpose Technologies and Technological Paradigms, the Social Construction of Technology, and National Systems of Innovation. The empirical core compares scholarly literature with grey literature produced by international organisations, consultancies, and policy-oriented institutions.

The paper also raises a historical and epistemological issue. The first and second industrial revolutions were periodisations largely elaborated by scholars and historians. By contrast, the so-called third industrial revolution has remained more conceptually contested, with less stable empirical and historiographical grounding. In the case of the “fourth,” the initial impulse came not from historians but from policy and business actors, such as the World Economic Forum and the German Industry 4.0 initiative. These were originally brands and strategic narratives rather than historical definitions. Only later were they appropriated by scholars, triggering a second process of social construction around the technologies presumed to sustain them.

I argue that defining a revolution is itself part of the historical process historians of technology should explain, but also a task requiring caution when it implies periodisation. Making these classificatory struggles explicit not only clarifies contemporary technology debates but also reopens the question of the role of historians in naming, legitimising, and historicising technological change.

Keywords: Economic History, technological revolutions, social construction of technology, periodization, grey literature

**SPECIAL FOCUS: MUSEUMS, MATERIAL AND INTANGIBLE CULTURAL
HERITAGE, AND PUBLIC ENGAGEMENT**

A CENTURY OF HISTORY OF PRINTING TECHNOLOGY IN GREECE THROUGH THE ARCHIVE AND COLLECTIONS OF THE ASPIOTIS-ELKA GRAPHIC ARTS SA, HELD BY THE HISTORICAL ARCHIVE OF THE NATIONAL BANK OF GREECE.

Chrysalena Antonopoulou

Historical Archive of the National Bank of Greece, NBG, Athens, Greece.

antonopoulou.chris@nbg.gr

Founded in 1928, as the result of the merger of two major printing companies, Aspiotis-ELKA Graphic Arts SA played a prominent role in the development of typographic practices and graphic arts in Greece during the 20th century. Its history begins in Corfu, in 1873 where members of the Aspiotis family established a playing card manufacturing company under the name “Elpis” (“Hope”), which soon evolved into a pioneering factory engaged in the production of a wide range of printing products. Throughout its history the company consistently observed and adopted the technological achievements of the time, importing cutting-edge typographic machinery, investing in research, experimentation and specialized training of highly skilled technicians and developing its printing and image reproduction methods, entering new fields such as security printing and art publications.

Today, the company’s archive and collections of final products and printing essays, along with its photographic archive, printing and other machinery and technical equipment are preserved by the Historical Archives of the National Bank of Greece. In this paper, the historical value of the documents and the various types of archival material found among the above (including lithographic stones, glass plates, zinc plates, curved metal printing plates and transparency films) will be presented and issues related to the preservation and management of the collection will be discussed. In addition, insights from the recent example of the collection's participation in an exhibition co-organized with the Benaki Museum (presented at the Benaki Museum from October 2025 until January 2026) will be shared to address issues of exhibition approaches regarding the history of technology.

Keywords: printing technology, graphic arts, 20th century, Greece, Aspiotis ELKA Graphic Arts SA, Historical Archive of the National Bank of Greece

COLLECTING FOR COMPARATIVE TECHNOLOGY. THE JANKOVIC COLLECTION OF ETHNOGRAPHIC OBJECTS AT THE MUSÉE DE L'HOMME

Juliette Ronsin

Mucem—École des hautes études en sciences sociales, Marseille-Paris, France

juliette.ronsin1@gmail.com

This paper draws on research conducted within my current postdoctoral project at the Museum of European and Mediterranean Civilisations (Mucem) in partnership with the EHESS (France).

The project is based on the study of the collection assembled by Colette Jankovic (1898–1981) and Dušan Jankovic (1894–1950), an artist and ethnologist couple who were responsible for the acquisition by the Musée de l'Homme, between 1947 and 1981, of nearly six thousand objects, mainly originating from Yugoslavia.

Colette Jankovic was trained by André Leroi-Gourhan, founder of the Department of Comparative Technology at the Musée de l'Homme, and later worked closely with Monique Roussel de Fontanès, who co-directed the department. Her aim was to build a collection representative of the “traditional culture of the South Slavs,” intended to complement Leroi-Gourhan’s work, particularly his research on Greece for the European fund of the Musée de l'Homme. The Jankovic collection includes objects dating from the mid-nineteenth to the mid-twentieth century. Today dispersed across several institutions—the Mucem, the National Museum of Natural History, and the musée du quai Branly—it comprises items related to clothing, domestic and agricultural life, art and craftsmanship, as well as festivals and religious practices. The collection was assembled through a network of local intermediaries operating in Yugoslavia.

The trajectories of Colette and Dušan Jankovic span three successive political regimes, situating the collection within East–West circulations shaped by the post-war context and the Cold War. Using this case study, the presentation examines the meaning of this museum collection: how does it relate to the institutionalisation of a specialised field of research on the Yugoslav space, and more broadly on the Balkans? In what ways does it contribute to the project of comparative technology as it developed at the Musée de l'Homme? Finally, what representation of the “traditional culture of the South Slavs” is constructed, at a time when Yugoslav society was undergoing unprecedented social and economic transformations in the 1950s?

Keywords: Circulation, Museum, Yugoslavia, Technology, Ethnology

CREEPING INTO THE CONTEMPORARY: MATERIAL SOURCES, PLACES AND EXHIBITIONS OF SALT HISTORY IN NUCLEAR REPOSITORY SITING

Alexander Kolibaba

Department of Geosciences, University of Fribourg, Switzerland

alexander.kolibaba@unifr.ch

In the 1950s, geoscientists concluded that salt was a suitable host rock for nuclear waste disposal in the deep underground. Subsequently, the first nuclear repositories were constructed in salt mines in both German states as early as the 1960s. Salt's industrial history, natural analogues and the material properties identified by geoscientists – salt rock creeps, it encloses and is considered impermeable – raised expectations that a solution to the increasing waste problem of nuclear power production was found. However, large protests against new repository projects, significant incidents at existing sites and critical statements from experts impacted nuclear disposal in salt heavily in subsequent decades. Nuclear waste repositories and salt geology became increasingly associated with political and scientific controversies, high risks and failures, setting back Germany's plans for nuclear waste repositories. Following Germany's nuclear phase-out since the 2000's, a new site selection process for a high-level radioactive waste repository in Germany was launched. This suggests a fresh start with an open outcome, using a 'white map' approach that detaches the current siting campaign from its controversial salt history.

However, salt remains present as one of three investigated host rocks in today's selection process and its political, techno-scientific and material histories continue to have impact. In my doctoral research, that combines contemporary history and human geography, I examine the political geology of salt in its historical and present dimensions. Guided by multi-source approaches, I analyse documents, conduct interviews with experts and contemporary witnesses with geo-scientific and activist backgrounds and investigate the meaning of spaces, exhibitions and materials. This allows to understand various aspects of salt geology's history as it is preserved, narrated, used and understood by various actors in the repository siting process: E.g. the role of Germany's failed and vanishing repositories in current salt knowledge production, the investigation and archiving of historical salt drill cores and documents as scientific and political evidence and how and why archives, museums and exhibitions preserve and produce host rock history. This research contributes to the understanding of history in nuclear disposal and aims to provide new insights into the importance of material sources for historical studies.

Keywords: Environmental History, Geography, Geology, Nuclear Waste Disposal, Salt, Archives, Museums

FROM NATION BUILDING TO CAMPUS SPIRIT: THE ROLE OF POLYTECHNIC MUSEUM AND MUSEUM OF STUDENT LIFE IN ENGAGING TECHNOLOGY STUDENTS TO HISTORY OF PROFESSION AND CULTURAL HERITAGE FROM 1958 TO 2021

Ahto Harmo

Museum of Student Life, Espoo, Finland

ahto.harmo@ayy.fi

In my presentation I explore how Polytechnic Museum's (PM) role in engaging technology students to history of their professions and cultural heritage changed from 1958 to 2021 when it was renamed as Museum of Student Life. The founding era from the late 1950s to the end of the 1960s coincides with the ideological shift from nation building in Finland to the rise of antiestablishment movements such as student activism of the late 1960s. In student culture old traditions gave way for new ideas. A museum of objects guided with then old-fashioned esprit de corps was not equipped to face the challenge of a more informal and less hierarchical community spirit of the emerging 1970s.

The relocation of Helsinki University of Technology to Otaniemi campus (Espoo) in 1966 distanced the Helsinki city-based museum from everyday student life. Efforts to relocate PM failed. During the 1970s and 1980s museum activities were mostly discontinued. PM reopened at a permanent location in Otaniemi in 1992. Its focus shifted more to student activities than history of profession. As the previous museum space, the new museum was refurbished in cellar space by volunteers with do it yourself spirit commonly associated with technology students in Finland. The exhibitions were curated to strengthen the identity of technology students.

In early 2000s PM started to focus also on the history of technology, particularly in exhibiting teaching and study tools. This coincides with the professionalisation of the museum curation. The focus shifted after a few years with changes in personnel. Thereafter PM's role became more to foster technology student culture, preferring its more traditional forms.

The technology student union merged with both economics and arts student unions in the formation of multidisciplinary Aalto University in 2010. PM kept its name and was viewed as a stronghold of technology student culture. After a renovation, and more than ten years of more diverse campus and student life, in 2021 the renamed museum opened noticeably to represent also other student cultures. Therefore, the role of Museum of Student Life has shifted towards building campus spirit amongst technology, economics, and arts students.

Keywords: museums, technology students, community engagement, university history

GENDER AS AN ANALYTICAL TOOL FOR TECHNICAL COLLECTIONS. RETHINKING MATERIAL CULTURE IN THE HISTORY OF TECHNOLOGY

Sophie Gerber

Technisches Museum Wien, Vienna, Austria

sophie.gerber@tmw.at

This talk will show how gender can serve as a key analytical category for understanding technical objects and enrich the historical narratives through which technology is interpreted. It will be demonstrated how objects from the collections of the Technisches Museum Wien (Vienna Museum of Science and Technology) provide an empirical basis for exploring the entanglements of gender, everyday life, and technological practice. Artefacts of material culture—such as razors, tools or pianos—are shaped not only by functional or engineering logics but also by gendered norms, expectations, and assumptions embedded in their design, use, and representation. Objects are treated not only as traces of technological development but as sites where social relations, identities, and power structures become materially visible.

The talk will also demonstrate how gender-informed methodologies can transform museum practice. Technical museum collections, often considered neutral repositories, actively participate in constructing and perpetuating gendered narratives. Integrating gender as an ongoing analytical lens in collecting, exhibiting and educating challenges traditional narratives that privilege male-centered innovation stories and marginalize other perspectives. This contributes to more inclusive and critically reflective museum environments—an increasingly urgent task in a global context where museums seek to address issues of diversity, representation, and public engagement.

By presenting methodological reflections alongside concrete object analyses, the talk will invite historians of technology and museum professionals to reconsider the role of material culture in shaping not just what we know about technology, but how we come to know it.

Keywords: Gender, Technology, Museums, Collections, Exhibitions, Everyday Life, Artefacts

HERITAGE PROTECTION OF A RAILWAY-ASSOCIATED TECHNOLOGY: AN ANALYSIS OF THE CASE OF THE PARANAPIACABA FUNICULAR SYSTEM (BRAZIL)

Milena Meira da Silva

Department of Geography, Institute of Geosciences (IG), State University of Campinas (UNICAMP), Campinas, Brazil.

milenameiras@gmail.com

The protection granted to industrial heritage sites reveals a valuation of their architectural aspects, to the detriment of the technological aspects that define and express their essence. This marks the persistence of an Authorized Heritage Discourse (Smith, 2006) in preservation practices. The Nizhny Tagil Charter (2003) establishes that the perceptible values in this type of heritage include historical, technological, social, architectural, or scientific aspects. Among these, the technological and scientific aspects are decisive in differentiating them from other heritage sites. Among the world heritage sites protected by UNESCO, a minority are of the industrial type (Falser, 2001). In this context, actions aimed at protecting the technological elements linked to industrial heritage represent a potential avenue for working from alternative perspectives, beyond the heritage value frameworks commonly attributed to cultural assets. Therefore, this paper aims to highlight the discussions surrounding the protection of the Paranapiacaba Funicular System (Sistema Funicular de Paranapiacaba), associated with the first railway in the State of São Paulo (Brazil), built to overcome an elevation drop of over 800 meters — a defining feature of the railway's construction within a natural heritage setting. The intention is to point out the main justifications, value attributions, and other motivations that generated its protection, through an analysis of the legal process of the protection attributed to the Paranapiacaba Funicular System, decreed by the Council for the Defense of Historical, Archaeological, Artistic and Tourist Heritage (Condephaat). It is the agency responsible for the preservation of the cultural heritage of the State of São Paulo, and the most representative in the preservation of railway heritage in Brazil. The main results indicate that the interest in preserving this cultural asset stemmed primarily from specialists in this technology, motivated by concerns over its preservation, given its advanced state of degradation and in the face of threats of its replacement by new technologies, in response to market demands. In conclusion, the analysis reveals that jurisdictional problems hinder efforts to preserve the funicular system, coupled with complexities in management and refunctionalization, given its vast extent and advanced state of degradation, which demands broader conservation strategies.

Keywords: Industrial heritage, Preservation, Funicular System, Protection, Valuation

HISTORY THROUGH EXPLORATION: PERIPHERY PASSIVE ENGAGEMENT IN HISTORICAL VIDEO GAMES

Tyler Gillis

Texts and Technology PhD Program, The University of Central Florida

tyler.gillis@ucf.edu

This paper examines how contemporary historical video games function as legitimate historical discourse through a framework the author terms "Periphery Passive Engagement." Drawing upon Robert Rosenstone's work on historical film and Adam Chapman's analysis of digital games as history, the paper extends Jean Lave and Etienne Wenger's concept of Legitimate Peripheral Participation into the domain of historical learning. The central argument holds that players acquire substantive historical knowledge through environmental and architectural interaction with virtual reconstructions, even when they bypass narrative elements such as cutscenes and dialogue. Because open-world realist simulations cannot compel players to engage with scripted content, the historically informed environment itself becomes the primary vehicle for historical communication.

This argument carries weight given the medium's scale. The video game industry generates roughly \$200 billion annually and reaches 3.6 billion players globally, exceeding the combined revenues of film and music by a factor of three. Individual historical titles routinely sell tens of millions of copies, reaching audiences orders of magnitude larger than the most prolific classroom historian could engage across an entire career. Historians who decline to engage with this medium effectively cede authority over historical interpretation to commercial interests with no scholarly accountability.

To demonstrate the framework's utility, the paper analyzes Ubisoft's *Assassin's Creed Odyssey* (2018). Three case studies illustrate how environmental design encodes current scholarship: the recreation of the Odeon of Pericles, modeled on the tent of Xerxes; the deliberate use of polychromatic statuary drawn from the "Gods in Color" exhibition tradition; and the topographically faithful rendering of the Sanctuary of Apollo at Delphi. In each case, developers working alongside historians and archaeologists have embedded peer-reviewed scholarship within environments players traverse passively while pursuing other objectives, opening new avenues for scholar–developer collaboration.

Keywords: Video Games, Historical Learning, Periphery Passive Engagement, *Assassin's Creed*, Visual Historiography, Digital Humanities, Historical Representation, Reenactment

PRESERVING THE UNPRESERVABLE: A FRAMEWORK FOR LARGE SCALE ARCHIVAL CONSERVATION OF TECHNICAL CONSTRUCTIONS

Jørgen Burchardt

Middelfart Museum

jorgen.burchardt@mail.dk

Contemporary technological heritage expands at a pace that far exceeds the collecting capacity of museums. Product lines proliferate, industrial facilities are too extensive and interdependent to preserve physically, and design cycles accelerate across both hardware and software. When firms close, restructure or migrate to new digital platforms, the evidential traces of design decisions, production constraints and organisational practices often disappear before heritage institutions can intervene. Existing research in digital preservation and records management has focused primarily on public-sector archives or bit level integrity; far less attention has been given to born digital technical records in private enterprises. This project argues that large scale preservation of business archives can provide a scalable complement to object centred collecting.

Using Denmark as a critical case—once home to the state run Erhvervsarkivet (1948–2014), which achieved unusually broad coverage of paper based business archives—the project examines how comparable representativeness might be rebuilt under conditions of cloud storage, platform fragmentation and globalised supply chains. Preservation is conceptualised not as file retention but as sustaining contextual intelligibility: provenance, metadata, dependencies and functional relationships. A CAD model without libraries or change history is as silent as an undimensioned drawing; an ERP extract without data dictionaries or system documentation loses explanatory power.

Methodologically, the study combines case studies, interviews and technical analyses of corporate information environments, including CAD/PDM, ERP, project management systems, email and chat, shared drives and cloud services. It develops a framework for large scale selective capture, integrating appraisal, risk assessment and access design through tiered preservation targets: bit level fixity, structured provenance and system mapping, contextual workflow documentation, functional access strategies and curated dissemination packages for research and exhibition.

The project also addresses governance and ethics—intellectual property, trade secrets, GDPR, embargo periods and differentiated access regimes. Because enterprise systems and technical formats are globally standardised and corporate operations transnational, the study evaluates options for international coordination, including shared format registries, preservation coalitions and cross border guidance aligned with documentary heritage principles, with UNESCO's Memory of the World as a potential model.

Keywords: museum, archive, digital archive, technical construction, business history, business archive

SCIENCE MUSEUMS AND THE SCIENTIFIC IDENTITY OF SHANGHAI

Katarzyna Jarosz

Vizja University

katarzynojarosz@gmail.com

This paper analyses how museums of science and technology in Shanghai construct a public representation of science and how this representation contributes to the city's scientific identity.

The analysis is organised along two axes. The first is disciplinary, covering medicine, engineering and transport, and water-related sciences. The second is temporal, tracing how exhibitions position scientific knowledge as ancient and continuous, early modern, socialist, or contemporary, and whether scientific achievements are presented as local to Shanghai or detached from place.

Medicine is examined through the Shanghai Museum of Traditional Chinese Medicine and the functioning Tong Tianhe pharmacy in Zhujiajiao. These sites present medical knowledge through artefacts, manuscripts, prescription records, herbal specimens, and working spatial arrangements. They foreground haipai zhongyi as a Shanghai-based tradition shaped by urban practice and reform in the late nineteenth and early twentieth centuries, with figures such as Yun Tieqiao represented through original documents. In contrast, the Shanghai Science and Technology Museum presents health and biology through interactive measurement devices, anatomical models, and simplified displays of biotechnology, such as cloned plants and taxidermied animals. The city's active biomedical research institutions remain largely absent from this narrative.

Engineering and transport are analysed through the Shanghai Railway Museum, Shanghai Maglev Museum, and Shanghai Metro Museum. Together, these institutions construct a chronological sequence from early railways to high-speed levitation and automated metro systems. Exhibits include locomotives, reconstructed carriages, exposed technical components, simulators, signalling models, and data-driven visualisations of network management. Transport infrastructure is presented as a system of coordination, safety, and control embedded in everyday urban life.

Water-related sciences are examined through the Shanghai Yuan Dynasty Water Gate Site Museum, Dongtan Wetland Park's ecological exhibition hall, and the China Maritime Museum. These institutions link medieval hydraulic engineering, contemporary hydrological monitoring, and maritime technology to the city's deltaic environment and port economy. Water appears as infrastructure, ecological system, and medium of exchange.

Keywords: shanghai, science museum, city identity, technology

THE "PASTALI" FARMHOUSE IN XANTHI: FROM HISTORICAL TOBACCO CULTIVATION TO A HYBRID MODEL OF ADAPTIVE REUSE

Maria Petra

PASTALI. NPO (formal institutional member of TICCIH International)

petra.maraki@gmail.com

This paper highlights the historical and productive significance of the "Pastali" farmhouse in Palia Chrysa (formerly Kiretsiler), Xanthi. Since 1928, when Marco Nestoroff published his seminal work *Les tabacs d'Orient*, this region has been internationally recognized as the production center of the world's finest tobacco, the Basma variety. The 113-year-old estate serves as a quintessential specimen of a pre-industrial site, architecturally structured around the "tobacco triad": the farmhouse (residence), the "santzaki" (open-air processing and drying unit), and the tobacco field.

The study explores the pivotal role of tobacco cultivation in shaping the socio-economic and architectural physiognomy of the settlement. Concurrently, it analyzes a sustainable adaptive reuse proposal for the complex. The "Pastali" estate is envisioned as a model "hospitality station" for researchers, students, and the public, bridging the field of industrial archaeology with contemporary production.

"A central pillar of this initiative is the work of PASTALI NPO, which operates under the auspices of the Hellenic Ministry of Culture and is a formal institutional member of TICCIH International (The International Committee for the Conservation of the Industrial Heritage). This institutional framework ensures that the project aligns with international standards for the study and preservation of industrial landscapes."

The project aims to preserve Greek productive culture while revitalizing the cooperative ideal, as established in the region by pioneer Alexandros Baltatzis. Through educational programs, artistic events, and the implementation of permaculture principles, the initiative fosters a meaningful connection between the productive past and the present.

The study concludes that "resurrecting" industrial spaces, memories, and figures provides the necessary social ballast for the stability and sustainable development of modern rural communities. Ultimately, the study of our productive past serves a fundamental and essential purpose: the reclamation of our productive consciousness. In this context, knowledge constitutes power only when it is decisively transformed into action and practical application.

Keywords: Xanthi, Basma tobacco, Station of Industrial Archaeology, adaptive reuse, industrial tourism, cooperative education, TICCIH.

**THE HISTORY OF TECHNOLOGY BETWEEN THE LOCAL, THE
REGIONAL, AND THE GLOBAL**

ASSEMBLY LINES & SKDS IN LOCAL SETTINGS: EXPORTING ROMANIAN TRACTORS DURING IN 1970S

Corina Dobos

National Institute for the Study of Totalitarianism, Romanian Academy, Bucharest, Romania

cori.dobos@gmail.com

During the 1970s and 1980s, tractors produced by Uzina Tractorul Braşov (UTB) a tractor-factory situated in the Socialist Republic of Romania became global commodities known around the world, in places like Australia, Peru, or Egypt. Starting with the 1970s, UTB started producing for foreign markets, with as much as 80% of its production being exported in the 1970s. Its tractors were sold all over the world: in Australia, Egypt, Peru, or Turkey, under different names: Universal Farmliner, Titan, Universal, UTB, Agripak, Hattat Universal Tractors.

As the production gradually became export oriented, UTB had to adapt to the challenges of the global market and to find solutions to improve its export related costs. Thus, in the 1970s UTB began to promote the SKD-tractors exports, that is the export of semi-knocked down (SKD) kits of tractors, when a tractor is partially disassembled into larger modules before being shipped to the destination country for final assembly. This mode of transportation ensured trade benefits, better packaging & reduced damages, higher per cubic utilization of packaging & containers and reduction in packaging cost.

My presentation explores the UTB SKD-export process in Zimbabwe at the beginning of the 1980s, focusing on the assistance provided by the Romanian experts (engineers and managers) to the construction of assembly lines in Zimbabwe. The files from UTB archive document this process carefully, retaining exchanges between Romanian engineers and locals, locally designed solutions, and precious evaluation reports from both the Romanian and Zimbabwean experts upon the entire process of assembly lines building. In addition to the investigation of technology, know-how transfers and of trade connections, I closely explore the “human side” of the process, focusing on the between multilayered exchanges between Romanian and Zimbabwean experts, to explore differences in local cultures of expertise and culturally mediated mutual perceptions produced in these new spaces of global encounters. In the quest to decipher local actors’ voices, my research will use oral history interviews taken to various Romanian engineers and managers involved in export-related activities active UTB in the 1970s and 1980s, in addition to archival documents.

Keywords: tractor, expertise, export, SKD, assembly line, Romania, Zimbabwe

CRAFTING LIGHT: A HISTORICAL PERSPECTIVE ON REFLECTING TELESCOPES IN THE SPECULUM ERA

Mauro Gargano, Pietro Schipani

National Institute for Astrophysics, Astronomical Observatory of Capodimonte, Naples, Italy

mauro.gargano@inaf.it

The development of reflecting telescopes during the speculum era offers a revealing perspective on the interplay between scientific ambition and engineering ingenuity. Conceived in the late seventeenth century as a response to chromatic aberration in refractors, mirror-based instruments demanded increasingly sophisticated optical configurations at a time when the fabrication of metallic mirrors posed severe material and technological constraints. As reflectors expanded in aperture and mass, mechanical issues: structural rigidity, stability, and motion control, became central engineering challenges, prompting the invention of new mounting systems and support solutions.

This contribution examines the evolution of reflecting telescopes from the speculum era onward, emphasizing how each technological step reshaped both the possibilities and the limits of astronomical observation.

Keywords: Reflecting Telescopes, Speculum

EARTH STATIONS FOR SALE: SATELLITES AND THE POSTCOLONIAL ORDER OF LONG-DISTANCE TELECOMMUNICATIONS

Alex J. V. Hall

Max Planck Institute for the History of Science

ahall@mpiwg-berlin.mpg.de

Histories of the so-called “Space Age” are now paying closer attention to the terrestrial infrastructures on which satellites and spaceflight have always depended. Yet, the intercontinental proliferation of “earth stations” for satellite communications from the 1960s is usually explained through Cold War technopolitics, with different national stations being courted for competing US-led and Soviet-led satellite systems. This paper argues that, in many parts of the world, the shaping of earth station projects had little to do with the “Cold War” or the “Space Age,” and, instead, reflected localised infrastructural concerns and a complex transnational web of export interests. Focusing on the network of earth stations operated by British Treasury-owned company, Cable & Wireless, it analyses the contentious role of these new infrastructures in reshaping colonial networks of long-distance telecommunications. Satellites would provide another form of radio infrastructure, and Cable & Wireless had played a dominant role in this market across the British Empire. The company’s pursuit of earth stations, however, coincided with the renegotiation of its role alongside the emerging telecoms administrations of newly independent nations.

In the places where they were situated, these earth stations had broad regional political implications and often much wider economic entanglements: siting one in Jamaica (1971), for example, would impact the overall technopolitical dynamics of the Caribbean, following the failure to establish a unified West Indies state; Meanwhile, the 1967 Hong Kong earth station caused a diplomatic dispute between the UK and Japan, as the British government sought to use Cable & Wireless’s position to give British industry a foothold in this competitive new export market. To better understand the early history of satellite communications, therefore, we should not look at these systems as satellite technology supported by terrestrial networks, but as terrestrial (and mostly coastal) infrastructure supported by a handful of satellites. Doing so helps us to move these histories beyond archetypal Cold War narratives. Focusing on this broader web of contractors and new national bureaucracies, meanwhile, opens up a more diverse range of actors than traditional space age histories allow.

Keywords: Satellites, Space Age, Empire, Postcolonial Infrastructure, Telecommunications, International Trade

FROM CYBERNETICS TO CYBER-PHYSICAL PRODUCTION: A CRITICAL GENEALOGY OF THE DIGITAL TWIN AND ITS EPISTEMIC POLITICS IN MANUFACTURING

Panagiotis Gkospodinis¹, Chrysoula Mouchtari¹, Panagiotis Paraschos², Dimitrios Koulouriotis¹

¹ *Democritus University of Thrace, Department of Production and Management Engineering, Xanthi, Greece*

² *National Technical University of Athens, School of Mechanical Engineering*

pgkospod@pme.duth.gr

This paper interprets the narrative frames of Cyber-Physical Production Systems (CPPS) and Digital Twins (DT) as labels of an unprecedented Fourth Industrial Revolution. The Faucaldian method, the Social Construction of Technology and sociotechnical imaginaries inform a critical genealogy of how cybernetics, systems theory and successive automation regimes provided the intellectual raw material for both principles- a sequence that dominant accounts have rendered largely invisible.

The theory of feedback-governed purposive behaviour of Rosenblueth, Wiener and Bigelow (1943), the contested politics of numerical control and Computer-Integrated Manufacturing, the Intelligent and Biological Manufacturing Systems Programmes of the 1990s, the Formalisation of the digital twin within Product Lifecycle Management and its aerospace appropriation stretch in a genealogical circle. This curve culminated in the German Industry 4.0 initiative (2011), whose “revolutionary” rhetoric is presented here as a sociotechnical imaginary –manufactured collectively, anchored institutionally and circulated strategically. At each stage, institutional actors, national innovative strategies and formations of power shaped paths to technology that were inevitable when retrospectively narrated. The analysis extends to the emerging Industry 5.0 discourse: The same pattern of institutionally constructed visions is reproduced despite its emphasis on human centrality, sustainability and resilience. These visions function as a second-order imaginary, absorbing criticism of its predecessor while leaving its core political and technological assumptions intact.

Examining the epistemic politics of digital twin production constitutes a central contribution. Manufacturing digital twins operate as knowledge-making apparatuses and not as neutral mirrors of physical reality. These apparatuses privilege epistemologies of formalised and quantitative engineering while sidelining the tacit, situated expertise of shop-floor workers. Drawing on the labour process tradition and recent critical scholarship, the longer history of cybernetic proletarianization is situated whereby successive automation waves restructure allocation of skill, knowledge and decision-making authority between management and labour.

It is concluded that how CPPS and DT obtained their present form is indispensable for equitable technology governance grounded in historical awareness. It argues for recovering historically precedent though politically foreclosed alternatives from designing participatory twin distributing manufacturing architectures to imagine sociotechnical arrangements as recourses that allocate knowledge, agency, and ecological responsibility more justly across the global industrial landscape.

Keywords: Genealogy, Cyber-physical production systems, digital twins, Industry 4.0, Industry 5.0

FROM SANDLOTS TO SMART PLAYGROUNDS: A TECHNOLOGICAL HISTORY OF URBAN PLAY SPACES

Berrak Karaca Şalgamcıoğlu¹, Yasemin Armağan Emiroğlu², Elif Korkmaz², Sümeyye Balaban³

¹*Istanbul University*

²*İSTON-Istanbul Concrete Elements and Ready Mixed Concrete Factories Corporation*

³*Affiliation: İSTON İstanbul Beton Elemanları ve Hazır Beton Fabrikaları Sanayi ve Ticaret A.Ş.*

berrakk@istanbul.edu.tr

This paper traces the technological history of urban playgrounds from informal sandlots to contemporary “smart” play environments, positioning play spaces as critical yet underexamined urban technologies. Rather than treating playgrounds as neutral or purely recreational settings, the study frames them as socio-technical systems shaped by material innovations, safety regimes, pedagogical ideals, environmental concerns, and evolving conceptions of childhood. Through this lens, playgrounds emerge as everyday infrastructures that mediate bodies, behaviors, and urban life.

The paper adopts a historical and interpretive approach, drawing on archival sources, design manuals, municipal regulations, and visual documentation to examine key moments in the transformation of urban play spaces from the late nineteenth century to the present. Early sandlots and improvised play areas are explored as low-tech, community-driven environments rooted in local material practices and social norms. The paper then examines the rise of standardized playground equipment in the twentieth century, highlighting how industrial manufacturing, risk management, and public health discourses reshaped play through steel structures, modular systems, and regulated layouts. These developments reflect broader technological trajectories toward standardization, control, and the rationalization of urban space.

The final section turns to contemporary smart playgrounds, characterized by sensor-based equipment, interactive digital interfaces, and data-driven design logics. These environments are analyzed as hybrid spaces where play intersects with surveillance, educational technology, and environmental monitoring. While often framed as inclusive, innovative, and sustainable, smart playgrounds also raise critical questions about access, data ownership, and the technologization of childhood.

By situating playgrounds within the history of technology, the paper contributes to debates on everyday infrastructures, material culture, and the environmental and social dimensions of urban design. It argues that playgrounds offer a unique vantage point for understanding how technological change operates at the scale of daily life, shaping embodied experience and social interaction. Ultimately, the study demonstrates that engaging with the technological past of play spaces is essential for critically assessing their contemporary transformations and future trajectories.

Keywords: playgrounds, urban, play spaces

FROM SILVER NITRATE TO NEURAL NETWORKS: VISUAL ARCHIVES AND THE TRANSFORMATION OF MEDICAL DIAGNOSIS

Peggy Bloomer

Central Connecticut State University

bloomerp@ccsu.edu

This paper examines medical images as technologies that circulate across institutions, cultures, and historical periods, shaping how bodies, disease, and difference are known and governed. Drawing on nineteenth- and early-twentieth-century medical photography—including daguerreotypes, stereoscopic images, and related visual diagnostic practices—the study traces how photographic systems entered clinical case files and institutional archives, producing new ways of recording, comparing, and standardizing bodies across hospitals, colonial administrations, and public health networks.

These forms of photographic inquiry are not peripheral but constitute a historical through-line linking early medical imaging to contemporary diagnostic systems. As images became increasingly embedded in bureaucratic and clinical infrastructures, technologies of vision shifted medical attention from external observation and narrative patient histories toward internalized, image-based records of disease and treatment. This reorientation of the clinical gaze—away from the situated body and toward visualized pathology—continues to shape how medical knowledge is produced.

Building on this continuity, the paper situates contemporary AI-driven diagnostic systems within this longer visual history, showing how machine-learning models inherit and intensify earlier logics of classification, normalization, and exclusion embedded in photographic and radiological archives. By placing analog and algorithmic imaging within a single analytical frame, the paper demonstrates how medical technologies are continually adapted to local clinical, political, and cultural contexts even as they circulate globally. Methodologically, it combines archival analysis with science and technology studies to argue that medical images function not merely as representations but as enduring infrastructures of medical authority.

Keywords: medical imaging, history of technology, visual knowledge, diagnostic practices, photographic case files, clinical archives, circulation of technologies, history of medicine, classification and standardization

HEIMDAL - THE AIRPORT THAT NEVER WAS

Frode Lindgjerdet

Rustkammeret, Forsvarshistorisk museum, Trondheim, Norway

frode.lindgjerdet@fhm.no

In the interwar period, commercial aviation was in its infancy. During WWI, technology had made leaps, making mass transport by air a future prospect. In the late 1920s, a civilian combined land- and seaplane airport was planned for east of the Norwegian city of Trondheim. The project was moved to a heathland west of Trondheim in the 1930s, the main argument being that it would bring more employment than the alternative because of the extensive groundwork required. However, the work and planning could not keep up with the development towards heavier and faster aircraft. After the invasion of 1940, the Germans chose to further develop the existing military airfield at Vaernes some 30 km east of the city, rather than continue work on the new airport. However, the project were not finally scraped until 1964. Realizing their dependency on NATO funds for infrastructure, the Norwegian Government realized that the alliance was unlikely to support the new airport given the extensive work the Germans had already done at Vaernes during the war. Today, about 70,000 people live in the area allocated to the airport, whom would have lived another place if it had not been for slow planning, fast development of technology and the German occupation 1940-1945.

On the national level, the Norwegian Law on Civilian Air Traffic (Lov om luftfart av 07.12.1923) laid the framework for work on the local level. Four municipalities were involved, but the major case work was done by the City of Trondheim who also produced the majority of the individual sources. Planning documents related to the development of Norwegian military aviation also provide insights. In 1964, a parliamentary committee on civil airfields delivered their final deliberations, which constitutes the main source for the post war developments and the termination of the project (Innstilling fra Flyplassutvalget av 1962). In analyzing the political process and technological development it reflected, qualitative method broadly defined as hermeneutics.

Keywords: Civil Aviation, NATO, Infrastructure, demographics

HERO ALEXANDRINUS PNEUMATICA: TWO DEVICES AND THEIR CONTEXTS THROUGH THE AGES

Michele Corti

Dipartimento di Filologia e Critica delle Letterature Antiche e Moderne (DFCLAM), University of Siena, Siena, Italy/Museo Galileo - Istituto e Museo di Storia della Scienza, Firenze

michele.corti@unisi.it

Based on the line of studies called “replica studies”, this paper will deal with the figure of Hero Alexandrinus, an ancient engineer that lived in Alexandria in the 1st century AD and especially with his book called Pneumatics, a work which talks about the construction of ingenious devices and shows how to make them work. The presentation is going to dwell upon especially two devices described by Hero: the first one is the so-called Owl Fountain, a very interesting waterwork, which, thanks to the employment of siphons, creates the effect of birds singing when the owl doesn’t look at them and then stopping when it looks towards them; the second one is the water organ, a musical instrument activated by a waterpump, a device that we are also aware thanks to a quote by Vitruvius. For each one of them their bond and their legacy will be discussed, analysing the transmission through the ages and the societies that both had in the history of technology. Following the idea of setting the “device in context”, a history of the circulation of ancient technical knowledge will be reconstructed, starting talking about his fields of application in ancient society, with the help of pictures and archaeological findings, and briefly underlining the connection of this technical branch with other forms of knowledge (such as ancient medicine), and then moving on the Fortleben of the presented devices, showing the rediscovery and the reevaluation that other societies made of the ancient Greek pneumatics.

Keywords: Hero Alexandrinus, ancient Greek technology, pneumatics, transmission of technical knowledge

HOW TO MANAGE THE GULF STREAM? FROM DISCUSSING ITS CHARACTERISTICS TOWARD VISIONS FOR HARNESSING THE ATLANTIC OCEAN CURRENT

Simo Laakkonen

University of Turku

simo.laakkonen@utu.fi

The Atlantic Meridional Overturning Circulation (AMOC) is a massive, heat-transporting ocean conveyor belt that includes the Gulf Stream. Driven by temperature and salinity, it moves warm surface water north warming Europe before it cools, sinks, and flows south. The current is typically 100 km wide and from 800 to 1,200 m deep. Gulf Stream transports water at a rate of about 150 million cubic meters per second as it passes Newfoundland, a flow rate nearly 150 times greater than all the world's rivers combined. The warming effect of the stream is the main reason why it is possible to live in the northern Europe, in particular. As a consequence, the Nordic Countries make up the only region in the world where agriculture is practiced near the Arctic Circle. However, recently it has been argued that due to global warming ice caps in the Arctic are melting, the AMOC is weakening and threatening to colder European winters. This is what we know about the Gulf Stream today. But we know very little about the environmental, economic, social and cultural history of the Gulf Stream. When did we "invent" the existence of the Gulf Stream and start discussing its various properties publicly in Northern Europe? How did people and experts conceptualize the stream and its potential impacts on Nordic and European climates and societies? How were its resources intended to be harnessed and, if necessary, "fixed" by technological means, including geoengineering? The proposed paper examines these questions based on an extensive analysis of Finnish-language newspapers from the 1870s to the 21st century. The study argues that the public debate has taken a surprisingly rapid and long leap from discussing its basic properties toward visions for harnessing the resources of this powerful ocean current. The proposed theme is part of a research project supported by the Research Council of Finland, which studies the history of winter in the industrial era.

Keywords: Global, ocean current, history, technology, science, media

ICEBREAKER – A HISTORY OF TECHNOLOGY CHANGING GEOGRAPHY

Saara Matala

Chalmers University of Technology

matala@chalmers.se

An icebreaker is a special-purpose vessel designed to break a navigable channel through frozen water and assist other surface vessels in proceeding. As this paper argues, icebreakers showcase technology capable of changing geography by making polar regions accessible for economic exploitation, military presence, and other human activities.

As large and powerful technological complexes—often carrying a heroic name and a state flag—they are a special case in the history of seafaring technology. Culturally, they have received an unprecedented level of public celebration usually reserved for military flagships. Technologically, many of the qualifications that make a good icebreaker differ from those of open-water ships. More specifically, the factors that define a well-functioning icebreaker—seriously overpowered engines, a thick ice-belt protecting the hull, and a bow designed to break ice—also make them expensive, heavy, clumsy, and generally worse performers in open water. Because of the specialized knowledge required to design and build such vessels, expertise has been concentrated in a few Arctic maritime clusters. This, in turn, has compelled countries interested in Arctic maritime operations to cooperate in techno-scientific development.

This paper examines technology transfer and cooperation projects in Arctic maritime technology that have been initiated as technopolitical tools to advance nation-states' strategic interests in polar regions. The sources include private and governmental archival material and published literature, covering early transatlantic technology transfer at the beginning of the 19th century, as well as larger state-led techno-scientific Arctic technology collaborations between socialist and capitalist countries during the Cold War. Finally, the paper considers the impact of the recent ICE PACT initiative between the USA, Canada, and Finland. By studying the cross-border circulation of technologies and knowledge, the paper contributes to Conference Theme 1: "The history of technology between the local, the regional and the global."

Keywords: arctic, maritime technology, geopolitics, technology transfer

INFRASTRUCTURING IMAGINARIES OF PRODUCTIVISM: TECHNOSCIENCES AND TRANSFORMATIONS IN THE INDUSTRIALIZATION OF ANIMAL HUSBANDRY IN GREECE, 1950-2025

Stathis Arapostathis

National and Kapodistrian University of Athens

arapost@phs.uoa.gr

The paper examines the historical emergence and eventual dominance of industrial modes of chicken and pig production and their by products. The industrialization of poultry and pig production was the outcome of the ascendancy of a productivist imaginary, promoted by both domestic and foreign experts in postwar Greece. This imaginary was closely intertwined with the developmental policies of national reconstruction, as well as with broader discourses and conceptualizations of “modernity” and the framings and connotations of the modern way of life. Flows of animal breeds and expert knowledge, together with the leading role of cooperatives, decisively shaped both the direction and the pace of industrialization. The paper argues that three distinct periods of infrastructuring productivism can be identified. The first period, extending until the mid-1960s, can be described as proto-productivism, as it represents an early phase in which constraints imposed by climate, weather, geography, and the capacities of farming communities played a significant role. The second period, spanning from the mid-1960s to 2000, can be characterized as a productivism of hubris, marked by the massive expansion of industrialization based on logics of domination and control over nature and animal bodies. The third period is that of certified humility, during which a turn towards sustainability reshaped practices and modes of production without fundamentally challenging the core visions and ideals of productivism. The analysis draws on archival research and oral histories with stakeholders and key protagonists of the poultry industry.

Keywords: agrifood, productivism, sociotechnical systems, hubris, imaginary

INNOVATION WITHOUT EQUITY: RACE AND MEDICAL TECHNOLOGY

Alyssa Cole

University of Florida

cole.alyssa@ufl.edu

This panel interrogates the persistent disconnect between medical innovation and racial equity, arguing that technological advancement in medicine has repeatedly unfolded alongside, rather than in opposition to, structural inequality. The panelists demonstrate that innovations such as vaccines, pharmaceutical prophylaxis, surveillance tools, and professionalized medical technologies cannot be equitably deployed while racial barriers in housing, education, labor, and state power remain intact. The promise of medical technology is routinely undermined by the social determinants of health. Collectively, these papers challenge the notion that racial health disparities can be solved solely through technological solutions.

Dr. Aishah Scott examines the limits of medical innovation in reducing racial health disparities in the United States, focusing on the uneven distribution of lifesaving technologies. Using COVID-19 vaccination campaigns, HIV prevention via PrEP, and OUD treatment access as evidence, this research demonstrates how structural racism persists despite medical breakthroughs. Scott argues that technological optimism obscures the structural conditions that reproduce racialized vulnerability and constrain the public health impact of innovation.

Dr. Jeremy Lowe traces the origins of violence epidemiology as a public health discipline through the Atlanta Missing and Murdered Children cases (1979-1981). Focusing on the involvement of epidemiologists and Epidemic Intelligence Service officers from the Centers for Disease Control and Prevention and the Fulton County Board of Health, Lowe reveals how public health methodologies were first systematically applied to study youth violence. The paper also interrogates how racialized surveillance and Black urban vulnerability shaped the field's development.

Dr. Alyssa P. Cole historicizes medical innovation in the early twentieth century by centering Black women's labor within Black medical institutions during a period of professionalization and technological change. Activists, nurses, and social workers played a crucial role in sustaining Black hospitals as new standards threatened their survival. Cole highlights how Black women's organizing and care work functioned as an essential infrastructure that enabled medical innovation under conditions of racial exclusion.

Together, these papers argue that innovation without equity is structural, not accidental. The panel calls for a critical rethinking of medical technology that foregrounds race, power, and the social conditions that determine who innovation ultimately serves.

Keywords: history, equity, medical technology, race, medicine

THE UNEVEN PROMISE OF MEDICAL INNOVATION: RACE, TECHNOLOGY, AND HEALTH DISPARITIES

Aishah Scott

Assistant Professor Health Sciences and Black Studies Providence College Providence, RI

ascott7@providence.edu

My work examines the limits of medical innovation in reducing racial health disparities in the United States, focusing on the uneven distribution of lifesaving technologies. Using COVID-19 vaccination campaigns, HIV prevention via PrEP, and OUD treatment access as evidence, this research demonstrates how structural racism persists despite medical breakthroughs. Even when technologies are clinically effective, inequities in social determinants of health restrict access for marginalized communities. I argue that technological optimism obscures the structural conditions that reproduce racialized vulnerability and constrain the public health impact of innovation.

Keywords: Medical Technology, History of Medicine

INSTRUMENTS, IMAGES, AND THE HEAVENS: NON-OFFICIAL ASTRONOMICAL PRACTICES AND LITERATI KNOWLEDGE-MAKING IN QING CHINA

Jiajing Zhang, Haoxuan Liu

University of Chinese Academy of Sciences, Beijing, China

zjj@ucas.ac.cn

This article investigates non-official astronomical instruments and star maps used by literati in Qing China, focusing on how material practices shaped knowledge of the heavens beyond imperial institutions. Drawing on a newly compiled dataset that integrates individuals, technical practices, knowledge sources, social relations, and terminology, the study reconstructs an understudied domain of astronomical activity outside the state-sponsored observatory system.

Rather than approaching Qing astronomy primarily through texts, calendars, or institutional reforms, this article foregrounds instruments and visual representations as central mediators of observation, calculation, teaching, and verification. It demonstrates that non-official practitioners actively engaged with multiple knowledge traditions—including classical Chinese astronomy, imperial standards, and selectively adopted Western techniques—through hands-on interaction with devices and diagrams.

By examining instruments and star maps as both epistemic tools and social objects, the article shows how astronomical knowledge circulated through local networks of literati, artisans, and publishers, where credibility was established through practice, pedagogy, and social relations rather than formal authority. This study argues that attention to non-official astronomical practices complicates state-centered narratives of Qing science and highlights the plurality of material knowledge-making in early modern China.

Keywords: Qing China, Scientific Instruments, Star Maps, Literati Culture, Material Knowledge, Non-Official Knowledge

INTERNATIONAL INNOVATION OF CONSTRUCTION: DYWIDAG, FRANKE AND B.R.C., THREE FUNDAMENTAL CONSTRUCTION COMPANIES IN EARLY 20TH CENTURY IN CHILE

Renato D'Alençon Castrillón, Francisco Prado García

P. Universidad Católica de Chile

dalencon@uc.cl

In this work, we study the work of three important construction companies that operated in Chile during a time of economic prosperity, technological and urban change, between 1919 and 1932, which was reflected in the technical innovation of construction, thanks to the introduction of reinforced concrete and building systems: electricity, elevators, telephone, drinking water and sewage networks; which made high-rise construction possible and with it a new economic and social model for the city.

The works built in Chile by Dyckerhoff und Widmann (DYWIDAG, a German construction company); Franke Jullian & Cía. (a Chilean construction company); and British Reinforced Concrete (B.R.C., a British construction company) demonstrate, each with its own distinct framework, substantial changes in the construction process, beyond stylistic choices still rooted in conventional forms at the time. These companies operated with diverse management and financing models, employing new technical complexities within international networks of knowledge and the supply of materials and components.

Furthermore, the operation of the foreign-owned industrial and financial conglomerate was intertwined with the technological innovations and systematization of construction processes developed in Chile during this period. Technical innovation, particularly in the use of reinforced concrete and contemporary construction methods, was systematically consolidated through its application in these emblematic projects of the era, representative of the country's main export industry and its international commercial and financial networks.

The results of these innovations are reflected in the construction of large public, industrial, and transportation infrastructure; high-rise buildings for government offices and housing; and long-span structures for theatres, swimming pools, and markets. The activities of these companies show the means of production characteristic of European industrialization were introduced into the Chilean construction sector not through development based on the mechanization of existing local production structures, but rather through the establishment of the industrial and financial conglomerate that European powers were already capable of deploying.

Keywords: Internationalisation, Innovation, Construction, Import, Networks

ISLANDS AS LABORATORIES: LOCALISING GLOBAL ENERGY TECHNOLOGIES IN THE AEGEAN

Konstantinos Gkarakis

Department of History and Archaeology, School of Philosophy, University of Ioannina, Ioannina, Greece

kgarakis@otenet.gr

Energy transitions are often narrated through global statistics and international agreements, yet their material realisation is profoundly local. This paper explores how globally circulating renewable energy technologies were adapted, negotiated, and reinterpreted in insular Greece during the late twentieth century, with particular attention to the island of Kythnos.

During the 1980s and 1990s, Kythnos hosted pioneering wind turbines, photovoltaic systems, and one of Europe's earliest island hybrid microgrids. These projects were embedded in European research networks and transnational exchanges of expertise. Danish and German wind and solar technology, European funding schemes, and Greek engineering know-how converged in a small Aegean landscape characterized by geographic isolation and strong local identity.

Rather than presenting the island as a passive recipient of imported technology, the paper argues that Kythnos functioned as a site of co-production. Technologies were adjusted to climatic conditions, grid constraints, and local expectations. Engineers negotiated with residents; experimental systems revealed the limits of technical planning; maintenance practices became central to the survival of installations. Through these processes, global renewable technologies acquired locally specific meanings.

By combining archival documentation with oral histories and landscape analysis, the paper highlights the frictions between international technological optimism and local lived experience. It shows how insular infrastructures made visible the material realities of intermittency, storage limitations, and institutional experimentation long before “smart grids” became a policy buzzword.

Conceptually, the paper contributes to debates on localisation and globalisation in technological change. It demonstrates that peripheral regions—often viewed as technologically marginal—can serve as experimental frontiers that shape broader trajectories of innovation. In doing so, it reframes island renewable infrastructures as nodes in transnational technological networks rather than isolated curiosities.

The case of Kythnos suggests that the history of technology must move fluidly between scales, recognising how planetary ambitions for decarbonisation are materially enacted—and contested—in specific places.

Keywords: Technological Circulation, Localisation of Innovation, Island Energy Systems, Renewable Energy History

LIVING TECHNOLOGIES AND COLD WAR DEVELOPMENT: AFRICANIZED BEES IN LATIN AMERICA

Jo Klanovicz

Universidade Estadual do Centro-Oeste (Unicentro)

jo@unicentro.br

This paper examines the introduction of African honeybees into Latin America during the Cold War as a case study of the unintended consequences of developmentalist technoscience. Embedded in state-led modernization programs and shaped by Cold War scientific networks, the circulation of these bees was not a biological accident but a planned technological intervention. Designed to increase apicultural productivity, adapt beekeeping to tropical ecologies, and overcome the perceived limitations of European bee lineages, the project exemplified the technocratic optimism characteristic of mid-twentieth-century development regimes. Drawing on environmental history, science and technology studies (STS), and the historiography of the Green Revolution, the paper conceptualizes bees as “living technologies” — biological infrastructures mobilized to solve developmental problems through scientific expertise. Unlike seeds, fertilizers, or mechanized inputs, however, bees introduced mobility, autonomy, and multispecies agency into modernization schemes. Their escape and subsequent hybridization with European populations exposed the limits of technocratic control over complex ecological systems. The rapid dispersal of Africanized bees across the Americas revealed the geopolitical asymmetries of Cold War development: ecological and bodily risks were disproportionately borne by rural populations and tropical landscapes. By foregrounding nonhuman agency, this study challenges linear narratives of modernization centered on productivity and control. It argues that biological interventions generated new forms of environmental uncertainty, social vulnerability, and embodied risk while simultaneously reshaping rural ecologies and practices. The Africanized bee thus compels a reconsideration of the Green Revolution beyond seeds and yields, highlighting the multispecies, unpredictable, and often violent dimensions of Cold War modernity in the Global South.

Keywords: Cold War development, Africanized bees, Latin America, Environmental modernization, Technopolitics

MAKING 'NEW SCIENCE' PUBLIC: PRINT, LANGUAGE, AND CURRICULUM IN THE OTTOMAN EMPIRE

Nihal Özdemir

Fatih Sultan Mehmet Vakıf University, Istanbul, Turkey

nozdemir@fsm.edu.tr

This paper examines how “new science” became public in the nineteenth-century Ottoman Empire by focusing on the technological and institutional means of circulation rather than on scientific content alone. It argues that modern scientific knowledge was actively made public through the combined operation of print technologies, linguistic transformation, and curricular reform, which functioned as epistemic technologies shaping access, legitimacy, and scale.

First, the paper analyses print as a technology of circulation, highlighting the role of periodicals, textbooks, and translation projects in expanding and standardising scientific knowledge. Print not only multiplied texts but also structured scientific genres, terminologies, and modes of explanation.

Second, it conceptualises language as a technology, showing how translation, simplification, and terminological reconstruction enabled specialised knowledge to reach broader audiences. Linguistic mediation redefined the boundaries between experts, students, and lay readers, directly affecting epistemic inclusion.

Third, the paper examines curriculum as a technology of institutionalisation. Schools and teaching programmes provided scientific knowledge with pedagogical form and official legitimacy, stabilising it as teachable and socially relevant knowledge.

By foregrounding print, language, and curriculum as interconnected technologies of mediation, the paper challenges linear and diffusionist narratives of scientific modernity. The Ottoman case demonstrates that the public life of science emerged through locally embedded infrastructures that connected the local, regional, and global. This circulation-based perspective contributes to broader debates in the history of technology and the making of scientific publics.

Keywords: History of Technology, Knowledge Circulation, Print Culture, Scientific Language, Ottoman Empire

MYTHS, MYTHOLOGIES, AND MISSILES

Zsuzsanna Ihar

Max Planck Institute for the History of Science

zihar@mpiwg-berlin.mpg.de

'In distant outposts of the faith, at Westminster, Brussels, and the Hague, Druidical servitors will bow low to the West and incant missilic runes.' So predicted English historian EP. Thompson in his article 'Notes on Exterminism, the Last Stage of Civilization'. It was 1980, and the development and refinement of military matériel was in full swing, propelled by the aggressive build-up of Britain's nuclear and offensive capabilities. However, twenty years prior, missilic runes were already being incanted off the far-north-west coast of Scotland by 'Druidical servitors', in the form of the UK's Military of Defence (MOD). This paper traces the arrival of missile technology to the Outer Hebridean island of South Uist and its integration into the cosmology of a predominantly Gaelic crofting community. Drawing on local newspaper articles, oral histories, Gaelic folklore collections, and declassified archival documents, I examine how residents framed the intrusion of military objects, technologies, and infrastructures through forms of storytelling, myth, song, and poetry. Rather than interpreting these narratives purely as resistance or frictionless accommodation, I propose the notion of 'military folklore' – a vernacular epistemology through which communities negotiated the moral and ontological shock of high technology entering an ostensibly peripheral world. The analysis illuminates how technological modernity was not merely imposed from metropolitan centres but was actively reinterpreted and localized. The Guided Missile Range became both a symbol of futurity and a cosmological challenge—a paradox encapsulated in local idioms that recast missiles as otherworldly presences, divine omens, fraught apparitions. By approaching the Outer Hebrides as a node in a transnational military network rather than a passive recipient of state technology, the paper situates this episode within broader debates on the circulation and translation of expertise and infrastructure, and the multi-scalar (and perhaps non-secular) nature of military influence. In methodological terms, I draw on the history of technology's recent 'global turn' alongside anthropological approaches to place and modernity – in particular, the concept of the non-secular Anthropocene. The Hebridean case complicates assumed core–periphery hierarchies, revealing how the everyday practices of storytelling, belief, and mythopoetic traditions mediated the Cold War's technological frontiers.

Keywords: military technology, missiles, folklore, Scottish Hebrides, mytho-technologies, Cold War, archipelago

NMM6: MARINER'S ASTROLABES, NAUTICAL MANUALS, AND IMPERIAL SCIENCE IN THE EARLY MODERN IBERIAN WORLD

Luis Iturriaga

University of Cambridge

laiturriaga@protonmail.com

In 1903 a nautical or mariner's astrolabe was found in Veracruz, Mexico. The object (NMM6) was eventually sold to the Oxford History of Science Museum. In Robert Gunther's *Early Science in Oxford* (1923) and the encyclopedic work on nautical astrolabes by Alan Stimson (1988), the uniqueness of the instrument is noted. An 'A' mark, accompanied by a star, which the astrolabe sports in its bottom ballast has resisted identification, not being found in its same shape or configuration in any other surviving astrolabe. The instrument's dual graduation and unusual size were also considered. Due to the location of the find, the object was tentatively attributed a Spanish origin and an early 17th century dating. Notable works on nautical astrolabes, like Stimson's *The Mariner's Astrolabe* (1988) or the 2023 Ship Library [ShiLib] report, have focused on cataloguing surviving instruments and comparatively analyzing their basic features, such as their size or ballast design, in an attempt to establish analytical frameworks of classification (usually along national lines). I look to more closely examine NMM6's formal and material features, as well as to consider supplementary documental evidence. Spanish imperial sources suggest, by themselves, a picture of early modern Iberian science that is heavily centralized, monopolized, and strictly regulated by institutions in Seville. Particularly, nautical manuals and Royal Ordinances were issued in an attempt to standardize the quality and production of nautical instruments. While some mariner's astrolabes have been the subject of detailed historical reconstructions, this paper will be unique in its thorough examination of a broad selection of nautical manuals and other relevant documents beyond those usually considered. Though possible points of identification for the object's nation of origin are explored, it is clear that NMM6's unique design stresses traditional analytical categories beyond their historiographical utility. This paper does not point towards a novel national classification for NMM6, but to a more dynamic and less centralized picture of Spanish imperial science and an appreciation of mariner's astrolabes as both having been moving through and being a product, both formally and materially, of the global circulation of objects and ideas across the Iberian world.

Keywords: Iberian history, astrolabes, imperial science

PEOPLE BEHIND THE SCENES: THE OTTOMAN INSPECTION COMMISSION AND THE TECHNOPOLITICS OF INTERCHANGEABLE MANUFACTURE

Zeynep Sabancı

*University of Basel | Faculty of Humanities and Social Sciences Department of Social Sciences Near and Middle
Eastern Studies*

zeynep.sabanci@unibas.ch

This paper examines the Ottoman Inspection Commission of the Ordnance Department as a technopolitical mediator in the transfer and domestication of the American system of interchangeable manufacture in the second half of the nineteenth century. While the “American system” has often been treated as a story of industrial innovation rooted in the United States, its transnational circulation and adaptation remain underexplored. By focusing on the Ottoman case, this study shifts attention from industrial centers to the bureaucratic and diplomatic actors who enabled technological translation across imperial boundaries. Interchangeability—defined as the precision manufacture of standardized components allowing uniform repair and replacement—emerged as a crucial feature of modern small-arms production during and after the American Civil War. For the Ottoman Empire, facing military and industrial restructuring, the adoption of this system was not merely a technical decision but a political and administrative process. The Inspection Commission, composed of engineers, officers, and technical experts, played a central role in evaluating imported machinery, auditing foreign contracts, and supervising the adaptation of precision manufacturing techniques within indigenous armament complexes in Istanbul. Key intermediaries such as Edward Blacque (Blacque Bey) and Hüseyin Tevfik, the Ottoman ambassador to Washington and a member of the Inspection Commission, exemplify how diplomatic and technical expertise intersected in the management of arms procurement and industrial transfer. Drawing on archival correspondence between Ottoman officials and American arms manufacturers such as the Providence Tool Company and Springfield Armory, this paper traces how knowledge, machinery, and expertise circulated between the two polities. It argues that the Ottoman transition toward interchangeable production depended less on direct technological imitation and more on bureaucratic mediation, diplomatic negotiation, and technical translation. By situating Ottoman arms modernization within global networks of industrial capitalism, this paper contributes to broader discussions on the circulation of expertise, the political dimensions of precision manufacturing, and the role of state institutions in shaping technological change. In doing so, it engages the history of technology as a field that bridges military, economic, and political histories across local and global scales.

Keywords: Ottoman arms industry, bureaucratic mediation, precision manufacturing, transnational technology transfer

PIONEER WIRELESS TELEGRAPHY THROUGH THE CHACAO CHANNEL. CHILE 1898

Rodrigo Rivero-Cantillano

Department of History and Social Science, Faculty of Liberal Arts, Adolfo Ibáñez University, Santiago, Chile.

rodrigo.rivero@uai.cl

The history of telecommunications in Chile remains a relatively understudied field, despite the sector's formative role as a catalyst for modernisation and its profound imprint on Chilean society. This paper examines a case study hitherto unknown to Chilean historiography: the installation of a wireless device across the two banks of the Chacao Channel in 1898, conceived and developed by an official of the State Telegraph Service as a practical response to the recurrent and costly breakages of the submarine cable linking the island of Chiloé to the mainland. That this occurred during the experimental stages of wireless technology and far from the principal centres of its development invites a reconsideration of the historical contexts in which peripheral countries actively participated in early technological adaptation and innovation, complicating traditional narratives of technological dependence.

Drawing on administrative reports, technical correspondence, and contemporary press accounts, the paper reconstructs the technical rationale, institutional context, and material constraints that shaped this local adaptation of an emerging technology. In doing so, it integrates perspectives from economic history and the history of science and technology, attending in particular to the interaction between infrastructural fragility, state capacity, and local technical expertise as the conditions that made this appropriation necessary and possible.

Keywords: wireless telegraphy, telecommunications, Chile

REDESIGN OR OPTIMIZATION? TWO TRAJECTORIES OF TECHNICAL ASSISTANCE IN SOCIALIST VIETNAM'S STEELMAKING

Xun Wang

PhD Candidate, Department of Southeast Asian Studies, National University of Singapore, Singapore

wang_xun@u.nus.edu

How do industrial technologies travel across unequal technical landscapes, and why do some transferred systems invite redesign while others prompt element-level optimization? This study examines divergent trajectories within the Thái Nguyên Iron and Steel Plant in northern Vietnam through the lens of designer–user distance, focusing on two steelmaking workshops constructed under different socialist collaborations: the Chinese-assisted Lưu Xá workshop (late 1950s–1970s) and the East German-assisted Gia Sàng workshop (late 1960s–1970s). It argues that variation in designer–user distance shaped not only how performance tensions were interpreted, but also when and to what extent technological renegotiation was possible.

At Lưu Xá, Chinese and Vietnamese engineers engaged in prolonged joint surveys, iterative design revisions, and debates over steelmaking routes during construction and late-stage recovery. Although asymmetries in technological expertise remained, this collaborative process left key technological pathways open to renegotiation prior to full realization. As a result, questions concerning furnace type, casting techniques, and future expansion were revisited on multiple occasions before the steelmaking section entered routine operation.

At Gia Sàng, by contrast, collaboration with East Germany unfolded under conditions of greater technological and institutional asymmetry. The steelmaking section was implemented according to a more settled design developed over a shorter period, and significant performance shortfalls became apparent only after delivery. Subsequent intervention focused on spatial layout, equipment supplementation, labor organization, and managerial practice, while the chosen steelmaking pathway itself remained largely uncontested. Here, technological renegotiation took the form of element-level optimization rather than pathway redesign.

Drawing on Vietnamese, Chinese, and German archival sources, this study shows that socialist technology transfer was neither uniform nor frictionless. Instead, the interaction between designer–user distance and the degree of technological stabilization shaped the timing, scope, and direction of renegotiation. By foregrounding temporal variation within socialist industrial collaboration, the study contributes to global histories of technology by demonstrating how socialist technical assistance projects reorganized technological hierarchies and constraints, rather than eliminating them.

Keywords: Vietnam, socialist technical assistance, technology transfer, steelmaking, designer–user distance

RISK IN A GLOBAL AGE: FIRE EXHIBITIONS AND TECHNOLOGICAL EXCHANGE IN THE NORTH ATLANTIC AND COLONIAL WORLD, 1901-1904

Jan Hua-Henning

Duke Kunshan University

jan.huahenning@duke.edu

At the dawn of the twentieth century, Berlin (1901), London (1903), and St. Louis (1904) hosted major international fire exhibitions. Their organizers considered them the pinnacle of fire response and prevention. They invited manufacturers, businesspeople, architects, fire departments, and anyone interested in supporting this form of risk management. Visitors were drawn by the utopian idea of the heavily technologized, fire-free city. World fairs and international exhibitions are well-researched phenomena. They invite analytical insight into the convergence of ideas, actors, and artifacts on the international stage. Yet, we still know little about how these events contributed to emerging global cultures of risk and emergency. Fire exhibitions and congresses became common at the end of the nineteenth century. They offer an exceptional lens through which to view the genesis, operations, and scope of an international network of risk response. Exhibitions served as hubs where individuals and organizations, ideas and imaginaries, and technologies of fire management met. They facilitated the circulation and exchange of knowledge and artifacts. My paper argues that these exhibitions contributed to the material advancement of the risk society across industrialized nations and large parts of the globe. Nation-states actively supported these events, seeking to position themselves as guarantors of safety and to assert a leading position within growing markets. Part of my paper will move beyond exhibitions, examining the transfer of technologies for fire response into colonial contexts, highlighting hybridization under uneven power relations. My paper gives much-needed insight into the historical genesis of the risk society and the modern preoccupation with risk that is guided by technoprogressive ideals. As scholarship shares an increasing belief that managing risks will be the main challenge for future generations, it becomes crucial to identify distinct, entangled, and shared cultures of risk.

Keywords: risk, disaster, exhibition, commodification, North Atlantic World, colonialism

SCIENTIFIC MISSIONS AND THE CIRCULATION OF KNOWLEDGE: PROFESSORS, MOBILITY, AND APPLIED SCIENCE BETWEEN UNIVERSITY AND STATE (1790–1815)

Carlos Fernando Teixeira Alves

RE:CENT - Center for Medieval Visual Cultures and Research Communication, Department of Art History, Faculty of Arts, Masaryk University

256980@mail.muni.cz

This paper examines scientific missions as key vehicles for the circulation of technological knowledge in late eighteenth- and early nineteenth-century Europe. Focusing on the scientific voyages of José Bonifácio de Andrada e Silva (c. 1790–1800) and Manuel Pedro Homem de Mello (c. 1801–1815), both professors at the University of Coimbra, it analyzes how academic expertise moved across borders and between institutional arenas, linking universities, state administrations, and sites of practical intervention.

Recent scholarship in the history of technology and science has emphasized circulation, mobility, and practices over linear models of diffusion (Raj 2007; Secord 2004; Roberts 2009). Building on this literature, the paper argues that scientific missions constituted hybrid spaces in which observation, learning, and application were inseparable. During their travels across Europe, Andrada e Silva and Homem de Mello engaged with foreign scientific institutions, mines, manufactories, laboratories, and administrative bodies, acquiring techniques and modes of reasoning that were subsequently adapted to Portuguese political, economic, and environmental contexts. Upon their return, both figures were repeatedly mobilized by the state to operate beyond the university, contributing to mining projects, natural resource management, industrial experimentation, and administrative reform.

The paper addresses three interconnected research questions: how were scientific missions conceived by states as instruments of technological transfer and political modernization? How did mobile professors negotiate between universal scientific claims and local institutional, environmental, and social constraints? And how did these practices blur the boundaries between academic knowledge, technology, and governance? Through a comparative analysis of these two trajectories, the paper highlights both the possibilities and structural limits of knowledge circulation in a European semi-peripheral context.

Methodologically, the study combines biographical analysis with institutional and material perspectives, treating scientific missions as practices embedded in networks of power, patronage, and expertise (Edgerton 2006; Mitchell 2002). By foregrounding mobility and application rather than isolated innovation, the paper contributes to ongoing debates on expert circulation, the co-production of science and the state, and the long-term historical roots of contemporary discussions about the social and political responsibilities of scientific expertise.

Keywords: Knowledge circulation, Mobility of experts, Hydraulic and applied science, Portugal, late 18th–early 19th century, State–science relations, Technology transfer

SUSTAINABILITY, WELL-BEING AND A GREEK CONNECTION: THE CASE OF THE ALUMINIUM INDUSTRY IN DELFZIJL, IN THE NORTHERN NETHERLANDS

Frank Veraart, Dulce Van Vliet

Eindhoven University of Technology

f.c.a.veraart@tue.nl

This contribution examines the economic, social, and environmental history of the municipality of Delfzijl through the lens of sustainable development, with particular attention to the aluminum industry. The aluminium smelter Aldel was founded in 1966 by KNHS, the Koninklijke Hoogovens steelworks (today Tata Steel IJmuiden), and it became central to Delfzijl's economy and employment. Its establishment was directly connected to the Dutch government's mid-20th century strategy of stimulating regional development through large-scale industrialization projects, while taking advantage of Delfzijl's deep water port and low-cost natural gas, extracted in the region. Notwithstanding the local availability of resources and infrastructure, the raw materials for aluminum processing still needed to be imported and these (bauxite and aluminum ores) came from Greece, one of the largest suppliers to the Dutch aluminum sector, in particular between the 1970s and the 1990s. This international supply chain underscores the global dependencies embedded in local industrial development, connecting Delfzijl to the extraction regions of Central Greece.

However, in the long run, this industrialization project did not prevent socio-economic decline. Delfzijl and its surrounding areas now rank among the Netherlands' most structurally disadvantaged regions, marked by sustained population loss, shrinking public services, low income growth, high unemployment, and deteriorating urban conditions. This contribution examines these intertwined economic, social, and environmental dynamics by combining historical statistical data with media-heritage analysis, namely digitized historical newspapers. This study aims to integrate quantitative trends with qualitative media narratives, namely shifting public perceptions, political debates, and societal responses to the aluminum industry's impact in the municipality of Delfzijl.

Keywords: Regional, National, Transnational, Well-being, Sustainability, Aluminum

TECHNOLOGICAL MOMENTUM UNDER GEOPOLITICAL INVERSION: JINR'S BROKERAGE AFTER 1991 AND AFTER 2022

Vitaly Pronskikh

Center for Slavic, Eurasian, and East European Studies, University of North Carolina

vpronskikh@gmail.com

JINR after 1991 is often narrated as a “Soviet holdover” that somehow endured. I argue instead that its survival can be read through technological momentum: a cumulative assemblage of large instruments, procurement routines, training pipelines, and collaboration interfaces that, once built, pushes an organization to reproduce itself even as regimes and alliances shift. Using JINR as a case, I ask: when does momentum become resilience, and when does it become a liability?

The paper reconstructs a two-step reorientation. During perestroika and the 1990s, JINR stabilized by deepening links to CERN and Western laboratories, repositioning Dubna as a West-facing hub that brokered access for less-resourced partners in Asia and the post-Soviet space. This brokerage was not merely diplomatic; it was infrastructural. Shared detector standards, data formats, safety cultures, visiting practices, and co-authorship regimes formed a “boundary interface” that translated between unequal scientific economies.

The 2022 invasion of Ukraine and subsequent sanctions fracture this interface. I analyze how sanctions disrupt momentum not only by removing funding or components, but by breaking the mundane coordination technologies that made brokerage possible: payment channels, export-controlled electronics, vendor qualification, software licensing, conference mobility, and reputational trust. These disruptions force a shift in collaboration modality—from West-mediated participation in global experiments toward South–South and Eurasian partnerships where expectations about openness, intellectual property, and division of labor can differ sharply.

I identify failure modes that can undermine momentum: (1) asymmetrical partnerships with China/India where JINR becomes a junior site rather than a broker; (2) path dependence that locks resources into legacy facilities while new partners invest elsewhere; (3) governance strains inside JINR as member states diverge in risk tolerance and sanctions exposure; and (4) “epistemic secession,” where data and standards bifurcate, reducing interoperability.

The contribution is a model of how megascience institutions survive geopolitical turns by re-brokering their interfaces—and how those interfaces can become brittle under sanctions. It reframes JINR as a boundary organization under pressure.

Keywords: JINR, international collaborations, mega science, global and local, sanctions

THE DIALOGIC CONSTRUCTION OF TECHNOLOGICAL IMAGINARIES: BETWEEN FOUNDING NARRATIVES AND BUILDING COMMUNITY.

Marie-Clémence Jalaber

Anthropology, PhD student, LARHRA - University Lyon2, Lyon, France

mc.jalaber@univ-lyon2.fr

The field of technoscience constitutes a major fertile ground for the development of symbols and discourses that have a strong impact on society. This proposition aims to analyze the construction of technoscientific imaginaries within national and founding narratives (Chifflet, 2009).

Technoscientific fields are evident forms of economic, political, and social investment, and the dynamics that have made them as such are both theoretically important and empirically observable. Techno-optimism has been influential regarding technological developments: historically, the field of AI has for example been a disciplinary chapter marked by significant periods of enthusiasm and periods of neglect when the field stagnated. Artificial intelligence has moved from a domain to a figure, socially and culturally, crystallizing individuals' feelings toward technological advances.

This proposition intends to reflect on these periods with culturally significant products of pop-culture (as a historic perspective on the figure of AI, but not only) but also with the presentation of a relatively recent object of cyberculture, such as digital nations, and their discourses, to question the place of technoscientific imaginaries in the building of society and community.

Technoscientific imaginaries in pop culture are mirroring periods views, ideas, and concrete dreams about what animated the world (fear or hope) and shaped relationships between humans and machines.

Today, through modern dynamics of narratives of technoscientific imaginaries, forms of community and new modalities of identity are emerging, particularly around forms of digital nations, considering the imaginary as a form of narrative constitutive of reality as for Taylor (2004) and Castoriadis (1999). These dynamics must, however, be criticized in light of the cyberspace and the theory around it, as it was thought as an equal place for every public, though reproducing and reinforcing inequalities (Escobar, 1994).

Keywords: Technoscience, digital nation, popular culture, technoscientific imaginary, narratives

THE EVOLUTION OF MASS MEASUREMENT METHODOLOGY AND TECHNIQUES AT THE ROMANIAN NATIONAL INSTITUTE OF METROLOGY DURING THE PERIOD 1889–2018

Adriana Vâlcu

ROMANIAN ACADEMY, CRIFST-DIT

adivaro@yahoo.com

The need for standardized units of measurement, driven by economic development, trade, and scientific progress, led to the emergence of unified systems of measurement, such as the International System of Units (SI). Their purpose was to replace diverse local units, reduce trade barriers, prevent fraud, and ensure measurement accuracy in science and industry. This process accelerated in the 19th century with the expansion of international trade and culminated in the global adoption of SI units. A defining milestone was the signing of the Metre Convention on May 20, 1875, which established the framework for international harmonization of measurements.

Before the metric system, numerous units were used across the Romanian territories, varying by region and historical period. The introduction of the metric system in the Romanian Principalities began before 1848, supported by favorable economic and geopolitical conditions. Inconsistent measurements posed serious obstacles to trade, a problem resolved only after the Union of January 24, 1859, which enabled unitary legislation. The metric system was officially adopted as the sole system of measurement by the law signed on September 15, 1864, by Alexandru Ioan Cuza. In 1883, Romania acceded to the Metre Convention, becoming its 19th member.

This paper presents the evolution of mass metrology in Romania between 1889 and 2018, outlining major legislative, institutional, and technical developments, in the context of the worldwide accepted redefinition of the kilogram in 2018.

It analyzes the approval of the international prototypes of the metre and kilogram in 1889 at the first General Conference on Weights and Measures and the establishment in Bucharest of the Central Office for Weights and Measures (SCMG), responsible for ensuring measurements uniformity and supervising measuring instruments used in trade. After 1944, structural changes occurred: in 1951 the SCMG became the Institute of Metrology, and in 1974 the National Institute of Metrology, entrusted with developing and maintaining national standards, ensuring SI traceability, and disseminating measurement units.

Following the 1989 Revolution, metrology was reorganized according to market economy principles, Romania becoming a member of several international metrology organizations. In 1999, the National Institute of Metrology joined the CIPM MRA, enabling international recognition of Romania's measurement results.

Keywords: Mass Measurement Methodology, Metre Convention, kilogram prototype.

THE FAEROP FESTIVAL MODEL: INDUSTRIAL HERITAGE AS A LIVING ECOSYSTEM FOR SUSTAINABLE REGIONAL DEVELOPMENT

Maria Petra¹, Chrysoula Mouchtari²

¹PASTALI. NPO (formal institutional member of TICCIH International)

²Democritus University of Thrace, Department of Production and Management Engineering, Xanthi, Greece

petra.maraki@gmail.com

The FAEROP Festival is Greece's first nationwide initiative dedicated to productive and industrial heritage, launched in 2024 by the PASTALI NPO under the auspices of the Hellenic Ministry of Culture and TICCIHellas. This paper examines FAEROP as a methodological framework for reinterpreting regional productive identity through technological history, cooperative legacy, and industrial ecology. The model bridges Industrial Archaeology, Engineering, and Biology, reframing historical sites—such as the Pastali tobacco farmhouses in Xanthi, operating as a Research & Archaeology Residency/Station—as platforms for circular economy. Drawing inspiration from the region's cooperative past (συνεταιρισμοί), FAEROP proposes a collaborative governance for cultural assets and acts as an "apprenticeship gateway", linking craft knowledge with technical education to build a renewed "productive consciousness."

Keywords: FAEROP festival, industrial ecology, tobacco, circular economy

THE JOURNEY OF THE BASSET METHOD: METALLURGY, CEMENT-MAKING AND TECHNOPOLITICS ACROSS BORDERS (1930-1945)

Jaume Sastre-Juan¹, Gemma Garcia-Alonso²

¹ *Institute for the History of Science, Universitat Autònoma de Barcelona*

² *Department of Physics, Universitat Autònoma de Barcelona*

jaume.sastre@uab.cat

This paper analyzes the invention, circulation, and appropriation of the Basset method for the simultaneous production of cement and iron in a rotary kiln. Patented in 1930 by the prolific inventor-entrepreneur Lucien Paul Basset, the method emerged after Basset had been at the center of a widely publicized industrial and financial scandal surrounding a failed direct-reduction process—an episode documented not only in technical journals but also in economic and financial periodicals.

Drawing on a wide range of archival sources, from photographs and patent files to laboratory analyses, technical periodicals, and three-dimensional models, our paper follows the artefacts, the investors, the knowledge practices, and the technicians involved as the Basset method travelled across borders: from its initial development in the cement factory-laboratory of Dennemont, near Paris (France), to its documented implementation in the Asland cement works in Montcada, near Barcelona (Spain), and later in the Cimento Tejo factory in Alhandra, near Lisbon (Portugal).

Adopting a non-innovocentric gaze on metallurgical invention, our paper examines the reasons behind the regional diffusion of the Basset method and the technopolitical significance of its appropriation, with particular attention to the Portuguese case. There, the method must be situated within the industrial policies of the Estado Novo; the contemporaneous debates over whether and how to establish steel production in a country without high furnaces; the role of the cement industry in the corporatist reconfiguration of the Portuguese state; and the coal shortages and political realignments during World War II.

Keywords: Basset method, metallurgy, cement industry, rotary kiln, France; Spain, Portugal, Estado Novo, circulation and appropriation of technology

THERE ARE SO MANY ANECDOTES: HOW MODEMS WRITE A MULTISCALE INTERNET HISTORY

Paloque-Bergès Camille

Laboratoire Histoire des Techno-Sciences en Société (HT2S), Conservatoire national des arts et métiers, Paris, France

camillepaloqueberges@gmail.com

“There are so many anecdotes,” sighed Teus Hagen, a central figure in the European organization of Unix, Usenet networks – early pathfinders of the global Internet (groundwork of a forthcoming book; Paloque-Bergès 2018) – when interviewed about the use of modems in establishing links in the 1980s. Two lines of inquiry are presented. First, I highlight the role of modems in an underground history of the Internet during that decade. Second, I examine the historiographical issues these anecdotes raise for writing the history of recent technologies. My multi-scalar perspective draws on microhistory, which I revisit in order to work both alongside and critically with oral history. Despite significant methodological advances that have enriched the field (e.g. the *Internet Histories* journal), the public history of digital networks remains largely structured around individual narratives elevated to landmark status within a canonical story beginning with the Arpanet (Hafner & Lyons 1999; Abbate 2000). The modem constitutes one such landmark, associated with the Web experience of the 1990s (Schafer 2018), more recently repositioned within popular histories of BBS (Driscoll 2022). For my part, I engage a corpus of a dozen anecdotes collected from network administrators concerning the use, modification, and reverse engineering of modems that proved crucial to the development of Internet in Europe in the 1980s. Rather than treating these accounts in isolation, I reinsert them into the technical, social, economic, legal, and even geopolitical contexts that shaped their definition and use. I trace their circulation across borders through the social networks of academic computer scientists, engineers, and industrial professionals, notably Unix user groups. Their storytelling as contraband artefacts – often framed as acts of resistance by actors against university administrations, national telecommunications policies, or profit-driven data-communications firms – is examined critically. This approach yields a global history of these technological objects (Hilaire-Pérez, Carnino & Lamy eds 2024) from the standpoint of infrastructure (Edwards, Bowker & Jackson 2009). Modems are thus removed from anecdotal storytelling that fuels mythology and nostalgia, and resituated within the material constraints and institutional negotiations that structured their use, as sociotechnical artefacts embedding technical cultures.

Keywords: modems, Unix, Usenet, Internet, microhistory, global history, infrastructures, materiality

TRAJECTORIES OF ATOMIC CLOCKS : ENGLAND, CANADA AND SWITZERLAND

Julien Gressot

Université de Neuchâtel

julien.gressot@unine.ch

In the mid-20th century, time measurement underwent a profound transformation: astronomical time, based on Earth's rotation, gradually gave way to atomic time. Innovations such as quartz clocks and Photographic Zenith Tubes (PZT) revealed the irregularity of Earth's rotation — a discovery that, far from being immediately accepted, provoked resistance and hesitation. Although atomic clocks, developed after World War II, promised unprecedented precision, their definitive adoption only occurred with the redefinition of the second in 1967.

This transition — often portrayed as a linear, inevitable progress — in fact unfolded amid disciplinary and institutional tensions. Astronomers, traditional custodians of time measurement, did not relinquish their role without contest: they actively pursued alternatives, notably by developing instruments such as the PZT. In 1960, the International Astronomical Union (IAU) redefined the second based on ephemeris time, derived from the tropical year of 1900 — an attempt to preserve the astronomical framework in the face of the rising dominance of atomic metrology.

Moreover, national metrology laboratories — the NPL (UK), NRC (Canada), and LSRH (Switzerland) — did not follow a uniform trajectory. Their development of primary cesium standards — the atom selected in 1967 to redefine the second — reflected distinct technical, political, and institutional logics specific to each country.

This paper proposes a comparative analysis of these three cases, combining photogrammetric methods (NRC), material and archival analysis (NPL), and iconographic and archival approaches (LSRH). Its aim is to illuminate the national, disciplinary, and material stakes that shaped the emergence of atomic standards — not as a mere technical advance, but as a moment of reconfiguration of knowledge, authority, and material practices in time measurement.

Keywords: Atomic clock, Time measurement, timekeeping, material culture

UNUSUAL REPAIR PRACTICES OF TELEPHONE TECHNICIANS

Stefan Krebs

Luxembourg Centre for Contemporary and Digital History, University of Luxembourg, Luxembourg

stefan.krebs@uni.lu

The paper examines everyday repair practices of telephone technicians in Luxembourg during the interwar period and argues that repair work often diverged from the rationalized procedures envisioned by management. Drawing on a rare set of archival sources from the Luxembourg Post and Telecommunications administration (PTT), the study analyzes circulars, directives, and administrative reports issued in the 1930s. Although these documents were intended to regulate and standardize technical work, they inadvertently reveal how repairers actually operated in the field. By reading managerial sources “against the grain,” the article reconstructs aspects of repair culture that are usually difficult to access in the historical record.

The paper situates these practices within the broader expansion of Luxembourg’s telephone network from the late nineteenth century to the interwar years. In response to the rapid growth of the telephone network, management introduced new administrative tools designed to rationalize maintenance and repair work, including detailed service instructions, standardized procedures, and extensive documentation practices. These measures aimed to improve oversight of materials, labor, and technical installations while imposing a more systematic form of control over workers’ activities. However, the circulars repeatedly complained about technicians ignoring or circumventing these new rules. Workers failed to complete forms, mismanaged spare parts, and carried out repairs that deviated from official guidelines. Rather than simply reflecting incompetence, such practices reveal the practical realities of repair work, which depended heavily on experience, improvisation, and situational judgment.

The paper argues that these “unusual” repair practices can be understood through the concept of “Eigen-Sinn”, developed in the historiography of everyday life. From this perspective, technicians’ deviations from prescribed procedures expressed a form of practical autonomy and collective work culture that resisted increasing bureaucratic control. At the same time, they reflected the inherently variable nature of maintenance work in complex technological systems. By highlighting the tensions between managerial rationalization and everyday technical practice, the paper contributes to the growing historiography of repair and maintenance and shows how the functioning of communication infrastructures depended not only on formal systems of control but also on the situated knowledge and agency of workers.

Keywords: history of repair, everyday history

URBAN ENERGY SUPPLY IN BUDAPEST IN PEACE AND WAR, 1890–1940.

Aliaksandr Piahnanau

Division of History of Science Technology and Environment, KTH Royal Institute of Technology, Stockholm, Sweden

piahnanau@kth.se

This paper uses the history of the Budapest Gas Works between 1890 and 1940 as a lens through which to explore the vulnerabilities and resilience of urban energy infrastructure in a fast growing Central European metropolis - Budapest. During this period, Budapest's population more than doubled — from 0,5 million in 1890 to 1.1 million by 1940 — while undergoing rapid industrialisation. Following the dissolution of the Austro-Hungarian Empire in 1918, Budapest became the capital of an independent Hungary, which further strengthened its political and economic significance. The Budapest growth was accompanied by a profound energy transition. Coal consumption, and particularly its by-products such as coal gas for heating, cooking and lighting, dramatically increased. Gas consumption rose from around 20 million cubic metres in 1890 to approximately 60 million cubic metres by 1910. Recognising the importance of energy provision, the municipality acquired five major local gas producers in 1910 and merged them into a unified public utility: the Budapest Gas Works (Gázművek). The company soon became one of the most influential municipal institutions, overseeing production, distribution and pricing. Its first director, Ferenc Ripka, played a pivotal role during the post-World War I crisis. Amidst the revolutionary upheavals of 1918–19 and the Romanian occupation of Budapest, he negotiated international coal supplies to ensure the city had coal and gas supply. After becoming mayor from 1924 to 1931, Ripka further expanded the municipal gas network. By examining the institutional evolution and crisis management strategies of the Gas Works, this paper shows how energy infrastructure became pivotal to Budapest's urban development.

Keywords: urban metabolism, fossil fuels, infrastructure planning, energy diplomacy

ROUNDTABLES

ORAL HISTORY BEYOND INTERVIEWS: PROMISES AND PITFALLS

Anna Åberg, Aron Ambrosiani, Nathalie Bergame, Saara Matala

Chalmers University of Technology

anna.aberg@chalmers.se

aron.ambrosiani@chalmers.se

bergame@chalmers.se

matala@chalmers.se

History cafes, collective biography writing, history walks, witness seminars and online memory collecting initiatives. These are some methods in the intersection of oral history and public history that have been used by us to create new, useful sources in the Swedish history of energy and history of computing.

In the proposed panel we describe these methods, discuss their possibilities, strengths and challenges and highlight how they differ from and complement traditional archival sources when researching contemporary history of technology.

History cafes are public events where participants are invited to share their experiences and memories. History walks follow a route where participants can collaboratively rediscover old memories of a place. Collective biography writing gathers a group of people with similar experiences to write a common history together. In the project Energy Lives! these formats are used to document and preserve the history of the oil refinery expansion in Gothenburg in the 1940s.

In witness seminars, influential actors are invited to discuss a specific project or process in front of an audience. The format was used in the project From Computing Machines to IT to establish a first-hand yet nuanced understanding of key events in the Swedish history of computing.

Online memory collecting initiatives aim to gather individual stories concerning a topic while simultaneously broadcasting its importance. When done in collaboration with a memory institution (such as a museum or archive) it can be an effective way to create additional sources for historical research. It is used in the PhD project Gendered computing occupations in Sweden to collect memories of women key punchers, an under-represented group in existing archival material.

Keywords: oral history, participatory feminist methods, public history, energy history, history of computing

HISPANOAMÉRICA EN LA HISTORIA GLOBAL DE LA TECNOLOGÍA: CONEXIONES, PERSPECTIVAS Y DESAFÍOS EN EL SIGLO XXI

Organizador y moderador:

Nelson Arellano-Escudero, Presidente ICOHTEC

Panelistas:

Rebeca De Gortari,

UNAM (México)

Darina Martikánová

Universidad Autónoma de Madrid (UAM) (España), Presidenta Jurado premio Turriano de ICOHTEC.

Marion Steiner

Presidenta Comité Internacional para la Conservación del Patrimonio Industrial (TICCHI).

Carlos Sanhueza

Universidad de Chile, Coordinador Laboratorio de la Historia de la Ciencia, Tecnología y Sociedad (LabHCTS, Chile)

Daniel Crespo

Fundación Juanelo Turriano, Universidad Complutense de Madrid

El congreso mundial ICOHTEC-SHOT 2024 en Viña del Mar fue una instancia de contribución regional latinoamericana a la discusión global de la historia de la tecnología. Después de 2 años algunos de sus efectos se están haciendo visibles en publicaciones y la realización de nuevas reuniones, además de una circulación de información en la que participan algunas agrupaciones tanto nacionales como transfronterizas.

Si bien es posible indicar que la historiografía de la tecnología en el mundo hispanohablante ha experimentado un crecimiento en las últimas décadas, con aportes clave desde España y América Latina, se sigue conviviendo en la fragmentación y lidiando con brechas en las narrativas eurocéntricas y/o coloniales-imperiales.

Una mesa redonda es esencial para comentar estas perspectivas dispersas, fomentar redes entre expertos iberoamericanos y europeos, y explorar agendas compartidas potencialmente colaborativas, promoviendo una historiografía inclusiva y relevante para debates contemporáneos sobre sostenibilidad y patrimonio en el Sur global.

Este panel será desarrollado en idioma español, pero queda abierta la posibilidad a realizar una traducción simultánea de acuerdo a las posibilidades y factibilidad de la organización. La participación será híbrida con panelistas en persona y a través de videollamada.

Keywords: Iberoamerica - historia de la tecnología - desafíos - futuro - conexiones

LATIN AMERICA IN THE GLOBAL HISTORY OF TECHNOLOGY: CONNECTIONS, PERSPECTIVES, AND CHALLENGES IN THE 21ST CENTURY

Organizer and Moderator:

Nelson Arellano-Escudero, President of ICOHTEC

president@icohtec.org

Panelists:

Rebeca De Gortari

UNAM (Mexico)

rebeca.degortari@gmail.com

Darina Martikánová

Autonomous University of Madrid (UAM) (Spain), President of the ICOHTEC Turriano Prize Jury

darina.martikanova@uam.es

Marion Steiner

President of the International Committee for the Conservation of Industrial Heritage (TICCHI)

patrimoniocritico@gmail.com

Carlos Sanhueza

University of Chile, Coordinator of the Laboratory for the History of Science, Technology and Society (LabHCTS, Chile)

carlos.sanhueza@uchile.cl

Daniel Crespo

Juanelo Turriano Foundation, Complutense University of Madrid

danielcrespo@juaneloturriano.com

The ICOHTEC-SHOT 2024 World Congress in Viña del Mar was a regional contribution from Latin America to the global discussion on the history of technology. Two years later, some of its effects are becoming visible in publications and the holding of new meetings, as well as the circulation of information involving both national and cross-border groups.

While it is fair to say that the historiography of technology in the Spanish-speaking world has experienced growth in recent decades, with key contributions from Spain and Latin America, it continues to grapple with fragmentation and gaps in Eurocentric and/or colonial-imperial narratives.

A roundtable discussion is essential to address these dispersed perspectives, foster networks between Ibero-American and European experts, and explore potentially collaborative shared agendas, promoting an inclusive and relevant historiography for contemporary debates on sustainability and heritage in the Global South.

This panel will be conducted in Spanish, but simultaneous translation may be provided depending on the organization's resources and feasibility. Participation will be hybrid, with panelists both in person and via video call.

Keywords: Ibero-America – history of technology – challenges – future – connections

PANELS

PANEL TITLE:

**MULTIDIMENSIONAL PRESENTATION OF MEDICAL HISTORY OF TECHNOLOGY:
THE ROLE OF MUSEUMS IN PRESERVATION, COMMUNICATION, AND CROSS-
CULTURAL DIALOGUE**

GLOBAL VISION AND LOCAL PRACTICE: A COMPARATIVE STUDY OF UROLOGICAL INSTRUMENT MUSEUMS IN THE WEST AND CHINA

Cheng Zhen

Professor of History of Medicine, Institute of Medical Humanities, Peking University, Chief Expert of the Academic Committee, China Alliance for the Development of Medical Museums, Principal Investigator of Beijing Social Science Fund Project on Medical Museums (No. 21LSA001), Principal Investigator of National Social Science Foundation Program on Medical Heritage (No. 22VJXT010)

zhencheng@bjmu.edu.cn

This study compares major urological instrument museums in Europe and America (eg. the William P. Didusch Center for Urologic History and Europe Museum of Urology with its partnered museums) with the Max Nitze Museum, Beijing, examining the pathways for preserving, displaying, and interpreting material heritage of medical technology under different cultural, institutional, and historical contexts. The research focuses on three core dimensions: 1) Collection logic and narrative structure: how Western museums construct narratives of “technological evolution” and “disciplinary development”, and how Chinese museums integrate discourses of “integrating traditional Chinese and Western medicine” and “local innovation”; 2) Public participation and educational function: the curatorial strategies and interactive methods employed by different museums for professional audiences and the general public; 3) Heritage activation and institutional sustainability: differences and challenges in funding sources, community collaboration, and digital transformation. Through comparison, this study aims to provide cross-cultural insights for the development of medical museums in China, promote interdisciplinary dialogue among the history of technology, museology, and medical humanities, and offer new perspectives for the protection and interpretation of medical cultural heritage in the context of globalization.

Keywords: History of Medicine, Museums, Cultural Heritage, Public Education, Cross-Cultural Comparison

IMMERSIVE COMMUNICATION OF TRADITIONAL CHINESE MEDICINE CULTURE: TECHNOLOGICAL EMPOWERMENT AND PUBLIC PARTICIPATION AT BEIJING UNIVERSITY OF CHINESE MEDICINE EXPERIENCE PAVILION

Shuo Zhang

Lecturer, Department of Public Foreign Languages, School of Humanities, Beijing University of Chinese Medicine
zs_bucm@163.com

Centered on immersive experiences, the Traditional Chinese Medicine Experience Hall at Beijing University of Chinese Medicine employs a three-dimensional “Perception - Experience - Understanding” design to reshape the public participation model of traditional cultural institutions. Using this hall as a case study, this report explores how it integrates physical exhibition, digital technology, and cross-media communication to facilitate the contemporary transformation of TCM culture.

The four floors of the Experience Hall break away from traditional static displays by transforming TCM theories into interactive scenarios. Technologies such as AR herb identification, meridian sensing, and tongue and pulse diagnosis simulators allow visitors to learn TCM knowledge and appreciate diagnostic wisdom through hands-on operation. Real-sense experiences like auricular acupuncture and moxibustion make abstract medical knowledge “embodied”, significantly lowering the cognitive barrier and highlighting the unique value of experiential spaces in knowledge transmission. Regarding public engagement, the Experience Hall actively builds a cross-media communication matrix. Through short videos, live streams, and collaborations with online games, it deeply embeds TCM culture into youth popular contexts, facilitating its breakthrough beyond traditional circles and achieving vibrant outreach. Simultaneously, by recruiting student volunteers through the university’s “International TCM Communication Association”, it establishes a sustainable ecosystem for on- and off-campus participation, making the hall a dual base for educational practice and talent cultivation. In cross-cultural communication, the Experience Hall also plays a key role. By organizing events like the “Dialogue with TCM” series, hosting the “10-Second TCM Experience Hall” for the Beijing Winter Olympics, and conducting international touring exhibitions such as “Chinese Language + TCM”, it effectively facilitates dialogue between local knowledge and global contexts, providing practical examples for reconciling cultural specificity with globalization. The TCM Experience Hall is not only a preserver of cultural heritage but also, through technology empowerment and participatory design, connects traditional medicine with the contemporary world. Its innovative approaches offer important references for the creative transformation and dissemination of local cultures in the context of globalization.

Keywords: History of Medicine, Museums, Cultural Heritage, Public Education, Cross-Cultural Comparison

EXHIBITING ANCIENT GREEK SCIENCE IN THE MUSEUM: NEW TECHNOLOGIES FOR HISTORICAL RECONSTRUCTION

Zheran Wang

Assistant Professor, Department of History of Science, and Assistant Curator, Science Museum, Tsinghua University

wzr@tsinghua.edu.cn

The Tsinghua University Science Museum is scheduled to open to the public in 2027, with its permanent exhibition structured around a global history of science narrative in which ancient Greek science occupies a central position. In 2025, the museum established the Laboratory for the Reconstruction of the History of Science, dedicated to using modern technologies to reconstruct historically significant scientific artifacts and to develop museum displays that combine scholarly rigor with public accessibility. This presentation examines how the museum integrates academic research and exhibition practice through three reconstruction projects related to ancient Greek science, guided by the concept of recreating history through new technology.

The first case focuses on the displaying of ancient Greek astronomical models. Using micro-motor technology, the laboratory developed a dynamic model of Eudoxus's homocentric spheres, enabling an intuitive visualization of the complex "hippopede" motion used to explain planetary movement. In the case of Ptolemy's planetary system, high-precision mechanical devices were employed to physically realize its sophisticated mathematical framework, including eccentric circles, epicycles and deferents, and the equant point. By integrating lasers and photosensitive materials, the exhibit visually demonstrates planetary retrograde motion, translating abstract mathematical astronomy into observable mechanical phenomena. The second case involves the architectural reconstruction of the Tower of the Winds in Athens using high-precision 3D printing technology. The project reproduces the building's external form and structural details, highlighting its function as a comprehensive timekeeping device that combined a sundial, water clock, and wind vane. Through the physical model, the exhibition conveys both the technical ingenuity and the cultural context of this iconic structure, illustrating how architectural reconstructions can effectively communicate complex scientific functions within their historical setting. The third case is the reconstruction of a playable ancient hydraulic organ. Combining traditional craftsmanship with modern precision techniques—such as woodworking, metalworking, and casting—the project is grounded in ancient textual sources and archaeological evidence. The reconstruction aims to faithfully reproduce the instrument's acoustic principles and musical effects, allowing visitors to audibly experience an aspect of ancient Greek scientific and artistic achievement.

In sum, these projects demonstrate an integrated approach to presenting the history of science in museums. Object-based reconstruction serves as a methodological bridge between scholarly research and public interpretation, transforming specialized knowledge into tangible, operable exhibits. By engaging multiple senses and emphasizing experiential learning, these reconstructions enhance public understanding of ancient scientific thought and underscore its continuing relevance in contemporary culture.

Keywords: History of Medicine, Museums, Cultural Heritage, Public Education, Cross-Cultural Comparison

A NEW WAY OF MAKING: HISTORICAL MODEL MAKING AND THE USE OF 3D PRINTING AT THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY (OUMNH)

Jemima Dunnett

Gardens, Libraries and Museums, Oxford University, UK

jemima.dunnett@oum.ox.ac.uk

In 1968, the art historian E. H. Gombrich wrote in his article *Should a Museum Be Active?* that "technological progress and social mobility are transforming the world. Those that cannot keep up with the pace may go under." Over half a century later, the pace of technological change has only increased, and the pressure on museums to embrace the opportunities of the digital age has intensified. Since the turn of the century, 3D printing has been part of this transformation. Championed as a "revolutionary tool" (Cooper, C. 2019; Ogundipe, A. 2023), its application in museums has given rise to a wealth of discussion concerning the democratisation of data, the rematerialisation of artefacts, and new forms of public engagement that emerged from the ideologies surrounding the Maker Movement. As 3D printing continues to be used by museums, it is necessary to consider how the technology can be integrated in ways that are both sustainable and meaningful. This summary discusses the contemporary use of 3D printing at the OUMNH and situates it within the institution's established history of model making for public display. Specific parallels are drawn between the innovative use of 3D printing in current installations and the didactic models produced in the museum at the turn of the twentieth century. These two periods employ new techniques to create models for pedagogical purposes, documenting not only how new technologies are incorporated into museum displays but also how they reflect the museum's pedagogical practices, including those relating to the environment and ecology. As advocated by Bennett (1995), this technological history explores not only a theoretical framework but also an understanding of the "technical forms" (Bennett, 1995, 24) that shape the visitor experience.

Keywords: 3D Printing, Oxford Museum of Natural History, History of Technology, Museum User Evaluation

PANEL TITLE:

**ENERGY, TECHNOLOGY, AND THE ENVIRONMENT: CONFLICT OR
COMPATIBILITY**

SCIENCE-ENGINEERING OF WATER PURIFICATION FROM ANCIENT TIMES TO PRESENT

Anthony N. Stranges

Professor, Texas A&M University, College Station, TX, USA

a-stranges@tamu.edu

This paper examines the science-engineering of water purification dating from ancient times and resulting in the introduction and development of water distribution systems having pumping stations and underground pipes to bring water from nearby rivers, lakes, or bays into the cities, and underground sewer systems to carry the sewage and other waste from the cities into the rivers, lakes, or bays far from the pumping stations; coagulation; slow sand and rapid sand filters; and chlorination in the 1800s-1900s. Air and sunlight (aeration) decomposed some of the undissolved solids in the polluted water. These technological advances provided clean and disease-free (bacteria, viruses, and pathogens) water sources.

Keywords: Energy, Technology, and the Environment

TECH INNOVATION AND MULTIDISCIPLINARITY FOR ENERGY-ENVIRONMENT NEXUS IMPROVEMENT

Elena Helerea

Professor, Transilvania University of Brasov, Romania

helerea@unitbv.ro

This paper examines the growing scientific movement that investigates the complex and interconnected relationship between energy and the environment, namely the growth of the world's population and the intensification of urbanization and industrialization. They have led to an increase in the consumption of energy obtained with different technologies and have had a dramatic effect on environmental degradation, visible through three main problems of environmental pollution, biodiversity loss and climate change. Models of the energy-environment interrelationship, defined as the Energy-Environment Nexus, have been developed, with the aim of stimulating technological innovation in the field of clean energy to reduce any negative impact on the environment.

Keywords: Energy, Technology, and the Environment

SWEDEN'S FORESTS - A SUSTAINABLE STORY?

Petter Wulff

independent scholar, Sweden

petterwulff@gmail.com

This paper examines Sweden's reliance on forests to function as carbon sinks and as habitats sustaining biological diversity that has resulted in Sweden's successful history of combining use and sustainability. Swedish forests have been the base of industrial activity since the 1600s providing charcoal to the iron industry and timber and pulp in the 1800s. But forests have more roles to play, and in the last decades their sustainability has emerged as an issue. One challenge is climate change. Sweden's forests function as carbon sinks and remain habitats sustaining biological diversity. Faced with the present climate and biology challenges, what could Sweden learn from its successful history of combining industrial use and sustainability?

Keywords: Energy, Technology, and the Environment

FUELING THE CAPITAL: A TRANSNATIONAL ENERGY HISTORY OF STOCKHOLM

Per Högselius

KTH Royal Institute of Technology

perho@kth.se

This paper explores Stockholm's energy history. The Swedish capital city traditionally relied on nearby firewood as its main source of fuel. Early industrial steam engines, railway transport and town gas ushered in a gradual transition to fossil fuels. Since Sweden had virtually no domestic coal resources, the new fuel had to be imported. The resulting transnational entanglements were of pervasive importance for urban life in Stockholm up to the 1950s. Seeking to strengthen urban energy security, the municipal gasworks, one of Europe's largest, became active in international business negotiations, while also engaging in energy diplomacy with Britain, Germany, Poland and the United States. Pursuing what we may think of as internal Swedish hydro-colonialism, Stockholm also acquired several waterfalls in the mighty Dalälven River, 150 km to the north of the city and signed electricity import agreements with Norwegian hydropower actors. Meanwhile the consumption of fossil fuels continued to increase and was further diversified through imports of crude oil and refined oil products from distant lands. Seeking to replace coal and oil with nuclear energy in (district) heating, Stockholm commissioned the local Ågesta nuclear heat and power plant in 1964. More important, on the longer term, was the capital's acquisition of stakes in larger, non-urban nuclear power plants that ran on African and Australian uranium. Eventually Stockholm saw a return to the forest as a key energy source as local heat and power plants switched from coal and oil to biomass from northern Sweden as their main fuel.

Keywords: Stockholm, energy, fossil fuels, nuclear, hydropower

PANEL TITLE:

**WHOSE SIGNAL, WHOSE STORY? DECOLONIALITY AND THE CURATION OF
TECHNOLOGICAL COMMUNICATION HISTORIES**

CONNECTED HISTORIES, THE TELEGRAPH IN NIGERIA

Nnamdi Nnake

PhD Candidate in History and SSHRC Doctoral Fellow McMaster University

nnaken@mcmaster.ca

This paper discusses the interdisciplinary imbrications of an exhibition I curated at the McMaster Museum of Arts in collaboration with Ingenium, Canada's National Museums of Science and Innovation and Northwestern University Library. Titled Connected Histories, the exhibition offers visitors various viewpoints of the telegraph in Nigeria, an important means of communications that is largely overlooked in public and academic histories. Through real telegraph artifacts, practice sets and large-format images, the exhibition combines physical and digital interactions to promote public participatory research and intergenerational dialogue. The paper illustrates how visual analysis, as Cindy Ott (2021) describes, provides an excellent tool for interdisciplinary and multilayered perspectives of technology in society. Instructors for example, may adopt such approaches as a component of undergraduate course work in a variety of fields. Cognizant of the infrastructural turn in the histories of science, technology, culture and the environment, as well as in media and communication studies amongst others, this paper argues for wider adoption of visual analysis as a research methodology for scholarly and public engagements with histories of science and technology.

Keywords: Infrastructure, Communications, Technology History, Visual Analysis, Material Culture

COLD HISTORIES OF HOT WARS: RESEARCHING COOLING TECHNOLOGIES AND US POWER IN THE TWENTIETH CENTURY

Sebastian James Rose

Universität Duisburg-Essen, Kulturwissenschaftliches Institut Essen (KWI)

Sebastian.rose@kwi-nrw.de

In the groundbreaking book *Media Hot & Cold*, media scholar Nicole Starosielski draws connections between media and temperature by outlining the ways that hot and cold have been utilised as mediums and means for communication and control. Focusing on ‘thermopower’, Starosielski argues that temperature has become embedded in modern media systems. Similarly, the study of cryocultures focuses on the rise, use and conceptualisation of technologies and ideologies of the cold, from air-conditioning and temperature calibration to global cold chains and the emergence of “freshness”. Absent from these discussions is the role of hot and cold in the conduct and imaginary of modern warfare. Yet war, like media, is intricately connected to the development and use of cooling technologies. From AC in US bases to blood chains, refrigeration of food stuffs and the use of incendiary weaponry, manipulation of temperature was central to strategies of the American hot wars of the Cold War period waged in the global south. This paper explores how technologies of cooling were fundamental to US warfare during the Cold War and discusses methods and methodologies for exploring and thinking about cryotechnologies and war. Focusing on the Vietnam conflict, the paper examines how something as ephemeral as hot and cold might be historicised and communicated through texts, images, videos, maps and senses. It asks what a history of cryocultures, war and media might tell us about the US power during the Cold War and its conduct of battle in the twentieth century. It argues that as we enter an era of renewed militarism, extreme forms of man-made climate change and the proliferation of a ‘hot’ and burgeoning media system dependent on cooling technology, the need to trace the historic connections between warfare, technologies of cooling and media have become even more pressing.

Keywords: Cryocultures, cooling, Cold War, US Empire, Vietnam

COLONIAL DISCOMFORT AND THE CORPORATE ARCHIVE: CURATING INDIA ON THE LINE AT THE BT ARCHIVES

Shibani Das

PhD Candidate in History of Technology | Founder, Researcher's Wellbeing Through Art

Exeter University

sd720@exeter.ac.uk

Corporate museum and archives occupy an underexamined position in debates on decolonial practice. Insulated from the public accountability that state institutions increasingly face, yet deeply implicated in the histories they document, they present distinctive challenges for scholars seeking to produce historically responsible, representative narratives of colonial infrastructure. This paper presents a case study of *India on the Line: Communicating in Colonial India (IOTL)*, an exhibition on the everyday lives of employees in the Indian Telegraph Department between 1920 and 1947, curated and exhibited in 2025.

Drawing on Anna Vestergaard Jørgensen's concept of 'colonial discomfort', the paper examines the structural and affective obstacles to decolonial curatorial practice within a corporate institution. It traces the epistemic violence embedded in colonial archival design, from keyword architectures that render subaltern telegraph workers systematically invisible, to the institutional inertia that reproduces what Ann Stoler terms 'imperial dispositions' and asks how an exhibition can recover non-elite Indian voices from archives expressly designed to suppress them.

The paper argues that non-textual sources, such as photographs, material artefacts, popular ephemera, and staff magazines, were not supplementary but constitutive of the exhibition's methodology. Where official records documented the colonial gaze, critical fabulations, visual and material culture offered oblique, recoverable traces of subaltern experience. In foregrounding this methodological turn, the paper situates *IOTL* within a broader historiographical shift towards bottom-up social histories of colonial communications technology. It reflects critically on the practical limits of decolonial praxis when the archive itself functions as an organ of corporate authority.

Keywords: Infrastructure, Communications, Material Culture, Decolonial Praxis, Cultural History

SATELLITE TELEVISION AND THE PROJECT TO CREATE A ‘SCIENTIFIC TEMPER’ IN POST-COLONIAL INDIA

Aparajith Ramnath

Ahmedabad University

apconf@gmail.com

A key element of state ideology in post-colonial India was what Jawaharlal Nehru, the nation’s first prime minister, famously called the ‘scientific temper’. Communications technology—especially satellite television—was central to efforts by the state and the Indian intelligentsia to create a citizenry with a secular and rational worldview. Yet this dimension of television in India has been understudied (major studies of television and society have focused on a different outcome, namely the rise of neoliberalism and Hindu majoritarianism).

In this paper I propose to draw on the career of a pioneering documentary filmmaker, Chandita Mukherjee (1952-2023), to explore how Indian intellectuals and policymakers used satellite TV as a medium to promote a science-centred worldview. Over several decades, Mukherjee played a leading role in these efforts. At the start of her career in the 1970s, she participated in the Satellite Instructional Television Experiment (SITE), which beamed educational programmes to thousands of Indian villages via an American satellite. In the 1980s, she helmed *Bharat ki Chhaap*, a landmark TV series that showcased the place of science and technology in India’s longue durée history without veering into a glorification of the past for its own sake. In the 2000s, Mukherjee was closely involved in efforts to establish a TV channel devoted to science that would be broadcast via a newly launched Indian satellite, EDUSAT.

Through a study of Mukherjee’s papers (recently archived at the National Centre for Biological Sciences, Bengaluru) alongside other archival sources, government reports, and contemporary newspaper accounts, this study aims to illuminate the decisions and debates that various stakeholders engaged in while producing various forms of science communication. In particular, it will explore how the nature of satellite TV—the possibilities and the constraints inherent in the technological medium—shaped the ways in which the project of creating a scientific temper was approached.

Keywords: satellite television, communication technology, science communication, education, post-colonial, India

“THE HISTORY OF THE METALLURGIC ARTS IS INVOLVED IN THE HISTORY OF THE CIVILISATION OF MAN”: METALLURGICAL TECHNOLOGIES AND COLONIAL ANTHROPOLOGY IN THE NINETEENTH CENTURY

Anaïs Walsdorf

University of Warwick and the Science Museum, London

Anaïs.Walsdorf@warwick.ac.uk

As European anthropologists and scientists embarked on colonial expeditions in the nineteenth century, they observed and collected. Because most societies practice metallurgy, metallurgical processes and technologies were often a subject of anthropological inquiry.

Furnaces and bellows represent the basic technological elements of iron-smelting societies. Bellows are used to increase airflow into furnaces, precipitating the chemical reactions that produce more intense combustion and higher temperatures. They can be made of a variety of materials and come in many different designs, but their purpose is always the same: to deliver a continuous blast of air into a fire to keep the temperature high enough for metallurgical processes. Crucially, they are often the most portable technological aspect of a metallurgical operation, as they are typically made of wood and animal skin. On the other hand, furnaces are heavy, with larger facilitating increased production capacity. In many cases, they are constructed out of organic materials such as clay and brick. For this reason, bellows were the most common metallurgical technology collected and deposited into museums by imperial agents, while information about furnaces tend to reside in written observations and technical drawings.

By focussing on bellows and furnaces as objects of anthropological inquiry, this paper will investigate the deep ties between empire, anthropology, and the development of the science of metallurgy in the mid-late nineteenth century. In order to tell this story, the paper will focus on the work of the ‘father of English metallurgy’ John Percy. Analysing Percy’s collection of specimens, correspondence, and work reveals how European racial theories of linear civilizational progress entered his renowned textbooks on metallurgy. Because Percy is credited as being one of the leading figures in making metallurgy scientific in the nineteenth century, the significance of racist anthropological theories in his scientific publications reveals the entangled nature of metallurgy and empire.

Keywords: metallurgy, empire, anthropology, collecting, classification

PANEL TITLE:

**RITUALIZING MOBILITY: TRANSPORT INFRASTRUCTURE, INAUGURATION
CEREMONIES, AND THE POLITICS OF MEMORY**

RITUALIZING THE MOTORWAY: INAUGURATION CEREMONIES AND THE CHANGING MEANING OF ROAD INFRASTRUCTURE IN CZECHOSLOVAKIA, 1930S–1980S

Michal Durco

Slovak Academy of Sciences, Institute of History

michal.durco@savba.sk

The motorway project in Czechoslovakia began in 1935 as a direct response to the rapidly expanding Autobahn network in neighbouring Nazi Germany. From the outset, however, the motorway was more than just a technical solution for mobility: it served as a symbolic promise of modernisation, state capacity, and political direction. This paper explores how the significance of the motorway in Czechoslovakia changed between the 1930s and the 1980s, emphasising how political regimes used motorway construction and inauguration as performative acts to establish legitimacy and inspire collective imagination. Drawing on the history of technology and approaches from memory studies, the paper traces three key phases: interwar planning during the First Republic, wartime construction under Nazi occupation (1939–1942), and the renewed socialist motorway programme beginning in the 1960s. Particular attention is paid to ceremonial moments—groundbreakings, official openings, and highly publicised events such as the 1971 World Road Congress in Prague— which framed motorway sections as visible evidence of progress and national achievement. These inaugurations transformed infrastructure into a stage for political choreography, embedding roads into broader narratives of state authority and future-oriented development. By comparing discourse and actors across regimes, the paper argues that the motorway’s meaning was repeatedly reconfigured: from democratic modernization project, to occupation-controlled strategic infrastructure, to socialist symbol of development and unity. In this way, the motorway became a contested “memoryscape” in which technological continuity masked profound political and ideological change. Ultimately, the study demonstrates how large transport infrastructures acquire cultural significance not only through their use, but through rituals that mark their construction, completion, and incorporation into collective memory.

Keywords: transport infrastructure, history of technology, memory studies, opening ceremonies, inauguration, large technological systems, modernization

THE INAUGURATION CEREMONIES OF HIGHWAYS IN SOCIALIST BULGARIA AND YUGOSLAVIA.

Lyubomir Pozharliev

Bulgarian Academy of Sciences, Institute of Philosophy and Sociology

lyubomir.pozharliev@uni-leipzig.de

The paper examines the symbolic meaning attributed to roads and highways in socialist Bulgaria and Yugoslavia through their opening ceremonies. In both countries, the opening ceremonies of roads were of great significance, as the road and the highway were a symbol of the path to socialism, guided by the Party leader – Marshal Tito Todor Zhivkov. This study analyses three types of opening ceremony: the ribbon-cutting, the groundbreaking and the inspection ceremonies. The meaning of these ceremonies is associated with different attitudes to time. The “groundbreaking” ceremony, a practice that has gained significant popularity in Bulgaria, signified the commencement of a project. The “ribbon cutting” is a term used to denote an opening ceremony, signifying the conclusion of a specific event or project. The former was future oriented, while the latter reflected and represented what had been done in the past. Inspection ceremonies, a hallmark of Yugoslavia, placed significant emphasis on the concepts of control, discipline, and responsibility. In contrast, contemporary inspection ceremonies exhibited a marked secular character. In contrast, the inaugural ceremonies in Bulgaria incorporated customary pagan practices, namely the act of pouring water from a copper vessel, partaking in bread accompanied by salt, and the execution of the traditional dance, known as the horo, which symbolises national unity. The magic of the rituals should have convinced the Bulgarians that they – united as a nation, follow the only right way - the road to communism.

Keywords: Opening ceremonies, ribbon cutting, groundbreaking, inspection ceremonies, roads, highways, socialist Bulgaria, socialist Yugoslavia

BLESS THE GAS! VÍTKOVICE IRONWORKS AS A PIONEER IN THE GASIFICATION OF AUTOMOTIVE TRANSPORT (UNTIL 1945)

Aleš Zářícký, Michaela Závodná

University of Ostrava

ales.zaricky@osu.cz

Whilst the history of automotive industry is predominantly associated with liquid hydrocarbon fuels obtained by refining crude oil, the first attempts to use gas as an alternative fuel date back to the 19th century. Initial efforts to substitute diesel and gasoline with alternative fuels such as coal gas, natural gas, propane-butane, and hydrogen were primarily driven by economic considerations. However, these endeavours laid the foundation for the current trend of environmentally sustainable automotive transport. The Vítkovice mining and metallurgical company played a significant role in these efforts. At the conclusion of the Habsburg Monarchy and the establishment of the First Czechoslovak Republic, it represented the most significant industrial acquisition of the Rothschild and Gutmann banking houses of Vienna on a global scale. The foundations for an experimental programme to utilise gas as a power source for various devices, and subsequently for automobiles, were established in the early 1890s when the Vítkovice Ironworks initiated the production of seamless pipes. These pipes are an essential semi-finished product in the fabrication of gas cylinders. Presently, Vítkovice a. s. stands as the preeminent global manufacturer of this product, while concurrently spearheading the promotion of hydrogen as a fuel of choice. The contribution will focus on the application of technology in an experimental programme for the use of gas, using the example of a specific international company.

Keywords: gas, automotive, habsburg monarchy, Czechoslovakia, Vítkovice ironworks, technology

DRIVING GROWTH AND DEVELOPING ROADS: TRANSPORT ECONOMICS AND THE GLOBAL CIRCULATION OF AUTOMOTIVE INFRASTRUCTURE IDEAS, 1950-1970

Henk Jan Dekker

Department of History, Bielefeld University, Bielefeld, Germany

henk-jan.dekker@uni-bielefeld.de

In the 1950s and 1960s, international organizations like the World Bank, United Nations agencies, the OECD, and the road association PIARC became powerful advocates for highway construction and automotive infrastructure as drivers of economic development. Around the same time, transport economics was institutionalized as a field and informed policymaking with increasingly sophisticated analysis. This paper examines how transport economics provided intellectual legitimacy for road-building programs in both the industrialized Global North and the developing Global South. It argues that the transport sector is understudied, both as an important dimension of Cold War development thinking and as a driving force in history of mobility. The central goal of the paper is to study how ideas and tools circulated between transnational organizations, national planning agencies, and local realities. As such, this paper connects to infrastructure studies in history of technology, as well as contributing to histories of development economics and Cold War knowledge circulation. Drawing on sources from a variety of geographical contexts, this paper traces how economic analytical tools such as cost-benefit analysis circulated through transnational expert networks and technical assistance programs. International organizations promoted highways as markers of modernization and economic progress, deploying similar economic justifications across different contexts. The paper is guided by three key questions. First, how did transport economists justify highway investment as a developmental priority in the 1950s and 1960s? Second, how were cost-benefit methodologies and other analytical tools adapted when applied to Global South contexts? Third, how did economists and planners from Africa and Latin America engage with, contest, or modify these frameworks? By comparing the economic reasoning deployed in various Cold War contexts, this paper demonstrates how transport economics functioned as a technology of legitimization that naturalized automobility as synonymous with development. Its aim is to study both the hegemonic power of Western economic expertise and the spaces where alternative voices challenged or reshaped dominant paradigms. This history illuminates how economic ideas, circulating through Cold War institutional networks, produced material landscapes that continue to foster increasingly unsustainable global mobility patterns today.

Keywords: Transport Economics, Cold War, Infrastructure Development, Automobility

JIM CROW AT HOME AND NEO-COLONIALISM OVERSEAS: THE “UNFORGIVABLE BLACKNESS” OF AFRICAN AMERICAN COMMERCIAL PILOTS, 1945-1964

Alan Meyer

Auburn University, Auburn, Alabama, United States

adm0027@auburn.edu

Nearly 1,000 African American men earned their wings at Tuskegee Army Airfield during World War II. Yet thanks to Jim Crow racism, when they sought civilian flying jobs after the war, airlines responded: “We don’t hire Negroes here.” Most former Tuskegee Airmen gave up and pursued non-aviation careers. But a handful left the United States to seek work overseas, where nascent national airlines faced a shortage of experienced local nationals to fill the pilot’s seat.

Some found success abroad before returning home when racist hiring practices began to ease. Perry Young shuttled passengers across the Dutch Caribbean for KLM airlines before he was hired by a New York City helicopter service. August “Auggie” Martin flew for Israel’s fledgling El Al before finally landing a job with U.S.-based air cargo carrier Seaboard World Airlines. And James Plinton operated a British-licensed flying service in Jamaica before becoming the first Black executive for a major U.S. airline when he was hired by TWA in 1957.

Yet not every African American pilot who went overseas successfully navigated the obstacles of “unforgivable Blackness,” a term civil rights activist W.E.B. Du Bois ruefully coined in 1914 to describe how a white majority American society responded to African Americans who pushed the boundaries of success too far. For instance, Wendell Levister became a local folk hero in Honduras, sometimes emerging from the cockpit dressed as a cowboy “complete with ten-gallon hat, boots, spurs and six-gun” to the delight of onlookers. But when his employer was bought out by a rival, Levister bitterly recalled how white expatriate pilots convinced the new owners to not hire him because he was Black. Levister summed up the situation succinctly: “Everywhere the American white man goes, he brings prejudice with him.”

This paper examines the policies and practices of exclusion that forced these pilots to leave their home country, the international dynamics of decolonization that allowed them to find work flying overseas, and the tactics they employed—with varying degrees of success—to overcome the obstacle of their “Unforgivable Blackness” to regain access to a high-tech, high-prestige career in commercial aviation.

Keywords: Social History, Aviation, Race, U.S. History, Global South, Decolonialization

PANEL TITLE:

**TECHNOLOGY, EVERYDAY LIFE, AND PRIVATE INITIATIVE IN THE LATE SOVIET
UNION**

BIKE AND WORK IN UKRAINIAN VILLAGES DURING THE LATE SOVIET PERIOD

Olha Martynyuk

University of Basel

olha.martynyuk@unibas.ch

The presentation examines the double invisibility of labor in rural Ukraine during the late Soviet period and the bicycle mobility that accompanied it. Official discourse portrayed the Soviet village as rapidly modernizing, with mass consumer goods widely available to kolkhoz workers. By the 1980s, bicycles had indeed become widespread in rural areas. However, in the press and popular culture they appeared mainly as leisure items associated with hobby sportsmen or urban youth rather than as practical tools for agricultural work. Meanwhile, labor on collective farms in the 1960s–1980s remained physically demanding and poorly paid (Bodnar 2010; Konstantinova 2012).

Drawing on archival documents, popular literature, and ethnographic studies, the paper confirms findings from parallel case studies of rural cycling: the bicycle served as an efficient tool for meeting everyday needs, procuring goods, expanding social and business networks, and romantic matchmaking (Männistö-Funk 2010, 2011; Njogu Morgan; Oldenziel et al., 2025). At the same time, it offers new insights into unofficial income-generating practices in the Soviet countryside and contributes to broader debates on rural mobility worldwide.

In rural economies of the 1960s–1980s, where in-kind exchange prevailed, purchasing a relatively expensive bicycle required long-term savings and the conversion of agricultural goods into cash. Once acquired, the bicycle could itself generate additional income in cash. The common preference for large, sturdy men's bicycles with diamond frames was shaped less by riders' bodily characteristics than by the tasks these bicycles were expected to perform. Capable of carrying loads of up to 180 kilograms, they significantly expanded users' capacity to transport produce, fodder, hay, construction materials, and even passengers. Child labor, omnipresent in the villages, was likewise facilitated by bicycle use; bicycles were often presented to children as "gifts," while simultaneously integrating them into productive labor.

While highlighting the gap between urban and rural consumption through the case of the bicycle, the paper nevertheless explores the interconnections between these economically and culturally distant worlds. Drawing on individual and family biographies, it demonstrates that the economic benefits of rural bicycle mobility extended far beyond the village.

Keywords: Bicycle mobility, Soviet Ukraine, Everyday life, gender, transport history.

NORMALIZING PRIVATE LIFE: VERNACULAR PHOTOGRAPHY IN SOVIET UKRAINE

Gennadii Kazakevych

Prof. Dr. Taras Shevchenko Kyiv National University of Ukraine

kazakevych@knu.ua

This paper examines vernacular photography in Soviet Ukraine as a social practice shaped by the adaptation of photographic technology to everyday needs that often diverged from the ideological objectives of the Soviet state. Drawing on methods of social anthropology and original fieldwork conducted in Ukraine in 2025, the study analyzes private photographic archives, family albums, and oral testimonies in order to reconstruct the social contexts of amateur photographic production, circulation, and consumption.

The paper argues that despite repeated attempts by Soviet cultural administrators to channel amateur photography into ideologically acceptable forms – through clubs, exhibitions, and specialized periodicals – vernacular photographic practices largely developed outside official frameworks. Family portraits, images of leisure, travel, festive gatherings, and material symbols of social status dominated private archives, while explicitly ideological themes remained marginal and episodic. In this sense, photography functioned as a means of normalizing private life and creating a visual alternative to official representations of Soviet reality.

Special attention is paid to the material and technological conditions of photographic practice. The limited availability of color photography, the labor-intensive nature of black-and-white film processing, and the domestic organization of photographic labor produced informal hierarchies of expertise and reinforced gendered patterns of access to technology. Photography also operated as a ritualized practice of memory: the collective viewing of family albums fostered shared narratives, emotional bonds, and a sense of continuity across generations.

By situating Soviet Ukrainian vernacular photography within a broader comparative perspective informed by Pierre Bourdieu's concept of photography as a "middle-brow art," the paper demonstrates the remarkable continuity of everyday photographic practices across political regimes. Ultimately, it suggests that by adapting photographic technology to their own social needs, Soviet citizens effectively detached personal memory from ideological control—at least at the level of private visual experience.

Keywords: photography, Ukraine, Soviet, amateur, camera

LIVING COMFORT LIFE. HOUSEHOLD APPLIANCES AND THEIR IMPACT ON SHAPING INDIVIDUALISM IN LATE SOCIALISM

Marta Studenna-Skrukwa

Dr., Adam Mickiewicz University in Poznań, Poland

marta.studenna@amu.edu.pl

The late socialist period in the Soviet Union was a time of intensive large-scale housing construction, with millions of people moving into new flats, and consequently, a huge interest in modern household appliances and audio/video equipment. At the same time, it was a period of interesting changes in the systemic approach to the concept of refitting a flat. In the previous era, there was a strong belief that the modernization of the household would occur rapidly, i.e., that in the performance of various household tasks, humans (more precisely, women) would soon be replaced by multi-tasking robots. This was a consequence of the belief that the development of space technology, in which the Soviet Union sought to take the lead, would yield highly innovative solutions in the civilian economy. Moreover, it also stemmed from Khrushchev's logic, according to which the primary economic goal of the USSR was to surpass the USA, not only in terms of quantitative production indicators, but also in terms of creative solutions. A particular impetus for technological creativity was provided by the American National Exhibition presented in Moscow's Sokolniki in 1959, where Whirlpool presented its famous 'Miracle Kitchen' project.

During the Brezhnev era, such a holistic shift was no longer expected. However, basic (from today's point of view) household appliances and audio/video equipment began to be treated as standard furnishings for a flat. The must-haves included a washing machine, refrigerator, television, transistor radio, and, among smaller accessories, a meat grinder. In late socialism, the discourse on the collective purchase of household appliances, such as those by residents of several flats on the same floor, which had been promoted a few years earlier under Khrushchev, also disappeared. The authorities clearly promoted individual consumption on many levels, including in the area of home furnishings.

In my presentation, I will attempt to find answers to the following research questions: To what extent did the shift towards individual consumption of household technology signify the decline of collectivist values and practices? As well as, what were the underlying reasons for abandoning utopian visions of multi-tasking robots in favour of human-operated devices?

Keywords: the Soviet Union, home, kitchen, household appliances, family.

ESTONIAN SHALE OIL TECHNOLOGIES AND THE BIRTH OF SHALE OIL INDUSTRY IN THE SOVIET UNION

Erki Tammiksaar

Tartu University, Estonian University of Life Sciences

erki.tammiksaar@emu.ee

Major societal shocks, such as the World Wars, have played an important role in consolidating socio-technical systems. During World War I, oil shale mining began in Estonia to supply St. Petersburg with an alternative combustible to coal. In 1920, the Republic of Estonia initiated the development low-temperature distillation for shale oil production. By the mid-1930s, this activity had become a profitable industry, particularly after Nazi Germany began purchasing Estonian shale oil as fuel for its navy.

During the 1920s – and especially the 1930s – Estonian shale oil production technologies attracted considerable international interest, both within Europe and beyond, including in Brazil and China. At the time, three shale oil production technologies were in use in Estonia: vertical retorts developed in Germany, horizontal retorts of Scottish origin, and horizontal tunnel retorts – a technology developed in Estonia by Russian émigré engineers in cooperation with Baltic German engineers.

Estonian shale oil factories did not treat these technologies as trade secrets. As a result, in the late 1920s and early 1930s, engineers from several countries, including Bulgaria and Romania, visited Estonian facilities. A particularly large number of visitors came from the Soviet Union. Estonian shale oil technologies were subsequently transferred there, first to Slantsy and later to Kashpirsk on the Volga River. Drawing on Estonian expertise, an oil shale-based chemical industry emerged in the Soviet Union. The article argues that this early technological transfer was a key factor in sustaining the development of oil shale processing after World War II in a state otherwise oriented toward petroleum-based petrochemistry.

Keywords: shale oil producing, technology circulation, Russia, Estonia

PANEL TITLE:

**SPECIAL SESSION ON BART HACKER AND THE SOCIAL HISTORY OF MILITARY
TECHNOLOGY**

BART HACKER AND THE SOCIAL HISTORY OF MILITARY TECHNOLOGY: CASE STUDY COMPARISON OF THE PRE-1914 PERIOD, THE INTERWAR (1919-1939) AND THE UKRAINE- RUSSIAN WAR

David Zimmerman

Department of History, University of Victoria

dzimmerm@uvic.ca

Nothing is more predictable than the uncertainty of predictions about military technology in times of rapid technological change. In periods leading up to great conflicts military experts are certain they know how a future war will unfold, which technologies, and military systems will prove decisive. Yet, the very factors that Bart Hacker explored in his seminal article, “Military Institutions, Weapons, and Social Change: Toward a New History of Military”, are what determines why these “experts” are usually wrong. Military historians tend to selectively cherry pick the thinkers and the parts of their theories that appear to have been far-sighted, accurate prophets of a future conflict. Yet a closer examination reveals that most of these “intellectuals” got more wrong than right. War has a funny way of not following rules or precognitive visions; social, cultural, institutional factors, as well as the often-misunderstood nature of new technologies shapes the real battlefield. This paper will explore this about the lead up the two world wars and the Ukrainian Russian War.

Keywords: Russo-Ukrainian War, First World War, Bart Hacker, Social History of Military Technology

ETHICS AND COMBAT DRONES TECHNOLOGICAL MOMENTUM

Yoel Bergman

Associate researcher in the Cohen Institute for history of science, Tel-Aviv University. ICOHTEC member.

yoelb062@gmail.com

The use of drones for military surveillance in the Vietnamese War is thought to be the first appearance of modern combat drones. By the 1980s, killer-hunter (“loitering”) drones were introduced and used by the US against militants following 9/11. It soon led to casualties with uninvolved civilians. Attempting to reduce such risks, a civilian request was filed in a US court in 2010 for transparency, leading to government restrictions but without a substantial ban. Understanding such limited success can be helped by Thomas Hughes’s theoretical model of technological progress: The general public can influence development yet it can do little in the final “momentum” phase, where systems have proven their necessity. In the case of the drones, the criticism was highly visible after 9/11 already at the momentum phase and less during development. The progression of combat drones will also be examined through Bart Hacker’s favoured Social History of Military Technology (SHMT), which examines the reciprocal relationship between warfare, military technology and institutions, and society.

Keywords: Drones, Hughes, Hacker, Public Criticisms

OTTOMAN GUNS AND THE FALL OF THE BYZANTINE EMPIRE

Kelly DeVries

Department of History emeritus Loyola University Maryland

kdevries@loyola.edu

In 1453 Constantinople fell and with it the Byzantine Empire. Any historical account of the conquest of Constantinople, contemporary and modern, credit Ottoman gunpowder weapons with the victory. These accounts talk about guns voluminous bombards to hand-held coulverines, numbering in the hundreds if not thousands, facing a substantially smaller number of men with many fewer guns of smaller caliber and wall-mounted or hand-held. But Constantinople's walls had protected the city that had been besieged more than 40 times in a millennium but had fallen only once before 1453.

It's a nice, tidy story that fits well into yet another myth, the Military Revolution. Not unsurprisingly, as Bart Hacker always taught us, with most of the history of technology, the facts are more complicated and the history more difficult to interpret. This paper will investigate the history of Ottoman Turkish gunpowder weapons from their first appearance until the siege of Constantinople.

Keywords: Gunpowder weapons, Ottoman Empire, Constantinople, Thessaloniki, Ioannina

ALL HAIL TO THE WEAPONS: THE ARMS RACE AND THE MILITARY ADVANCEMENT IN THE STRUGGLE OF CENTRAL EUROPEAN HEGEMONY

Murat Aydin

Middle East Technical University

murat0661aydin@gmail.com

The Early Modern Era was a period of transition from the medieval world to a modern one. During that transition, technological advancements in various fields can be observed, including military technology. The improvements in the rifles, cannons, fortifications and strategies brought about a transformation of administrative styles. This paper aims at illuminating the contribution of the improvement in military technology to the rise of the Early Modern absolutist states, the Austrian Habsburgs and the Ottoman Empire, and their transformation of war-making in the 16th and 17th centuries. In western historiography, the Ottoman Empire was taken into account as a counterexample to the military revolution of Europe. Recently, it was seen that the military technology they used was very similar to that of their European counterparts. Although Ottomans employed gunpowder weapons in the 14th century, as Western states improved their technology, the Ottomans followed their trends and adapted it to their system, leading to the emergence of a centralised sultanate under Suleiman I. Yet, the questions as to whether small changes in weapons, such as the transition to flintlock muskets or shortening the size of the rifles, contributed to the emergence of the Ottoman Empire remain unanswered. For the Habsburg Austria, the aforementioned question does not have an answer yet. Although the Graz Tests were initiated to reveal the effectiveness of the weaponry in the Graz Museums, they only calculated the impact of certain weapons, not the effect of their evolution. Hereby, I argue that the improvement in weapon technology and the changes in war formations contributed to the emergence of Habsburg Austria as a decisive power, as the gatekeeper of Europe against the Ottomans in the 17th century. This paper, therefore, focuses on the effect of the small changes in the weapons technology that these states employed in the 16th and 17th centuries and their effect on their war-making and struggle to be hegemonic in Central Europe.

Keywords: Weapon, Technology, War-making, Improvement, Hegemony

PANEL TITLE:

**TECHNOLOGIES IN TENSION WITH THE NATION-STATE: ENGINEERING AS A
MEANS OF REGIONAL AUTONOMY AND SUPRANATIONAL INTEGRATION**

CHAIR:

Nelson Arellano-Escudero

ICOHTEC president

president@icohtec.org

SEMICONDUCTOR MANUFACTURING AND THE (DE)CONSTRUCTION OF SOVEREIGNTY

Cyrus Mody

Maastricht University

c.mody@maastrichtuniversity.nl

The semiconductor industry – the industry that makes the chips on which modern computing depends – began with the invention of the transistor by a team of Bell Labs scientists in the United States in 1947. Less well-known, though, is that the transistor was simultaneously invented by a pair of German scientists working in postwar France while their own (divided) country was governed by Allied occupation authorities. From that moment on, the semiconductor industry has been subject to both push and pull causing it to flow into spaces of contested sovereignty. The push has come mainly from firms seeking sites where they can more easily bend local laws to their needs: lower taxes, fewer environmental regulations, fewer restrictions on hiring and firing workers. Conservative military dictatorships (Portugal, South Korea), British colonies (Hong Kong), Indigenous reservations (the Navajo Nation), and renegade provinces (Taiwan) have all served that purpose at various times. Ironically, perhaps, the pull has come from places that see the acquisition of a foothold in the semiconductor industry as a way to strengthen their sovereignty. Taiwan, with its ideology of the “silicon shield” (i.e., using the world’s dependence on Taiwan’s semiconductor industry as a way to ward off an invasion by the PRC) is the classic and most important example, but there have been many others. In this paper, I survey the semiconductor industry’s complex relationship to sovereignty globally over the past 80 years and close with two European case studies. One concerns the predominantly Dutch-speaking Flanders region of Belgium, which embarked on a “Third Industrial Revolution” in the mid-1980s in order to create greater economic distance from the older industrial base of the predominantly French-speaking regions of Wallonia and Brussels. The most successful arm of that effort was the Interuniversity Microelectronics Center (IMEC) – today one of key players in global semiconductor R&D. My other case concerns the supranational European Economic Community’s attempts to build a European semiconductor industry through various innovation initiatives in the 1980s, both to integrate the continent and maintain competitiveness with the US and Japan.

Keywords: Taiwan, Flanders, silicon shield, semiconductor paradox, technopolitical autonomy

TIDAL POWER CHALLENGING NATIONAL ELECTRICITY INTEGRATION, BRITANNY, 1945-1985

Anaël Marrec

Nantes University

anael.marrec@gmail.com

In Brittany, tidal power has repeatedly carried great hopes of energy independence. Since the beginning of the twentieth century, the region has been fossil-fuel-deficient, and represented a testing ground for renewable energies (wind and tidal power), first by private then public electricity companies, and then by environmentalists who successfully challenged nuclear projects in the 1970s and 1980s. It has therefore endorsed various political objectives, while challenging the nation-state integration through infrastructure sought by the French electrification stakeholders. This paper thus examines the “chequered carrier” of tidal power in Brittany, from la Rance pioneer tidal plant's building in the 1960's, to activist proposals for small tidal plants in the frame of an alternative scenario for regional energy autonomy, the “Breton Alter Project”. Long standing stigmatisation for so-called economic under-development and cultural backwardness in Brittany indeed gave rise to claims for political autonomy and cultural recognition from the 1970's, that fuelled the political and social content of tidal energy projects. This trajectory sheds light on how the distrust of the nation-state has shaped renewable energy technologies, but also on how their materiality and their social effects changed desirable energy futures. It also shows the role of regional technological legacies, from the once numerous tidal mills, which declined throughout the century before regaining interest, to la Rance plant that soon caused damages (flooding, siltation, accidents, destruction of ecosystems). This work is based on archival research (correspondence between elected representatives, EDF and the Ministry of Industry at the departmental archives of Ille-et-Vilaine and at the national archives in Pierrefitte-sur-Seine) and an oral interviews with actors of the Breton Alter Plan.

Keywords: tidal power, energy, alternatives, environment, conflicts

DISCUSSING THE MATERIAL IMPACT OF A FUSION FUTURE: PERFORMATIVE QUALITIES OF COUNTERARGUMENTS DURING THE 1970S AND 1980S NUCLEAR FUSION HYPE CYCLE

Michiel Bron

Tilburg University

m.bron@tilburguniversity.edu

The promise of nuclear fusion as an inexhaustible source of clean energy has long played a key role in the imagined futures of energy policy makers, industrialists and activists alike. As this paper shows, these promises were, often quite fundamentally, challenged too, however. These critical voices critically contemplated the potential impact of developing nuclear fusion into a source of energy, and by doing so shaped future developments within nuclear fusion research and broader debates on environmentalism, extractivism, radiation and proliferation.

By studying reports, discussion papers and articles on fusion research during the 1970s and early 1980s from the perspective of anti-nuclear and environmental activist groups, policy makers, and fusion scientists located in France, Italy, the UK and the Netherlands, this paper categorizes nuclear fusion during the 1970s as a technological hype. Especially during 1970s, nuclear fusion guided the agendas of innovative actors by attracting financing, enrolling actors, and materializing in experiments and prototypes, but also structured the activities of the innovating actors and policy makers. This paper argues, however, that besides these innovative actors also the internal debates on counterarguments to the promise of fusion as an inexhaustible source of clean energy – that occurred even at the heights of its hype cycle – played a crucial role in shaping later developments within and outside fusion research.

The paper focusses on three case studies where (anti-)nuclear activists and fusion scientists challenged the future promise of fusion as an inexhaustible source of clean, and safe, energy: the need to extract lithium as a resource, the management of the radioactive waste generated by fusion reactors, and potential proliferation risks of fusion plants. As this article shows, these debates heavily influenced European guidelines for radioactive waste management regarding fusion research sites, played an important role in the siting of ITER in France instead of Japan, and laid the groundwork for the later extractivist narratives surrounding lithium mining in the Global South. By doing so, this article emphasizes that European integration through fusion research should not be understood as a process within a “closed container” but rather as a process in a global context with a lingering impact on worldwide developments.

Keywords: Technological hype, nuclear fusion, lithium, radioactive waste, proliferation

IDENTIFYING THE SOCIAL BACKGROUNDS OF ENGINEERING STUDENTS IN THE LATE OTTOMAN EMPIRE: THE CASE OF HIGHER SCHOOL OF CIVIL ENGINEERING (MÜHENDİS MEKTEB-I ÂLÎSÎ)

Ulas Duygu Aysal Cin

Istanbul Technical University, Istanbul, TURKEY

aysal@itu.edu.tr

This study aims to reveal the social backgrounds of civil engineering students in the late Ottoman Empire by analyzing the social class, which they belonged to, their ethnic identities, their birthplaces and the schools they had graduated before attending at the Higher School of Civil Engineering.

Civil engineering as a profession was highly respected by the Ottoman administration in the 19th and early 20th century since the engineers were seen as the main actors in the way of modernization as well as the economic development of the country and the only civil engineering school at the time was the Higher School of Civil Engineering. Thanks to the information gathered through the application files as well as the register books of the Higher School of Civil Engineering during the early 20th century, this study puts forward the profile for the candidate civil engineering students, who opted for an engineering career in the early 20th century Ottoman Empire.

Keywords: Mühendis Mekteb-i Âlîsî, Ottoman Empire, Engineering profile, social background of engineering students.

PANEL TITLE:

THE COLD WAR AND THE COMPUTERIZATION OF SCIENTIFIC DISCIPLINES

NETWORKING EARLY COMPUTING HISTORIANS IN THE COLD WAR PERIOD

Gerben Zaagsma

University of Luxembourg

gerben.zaagsma@uni.lu

This paper investigates the circulation of technological knowledge and expertise among transnational networks of computing historians in the 1960s-1970s. It asks how these networks were constituted, what the role of politics was in their shaping, and what influence on historical knowledge production they may have had. It will argue that early historical computing cannot be understood without considering the role of transnational knowledge circulation in its development. More specifically, it seeks to chart processes of field formation before the history and computing movement that emerged in the 1980s following the advent of personal computers.

The paper will first outline several transnational dimensions of early historical computing in the 1960s-1970s. It will then propose the framework of socio-epistemic knowledge networks (SEN) as developed in the history of science to chart the development of transnational scholarly exchange of early computing historians. In the second part, I will present the initial results of the application of the SEN framework and combine these results with insights gained from reconstructing the biography of Peter Wick. Wick was a historian and information specialist who worked at the Institute of History of the Academy of Sciences of the German Democratic Republic (GDR). During the international conference History and the Computer in Uppsala in 1973, arguably the first international history and computing conference, Wick presented a bibliographical analysis of historical computing literature from East and West. By analysing his work, and placing it within its specific GDR context, we can gain important insights about how geopolitical contexts shaped the nascent field of historical computing.

I will conclude by arguing that both types of reading, distant-aggregate and close-biographical, are necessary to gain a fuller understanding of early historical computing. Moreover, this complementary approach helps to highlight the complexities of circulation within the much larger context of scholarly exchange in the Cold War.

Keywords: history of historiography, digital history, quantitative history, socio-epistemic networks, history of science

FLOODS AND COMPUTERS: THE INTERNATIONALIZATION AND COMPUTERIZATION OF HYDRAULICS IN GLOBAL COLD WAR HUNGARY (1950S-1980S)

Jules Siran

University of Geneva

Jules.Siran@unige.ch

From the early 1960s onward, Hungary significantly developed the internationalization of its engineering sciences at the intersection of three priorities of the global Cold War: the scientific integration of the socialist bloc, technological competition with the West, and technical cooperation with the Global South within the framework of socialist developmentalism. Hydraulics played a central role, rooted in nineteenth-century river regulation works on the Tisza and early academic institutionalization of the discipline. This tradition underpinned renewed expansion in the 1950s, marked by dam construction and the Eastern Main Canal irrigating the Great Plain.

This discipline was deeply involved in these dynamics of cold war internationalization. Toward the Global South, Hungarian engineers participated in organizations such as the International Commission for Irrigation and Drainage (ICID), based in New Delhi, to showcase their achievements within a soft power framework. Toward the West, they benefited from mobility programs, notably Ford Foundation fellowships, which allowed researchers such as Miklós Kozák and Ottó Haszpra to access Western knowledge.

These circulations fostered the introduction of computational hydraulics in Hungary. After returning from the United States in 1969, Kozák helped restructure the field by developing numerical flood modeling. He trained a new generation of researchers, who were sent to specialize in Western centers such as Copenhagen and Delft. These developments enabled the creation, with UNESCO funding, of a postgraduate program in computational hydraulics in Budapest for experts from the Global South.

This paper examines the effects of the introduction of computing into Hungarian hydraulics. It argues that this process contributed to repositioning Hungarian engineers from a central status inherited from the Habsburg era to a semi-peripheral one. By re-exporting to the Global South knowledge acquired in Western institutions, they thus participated in reinforcing forms of dependency in the global circulation of knowledge.

Keywords: history of hydraulics, history of computing, cold war, socialism, Hungary

FROM ADAM AND EVA TO THE WORLD WIDE WEB: A BRIEF INTERNATIONAL HISTORY OF DATA SHARING IN PHYSICS

Barbara Hof

Université de Lausanne

barbara.hof@unil.ch

This talk shifts focus away from computers toward the networks that connected them, specifically tracing the history of international data sharing within the physics community. While previous scholarship has explored how computation reshaped early postwar physics—including the work of Peter Galison on the interaction between theorists and experimentalists, and that of Arianna Borrelli on the first computers at CERN—my analysis examines the two decades following the late-1960s détente, a period when laboratories across the East and West began to collaborate more closely, including in the field of data sharing. In exploring this development, I argue that the creation of the Web at CERN was only the most memorable peak of two decades of institutional, technical, and international collaboration. Drawing on archival sources, the talk demonstrates that CERN had already established sophisticated computer networks and the expertise to manage them long before Tim Berners-Lee’s famous web proposal. Networks such as the local CERNET in the late 1970s and the later international initiative for a High Energy Physics Network (HEPNET) emerged from the necessity of distributing massive data sets from experiments to analytical devices. Overall, the talk challenges Web-centric internet narratives by reorienting the historiographical focus from invention to infrastructure and from individual innovation to institutional processes.

Keywords: digital data, web history, history of computing, international relations, CERN

COMPUTATION AND THE CONSTRUCTION OF TARGETS – A DUAL-USE SCENARIO

Katherine Chandler¹, Nina Franz²

¹ *Georgetown University*

² *Hochschule für Bildende Künste Braunschweig*

kfc9@georgetown.edu

This contribution opens a critical perspective to the history of military computation in light of the current applications of predictive artificial intelligence. It examines connections between military targeting and civilian use of pattern analysis in commercial applications of AI through a historical lens, looking back to the origins of computation in the United States during World War II and its application in the Vietnam War. We trace the circuit of local relationships to global violence, considering how these connections shape what Galison (1994) calls the "ontology of the enemy." The focus is on the question of how targets become "constructed" through the means of computation. Thinking with Chow (2006), we examine how targeting systems follow an inherently self-referential logic. The history of computer-assisted "calculation" of military targets ties to the history of computation and is entwined with the gendered work of female "computers" who calculated ballistics in the 1940s at the Aberdeen Proving Ground in Maryland for weapons being used across the world during World War II. In the Vietnam War, computation again played a role in selecting targets, illustrating how advances in the computing power did not match lower number of failures or instances of collateral damage. Supposedly high-precision and intelligent bombing systems in Vietnam continued to impact civilians in ways that mirrored large-scale bombing of the earlier 20th century. What transformed was the environment of war, which comes to include not only the battlefield but the digital realm as well. Since the use of automated pattern recognition for the identification of targets became first known during the War on Terror, it has set a precedent for current developments, such as the use of automated targeting in the war in Ukraine and in the bombing campaigns of the Gaza Strip by the Israeli Defense Forces. Today, the dual function of artificial intelligence for war and commerce means everyday uses of computation are tied to the normalization of global asymmetries and violence linking ordinary online experiences with digital systems that are also calculating and predicting war.

Keywords: military targeting, computation, artificial intelligence, warfare, dual-use.

PANEL TITLE:

**DESIGNING CURRICULAR INFRASTRUCTURE IN THE HISTORY OF TECHNOLOGY
FOR TWENTY-FIRST-CENTURY CHALLENGES**

DESIGNING CURRICULAR INFRASTRUCTURE IN THE HISTORY OF TECHNOLOGY FOR TWENTY-FIRST CENTURY CHALLENGES

Frederick R. Davis¹, Yvonne Pitts²

¹ Professor, R. Mark Lubbers History of Science Chair & Department Head, Purdue University, West Lafayette, Indiana, USA

² Associate Professor, Department of History, Director of Graduate Education, Purdue University, West Lafayette, Indiana, USA

frdavis@purdue.edu, ypitts@purdue.edu

This paper investigates the challenges of designing and implementing History of Technology curricula within university ecosystems, drawing on the development of a newly established undergraduate major in the History of Science, Technology, and Medicine at Purdue University. The program is grounded in interdisciplinary collaboration between a historian of science and technology and a legal historian trained in cultural, social, and medico-legal history. Programming in the History of Technology, Science and Medicine entails distinctive demands: it must balance the dual imperatives of training students in the core disciplinary methods of analyzing historical change while cultivating fluency in interpreting technical systems, datasets, laboratory practices, regulatory regimes, and material artifacts within particularized historical contexts. Integrating these heterogeneous forms of inquiry into a cohesive undergraduate program requires methodological recalibration and deliberate pedagogical scaffolding, since technical literacy and historical interpretation must develop in tandem rather than in sequence.

Keywords: History of Science, Technology, and Medicine, Undergraduate Education

THE ENGINEER IN THE WORLD: TEACHING ENGINEERS THE HISTORY OF THEIR PROFESSION

Amanda Katz

Department of History, College of Arts and Sciences, Utah State University, Logan, UT, USA

amanda.katz@usu.edu

The study of engineering history is important for engineering students because it provides a foundation for innovation and offers a new perspective on contemporary problems. It also helps students develop a sense of professional identity and responsibility while providing students critical thinking skills, helps them navigate past mistakes, and shows how engineering is shaped by and shapes society. This can lead to more ethical decision-making in their profession. Using case studies from two American universities (Iowa State College and the University of Michigan) that developed strong highway engineering programs in the early twentieth-century, this research seeks to strengthen the ethical and professional skills of new engineers by enriching their technical understanding of the profession within a humanistic framework that shows how historical actors with social, political, and cultural motivations play a significant role in shaping engineers as policymakers who, in turn, serve as historical actors themselves.

Every profession has a history, and the degree to which that history is known and used determines the degree to which the profession largely knows and understands itself. Engineering as a discipline – and the engineer as a professional – emphasizes state-of-the-art innovation and the application of specialized technology. In many ways, engineering history is engineering. The history of engineering – from details of specialized fields to sweeping narratives of great projects – provides essential information and caveats about how engineers and the public navigate human needs and desires. Furthermore, exploring the history of engineering through a historical lens reinforces the applied nature of history as a discipline and helps mitigate the siloing of the Humanities and STEM fields from one another. Furthermore, engaging in such interdisciplinary study of engineering and its history promotes opportunities for global collaboration and cooperation. This is particularly salient for transportation and structural engineering as societies around the globe grapple with crumbling infrastructure, unstable economic and political forces, and destructive weather systems. Sharing this knowledge across disciplines and across borders increases the likelihood of technological innovation in engineering all while reinvesting in human response to such visible alterations to their environments.

Keywords: history of technology, engineering history, engineering education, expertise and governance, professionalization and institutions, twentieth-century, United States, global networks

HISTORY OF TECHNOLOGY AND MIDDLE SCHOOL MATHEMATICS CURRICULUM: IN THE INDIAN CONTEXT

Ankita Sengupta

Jote Shibrampur Girls High School, Kolkata, India

ankitasengupta57@gmail.com

When we see the present scenario of mathematics education in India, specifically at primary and secondary level, we witness a significant learning gap among the students. One of the reasons is that there is a want of linkage between the concepts of mathematics curriculum and the practical utilization of those concepts. For example, trigonometry is introduced in secondary level and students learn to solve problems regarding height and distance. But where do they utilize them and when? If a student does not have the opportunity to utilize their knowledge, then why should they learn an abstract concept? This abstractness leads to math phobia. John Seely Brown, Allan Collins and Paul Duguid advocated authentic math activity, where authentic activity can be defined as the ordinary practices of the culture. To relate mathematical concepts of present-day school education with authentic math activity, it is necessary to know why human civilization has learned these concepts throughout the history. History of technology can play a key role here. Jacob's staff or cross-staff, an instrument of medieval period, which was used in measuring the angle between two celestial objects can serve to illustrate this. A rod and a cross-piece attached vertically to that rod, helped pre-modern navigators to find their way in deep ocean. That historical technology was based on simple modern-era school trigonometry which is fascinating and can be utilized as an authentic math activity. But in the Indian classroom there are some problems which must be taken into account. It is a common picture in India that a single teacher has to deal with overcrowded classes with no digital support. A frontline teacher often grapples with constraints in time, resources and infrastructure. This paper is focused on the importance of incorporating the history of technology within the middle school mathematics curriculum under real life classroom constraints, to improve the mathematics learning of students, with the 'low cost or no cost approach'. After all a teacher cannot wait for an ideal situation but to make the situation ideal through own efforts.

Keywords: Mathematics Education, History of Technology, Middle School Curriculum, Middle School Curriculum, Authentic Math Activity

HISTORICAL IMAGINATION AND ARTIFICIAL INTELLIGENCE: PEDAGOGICAL TRANSFORMATIONS IN HISTORY TEACHING

Elias Stouraitis

PostDoc Researcher, Department of Humanities, Democritus University of Thrace, Komotini, Greece

stouraitis@gmail.com

Historical imagination established by R. G. Collingwood as a process of “reactivating” past thinking, and redefined narratively by Hayden White, is a key mechanism of historical understanding. In the era of generative artificial intelligence (Generative AI), historical imagination is transforming: from interpretive reconstruction to dynamic, algorithmically generated simulation. This paper examines specifically how this shift can be pedagogically exploited in history teaching.

Students can use AI systems to create alternative historical scenarios (“What if...”), to interactively shape historical figures, or to reconstruct everyday experiences of different social groups. The process does not aim to produce “correct” answers, but to cultivate historical empathy, understanding of the conjuncture and awareness of causality. The assessment focuses on comparing the algorithmic narrative with documented historical sources. The production of historical narratives from algorithmic models offers an opportunity to analyze biases, anachronisms and narrative stereotypes. Students are invited to identify discrepancies between documented history and produced content, to discuss the nature of historical authority and to reflect on the relationship between data and interpretation. Thus, historical imagination is transformed into a methodology laboratory.

In combination with game-based learning, AI can be integrated into simulations, interactive scenarios or small “historical workshops”, where students act as content curators. For example, they can design a digital exhibit, a virtual debate of historical figures or an interactive timeline that produces alternative developments. In this context, the teacher shifts from a knowledge bearer to a designer of learning experiences. Historical imagination in the age of artificial intelligence is not just a new technological tool, but a transformation of historical learning itself. From linear narrative we move to interactive simulation; from passive reception to creative and critical co-construction of the past. The presentation aspires to contribute to the formation of a coherent pedagogical framework that will allow History to creatively, but also responsibly, exploit the potential of artificial intelligence.

Keywords: artificial intelligence, history education, historical imagination, simulation

PANEL TITLE:

**INTANGIBLE ASSETS FOR THE STUDY OF TANGIBLE THINGS: DOCUMENTING,
LINKING, AND INTERPRETING CANADA'S DESIGN HERITAGE**

MAKING, UNMAKING, AND REMAKING RESEARCH COLLECTIONS FOR THE STUDY OF CANADIAN DESIGN AND TECHNOLOGY

Jan Hadlaw

Associate Professor in the School of Art, Media, Performance, & Design at York University in Toronto, Canada.

jhadlaw@yorku.ca

In March 2019, the Design Exchange (DX), Canada's only institution dedicated to collecting and exhibiting Canadian design, announced it was shuttering its museum operations and

deaccessioning its entire collection of Canadian industrial design. The decision sent shockwaves through curatorial and scholarly communities. The DX collection included an array of technological goods, ranging from domestic appliances to medical devices. Its scope captured and preserved the material outcomes of the Canadian government's post-WWII strategies to rebuild the national economy.

Beginning in 1947, the government had actively fostered the development of the Canadian design industry as a means to put to practical use the scientific innovations of the National Research Council and advanced technological manufacturing capacity developed during wartime. It was the withdrawal of the government's longstanding support for the sector 38 years later in 1985 that ultimately led to the establishment of the Design Exchange in 1994, and shortly afterwards to the founding of its collection. When the DX announced that it would terminate its collecting and museum activities, the Canadian Museum of History, Royal Ontario Museum, Archives of Ontario, and Carleton and York Universities stepped in to acquire its archives and 600+ artefacts, thereby preserving but also scattering the material collection. Concern over this dispersal led a team of historians to create the xDX Project in 2023, to 'virtually' reassemble and preserve the DX collection as a digital resource—the xDX ResearchSpace—for the study of the history and heritage of Canadian design and its relation to technology, business, and culture.

This presentation begins by tracing the history of the Design Exchange collection in both its material and immaterial forms and considers its value for understanding the role played by design in development of Canadian technological goods. It provides an overview of the xDX Project and its goals in developing the xDX ResearchSpace as a tool that allows researchers to link, locate, and interrogate xDX artefacts and archival materials. Finally, it seeks to prompt conversations about the possibilities and pitfalls offered by digital collections for scholars seeking to interrogate and/or challenge the hierarchies and assumptions of the histories of design and technology.

Keywords: Canadian Design, History; Heritage, Linked Open Data, xDX Collection

FROM ENVISIONED USERS TO MATERIAL PRACTICE: THE NORTHERN TELECOM DISPLAYPHONE IN CONTEXT

Sarah Mihychuk

artist and PhD student in Graduate Program in Communications & Culture at York University in Toronto, Canada.

mihychuk@yorku.ca

Northern Telecom's Displayphone was an electronic oWice technology that featured a compact screen with a private viewing plane, physically orienting content toward an individual user rather than a shared audience. Its wired telephone terminal and stowaway keyboard allowed its imagined user to access and alter data during calls. These material aWordances appear to have been based on assumptions about secretarial oWice labour and early digital communication practices; however, the Displayphone's intended user was the male executive. As a hybrid telephone- computer that promised seamless integration of voice and data, the Displayphone initially sparked excitement as it spawned the field of Integrated Voice Data Terminals (IVDTs), and it was part of 1980s Canada's imaginings of the "oWice of the future." Yet, it never gained a foothold and was discontinued within seven years. Despite its advanced features, it was met with cultural resistance from the very executives it was hoping to attract. Drawing on the resources of the xDX collection, Northern Telecom archives, and Canadian Department of Communications reports, this paper demonstrates that they viewed the physical and symbolic act of typing as incompatible with prevailing conceptions of masculinity. Even with a stowaway keyboard that could preserve the idea that they were not typing, executives rejected the technology with a vehemence that one source described as "bordering on sheer panic."

My study reinterprets the "failure" of the Displayphone through a feminist STS lens, supported by the Structurational Model of Technology (Orlikowski 1992) and Failure Studies (Lipartito 2003), and argues that the rejection of the Displayphone by its target market allows us to examine how gendered structures of oWice labour both shaped and were shaped by the design of technology. By analyzing the disconnect between the Displayphone's features and targeted executive-users, this study illustrates how industrial design can both encode and destabilize perceptions and expectations of computing technology and gendered labour.

Keywords: Gender relations, Canadian design history, office technologies, embodied experience

DESIGNING CORPORATE COOL IN THE 1960S: AN XDX CASE STUDY OF CLAIRTONE'S PROJECT G STEREO

Rosalind Sweeney McCabe

Masters student in the Department of Art History & Visual Culture at York University in Toronto, Canada.

r.sweeneymccabe@gmail.com

A 2008 Canadian Broadcasting Corporation news feature celebrating the Clairtone Sound

Corporation, founded almost 55 years earlier, opined that “it so well represented the future, and the future was cool.” A Canadian high-fidelity stereo and media technology company, Clairtone was only active from 1954 to 1972, but in that short time it achieved national and international recognition as an innovator in technology and design. My paper employs xDX ResearchSpace to investigate how Clairtone’s ‘cool’ reputation was produced through by exploring the connections between the company’s identity and the mediation of the Project G, its most iconic product.

The Project G was a high-fidelity sound system designed by Hugh Spencer in 1964. It

won accolades for its advanced engineering and awards for its ‘space age’ design, including a silver medal at the 1964 Milan Triennale. Its reputation as a trailblazer was bolstered by advertising campaigns featuring some of the ‘coolest’ celebrities of the 1960s—including singer Frank Sinatra and jazz pianist Oscar Peterson—and ultimately outlived the Clairtone company itself. The Project G’s acquisition by the Design Exchange in 1991 acted to confirm its iconic status as did the retrospective exhibition, *The Art of Clairtone*, organized by the Design Exchange in 2008 to celebrate Clairtone’s contributions to Canadian design.

Using the xDX ResearchSpace to map records in the xDX archive revealed that the

Clairtone’s ‘cool’ factor is tied directly to the promotional materials which mediated the Project G. My presentation traces how the Project G’s discursive representation as ‘cool’ reverberates through the archival records documenting its promotional materials and the subsequent historical accounts of the Clairtone Sound Corporation. Tracing the connections between the emergence of Clairtone’s ‘cool’ corporate identity alongside the Project G’s discursive elevation into a design icon symbolic of the cool 1960s demonstrates the role played by design and representation on the historical reputation of what was an upstart technology company.

Keywords: Canadian Design, History, Heritage, Linked Open Data, xDX Collection

PANEL TITLE:

**THE SUN FROM THE SOUTH: IMAGINARIES AND REALITIES OF CHILEAN
ENERGY DEVELOPMENT (1976-2025) (FONDECYT PROJECT 1250560)**

CHAIR:

Nelson Arellano-Escudero

ICOHTEC president

president@icohtec.org

COMMENTATOR:

Cyrus Mody

Maastricht University

c.mody@maastrichtuniversity.nl

BUILDING SOLAR STATES: CHILE AS A HUB FOR ENERGY IMAGINARIES (1976-2020)

Nelson Arellano-Escudero

ICOHTEC president, Universidad de Chile

president@icohtec.org

Focusing on the last timeline of a 150-year history of solar energy technologies connecting Chile to the western world, It argues that solar technologies have an “intermittent” trajectory: they emerge, work, are forgotten and later revived, leaving dispersed “loose memories” rather than a linear story of progress.

We explore the imaginaries of innovation, and Gregory Unruh’s techno-institutional complex, it explains how fossil-fuel systems became locked-in and how alternative solar paths were sidelined. Archives, artifacts and pioneer engineers (from Hirschmann to ACHIESA) show Chile as a part of an extensive network integrated to Europe, USA, and Latinamerica.

Our period of interest covers the time after Salvador Allende's Popular Unity government, the entire dictatorship period, and the period of the Concertación por la Democracia (Coalition for Democracy), political regimes with very diverse characteristics, but with perspectives on solar energy that were, nevertheless, quite similar.

Keywords: Solar energy technologies, Imaginaries of innovation, Public Policy, Didactics of history of technology, Global South

PLANNING THE SUN: SOLAR ENERGY, TECHNOCRATIC EXPERTISE, AND STATE STRATEGY IN CHILE'S MILITARY DICTATORSHIP

Felipe Martínez Fernández

Universidad Nacional Andrés Bello (UNAB)

fel.martinezf@gmail.com

Since the late 1970s, solar energy in Chile has been subject to state planning under the energy policies of the Pinochet dictatorship. This presentation examines the role of the Comisión Nacional de Energía (CNE, National Energy Commission) in shaping solar energy strategy during this period. It analyzes how the CNE framed solar energy as an efficient and forward-looking resource, despite its limited practical deployment.

A close reading of CNE records, held at the National Archive of Chile, reveals that solar energy was promoted within a highly restricted political environment. International visibility of Chilean' solar projects was carefully managed, and decision-making remained concentrated within closed technocratic networks. At the same time, the CNE commissioned feasibility studies on the domestic use of solar energy—particularly for water heating and household electricity—drawing on case studies. These initiatives relied heavily on collaboration with university research centres, which played a key role in extending solar expertise beyond the state apparatus and into civilian and private-sector domains.

These dynamics shaped the development of solar energy in Chile from the late 1970s to the early 1980s, embedding it within broader processes of neoliberal restructuring and technocratic and authoritarian governance.

Keywords: Solar energy technologies, Imaginaries of innovation, Public Policy, Didactics of history of technology, Global South

THE PLACE OF THE SUN IN CHILE'S NATIONAL ENERGY BALANCE

Cecilia Ibarra

Universidad de Chile

cecilia.ibarrachile@gmail.com

Although solar energy is an important part of the discourse on energy and climate policy in Chile and around the world, its share as a renewable energy source is small in international statistics. Even though Chile has been cited as an example of growth in this energy source and has seen an impressive increase in its share of electricity production, the amount of solar energy consumed remains minor in the national energy balance.

This paper explores the questions: What is the place of solar energy in Chile's National Energy Balance, and how does this case compare with the international balance? How does this place fit into energy policy discourses on this energy source? The national energy balance is the basis for reporting on international climate commitments and for national energy policy decisions. This recording system has internal consistency, showing the range of energy sources used in the country. The methodology used is standardised. However, as with any inventory, there are decisions about what to include and what not to include that should be considered when analysing the evolution of solar energy. The case of Chile is compared and discussed in relation to international data from the International Energy Agency (IEA).

Keywords: Solar energy technologies, Imaginaries of innovation, Public Policy, Didactics of history of technology, Global South

LEARNING FROM THE SUN IN THE RURAL SCHOOL: A PEDAGOGICAL EXPERIENCE FOR LEARNING THE HISTORY OF SOLAR ENERGY IN MAULE, CHILE

Diego Arango López,

Universidad Católica del Maule

diegoarangolopez@gmail.com

The history of science is a topic rarely addressed in Chile's national curriculum for history, geography, and social sciences. However, many of the objectives on the curricular axes cover themes that can be approached through the history of science and technology. This presentation explores an experience of planning, implementing, and evaluating a workshop on the history of solar energy in the Maule region of Chile.

First, we stated that the results of historiographical research require didactic tools for students and teachers in rural secondary education to approach new scientific knowledge. Moreover, we suggested that through these tools, it is possible to develop collective reflections on how solar technologies currently and historically participate in rural daily life. In this sense, the aim was for the solar didactic objects to be accessible in rural contexts and capable of being assembled and operated using basic knowledge and skills.

As a result, the experience showed that although students have an implicit territorial intelligence that links solar technologies to everyday activities, this does not usually become an explicit territorial learning within the secondary education system. However, the learning experience carried out, made it possible to generate explicit associations that connected solar technologies with secondary education skills across the axes of history, geography, social sciences, and natural sciences.

Keywords: Solar energy technologies, Imaginaries of innovation, Public Policy, Didactics of history of technology, Global South

PANEL TITLE:

PLASTIC ENVIRONMENTS

BRAVE NEW WORLD? THE SUBJECT “PLASTIC” IN POPULAR MAGAZINES AND NEWSPAPERS, 1950S–2000S

Stefan Poser

Karlsruhe Institute of Technology, KIT

stefan.poser@kit.edu

The slogans “Century of Plastics” (1950s) and “Jute instead of Plastics” (1980s) mark quite different approaches to similar materials. They illustrate how plastics generated quite different feelings and opinions. On the one hand, they were often recognized as cheap mass products, partially replacing valuable or rare materials (“Ersatzstoffe”). On the other hand, they took over a fundamental role as promoters of technical developments and became key-materials of the emerging consumer societies in the post war period. Whereas associating plastics with “progress” might have been the dominating point of view until the early 1970s, this changed after the European oil crisis. Environmental concerns gained more influence in Western European societies, and pollution by plastics has become an issue. The reputation of plastics changed again at the turn of the century. What are the reasons for this double shift of the public opinion? Why did plastics gain an important role in the environmental discussion, although heating of oil has a higher ecological impact and means – compared to the production of plastics – wasting a raw material? What can the history of emotions towards plastics contribute to the understanding of the history of plastics? There is still a lack of research concerning these developments. The paper will analyse the discourse on plastics in popular magazines and newspapers in the second half of the 20th century; focus is on Germany. In doing so, it aims to contribute to the investigation of emotional approaches to technology and technology-based materials.

Keywords: Plastics, Oil Crisis, Popular Culture, Environmental History

PLASTIC, CRAFTSMANSHIP AND AIR – A VIENNESE STORY OF INFLATABLE ARCHITECTURE

Florian Bettel

University of Applied Arts Vienna

florian.bettel@uni-ak.ac.at

The history of inflatable architecture is full of futuristic designs and fantastic structures. Starting in the years after 1945 architects conceived flying cities, buildings with pneumatic protrusions and experimented with sensory perceptions within the newly created forms. The history of these designs is full of ingenious ideas and plans, creative solutions and promises of a better society – hardly any of these were realised. The promises were too grand, the willingness of building contractors and residents to adapt to the new circumstances too low, and knowledge of the processing, material properties and durability of the PVC films used too limited.

This paper traces the history of a Viennese company to illustrate the interrelationships between pneumatic architecture and traditional craftsmanship, the transfer of knowledge between small businesses, universities and architectural firms at local and international level, and the technological history of plastic film processing. It is based on a study of the history of “schulteswien”, a company with three generations of experience in the processing of plastic films. A company that had to constantly reinvent itself in the decades after 1945 in order to keep pace with both technical developments and the changing industrial environment.

Keywords: Inflatable Architecture, Pneumatics, Synthetic Polymers, Corporate History, Consumer Culture

THE ARTEFACT AS AN HISTORICAL SOURCE – CULTURAL AND MATERIAL ANALYSIS OF PLASTIC OBJECTS FROM FORMER CONCENTRATION CAMPS

Maja Ossig

Lower Saxonian Cultural Heritage Office, Hanover

maja.ossig@gmx.de

The growing rise of right-wing extremism and antisemitism in society calls for a decisive response from society, but also from those academic disciplines that are involved in researching and documenting history. Even in academic discourse, it is often claimed that the Holocaust and the concentration camps have been exhaustively researched. Although the NS period belongs to the best researched periods in German history, there are still major gaps in the historical record concerning individual camps.

The most direct access to the Nazi era and the subject of concentration camps is through personal encounters with survivors; this opportunity will soon no longer exist. However, artefacts can also act as links to people, actions, and places, thereby conveying historical content. Artefacts provide a more direct access to the recipient than the written or spoken word, they have a different effect than images or texts.

This ongoing research project examines, by means of material culture studies and instrumental analysis, objects that were made by concentration camp prisoners. At that time, numerous prisoners were used for forced labour in the arms industry. The materials for these objects, including synthetic polymers, often came from semi-finished products from the production cycle. There is often little or no information about the people who made these artefacts.

The chemical and physical characterization of the materials is considered together with the material properties. Instrumental analyses of the plastics and the examination of manufacturing traces under the microscope allow conclusions to be drawn about the historical context and the manufacturing process of the artefacts. This information leads to considerations about which technical possibilities were necessary and available for processing. In the context of the camps, these considerations provide insight into the living and working conditions of the prisoners and the opportunities they found to produce these artefacts.

Keywords: Material Culture Studies, Synthetic Polymers, Holocaust, Conservation and Restoration

WESTERN BALKAN “PLASTICENE”: AN OVERVIEW OF THE EXTENSIVE USE OF PLASTIC PRODUCTS IN THE POST-SOCIALIST WESTERN BALKANS AND ITS ENVIRONMENTAL IMPACT

Anna Batzeli

Democritus University of Thrace (DUTH)

abatzeli@he.duth.gr

During the socialist era, plastic production and consumption in the Western Balkans were embedded within state-led industrialization and fossil fuel-based development strategies. Plastics were promoted as symbols of modernity and technological progress and were gradually incorporated into everyday life through items such as toys, household goods, and other consumer products. These objects not only fulfilled practical functions but also familiarized citizens with synthetic materials as markers of socialist modernity. Nevertheless, consumer culture under socialism remained comparatively limited in scale and differed structurally from Western capitalist markets.

The collapse of socialist regimes in the early 1990s marked a profound restructuring of economic systems, trade relations, and consumption patterns. As Western Balkan societies rapidly liberalized and integrated into global markets, they experienced an accelerated expansion of consumer culture. Crucially, this transformation unfolded more rapidly than the development of environmental governance, regulatory enforcement, and waste-management infrastructure. The result was not merely an increase in plastic consumption, but a systemic shift toward disposable, packaging-intensive consumption models characteristic of global capitalism. Single-use plastics and heavily packaged goods quickly became normalized in everyday life and commercial activity.

This shift has had far-reaching environmental consequences. The rapid and largely unregulated proliferation of plastic products has contributed to severe ecological degradation, particularly within aquatic ecosystems. Rivers and lakes across the region now function as visible repositories of post-socialist consumption. The Ishëm River in central Albania, frequently described as one of the most polluted rivers in Europe, and Bosnia’s Drina river exemplify the cumulative effects of uncontrolled dumping and infrastructural insufficiencies. Similarly, Potpečko Lake in Serbia—often referred to as a “lake of garbage”—has become emblematic of the region’s plastic crisis, regularly accumulating vast quantities of floating debris. These sites illustrate how waterways have become material witnesses to the socio-economic transformations of the post-socialist period.

The proposed paper argues that the proliferation of plastic waste in the Balkans cannot be understood solely as a problem of individual behaviour or insufficient environmental awareness. Rather, it reflects the structural consequences of rapid market transition, uneven institutional development, and the adoption of globalized consumption models without corresponding environmental safeguards. By providing a historical overview of plastic use from the socialist era through the post-communist transition, this study seeks to situate contemporary plastic pollution within broader political-economic transformations, with particular emphasis on riverine and lacustrine ecosystems as critical sites of analysis.

Keywords: Public Enterprise, Plastics, Consumer Culture, Modernity, Western Balkans

PLASTICS THAT SHAPED A TERRITORY: THE PRODUCTION OF CELLULOSE ACETATE AND NITRATE FOR THE EYEWEAR INDUSTRY IN THE CADORE REGION AND THE MUSEALISATION OF MADE IN ITALY ICONS

Alice Hansen¹, Marco Calvi²

¹ Restorer-officer of the Superintendency of archaeology, fine arts and landscape for the municipality of Naples

² Group Research & Innovation Manager of the Area of Certottica

alice.hansen@cultura.gov.it, marco.calvi@certottica.it

The eyewear industry in Cadore region boasts an illustrious tradition, dating back to the late 19th century and linked to the historical roots of «Made in Italy» products. Such sector covers the whole area of Cadore and Agordino, in the heart of the Dolomites, permeating the territory and characterizing its identity. To date, eyewear is a very large industrial branch: it is estimated that 1.2 billion people use glasses, which are in most cases made of plastic materials, and this has generated over 3.2 billion US dollars in revenue in 2023 only in the Italian Market (Statista, 2024). The main eyewear manufacturer is EssilorLuxottica, followed by Safilo, Marcolin Eyewear, Thelios and De Rigo Vision (ANFAO, Solaimani et al., 2021). In recent decades the awareness of the value of this historical and socioeconomic heritage led to the establishment of the Museum of Eyewear at the Palazzo Cosmo in Pieve di Cadore, Belluno (Italy) in 1996 (Fontana and Giampieretti, 2022). Currently, the Museum preserves about 1300 eye glasses of different ages (from the XVI century to the present day) and materials (metal, plastics, etc.). More or less 400 pieces are made of cellulose nitrate (CN) and cellulose acetate (CA). Furthermore, there are also hundreds of pairs of plastics glasses that are stored in private collections, with uncollected data regarding their state of preservation.

CN and CA were vastly used for the manufacturing of spectacle frames; in particular CN was used from the second half of 19th century, while CA was introduced in order to substitute CN from 1940s, because of the high level of flammability of cellulose nitrate (Van Oosten, 2022). These polymers show various and typical degradation symptoms, such as warpages, cracking and loss of plasticizer and other additives, that make glasses unpleasant to see, touch and at an olfactory level (Cucci et al., 2016). The musealisation of these types of glasses presents different problems for collectors and curators, mostly due to lack of: knowledge around materials and degradation dynamics, technical data, correct maintenance at controlled environment. From this perspective, the Interreg Dolomiti live OPTI-RAIL project tried to tackle the above-mentioned problems, with the aim to better manage and take care of such heritage, made of eyeglasses that are true Made in Italy icons of the territory of the Cadore, carrying immense material but also immaterial value. An active part of the project was the experimentation of restoration methodologies on a series of early 20th Century eyeglasses in celluloid from the historical collection of the SAFILO company, donated to Certottica for research. The objects underwent cleaning, adhesion, consolidation, reinforcement, aesthetical presentation procedures.

Conclusion: This paper offers useful recommendations and examples to curators, collectors and restorers for the conservation and the musealisation of celluloid heritage.

Keywords: Eyewear Industry, Plastics, Italy, Museum Collection, Conservation and Restoration

THE INTRODUCTION AND WIDE APPLICATION OF PLASTICS IN MEDICINE: PROBLEMS SOLVED AND NEW ISSUES ARISEN

Fanxiang Min

Nanjing University

fanxiangmin@nju.edu.cn

The development of human medicine and the improvement of clinical treatment capacity are deeply dependent on the breakthroughs in materials science, and medical materials are the core carrier connecting medical theory and clinical practice. Among various medical materials, although plastics emerged the latest, they have become the most widely used materials in modern medicine by virtue of their outstanding advantages such as light weight, strong plasticity and easy sterilization, promoting contemporary medicine to form the characteristics of “plastic medicine”. The wide application of plastics has effectively overcome many bottlenecks of traditional medical materials and provided irreplaceable support for the development of medicine. However, due to their inherent material properties, they have also given rise to new medical problems and environmental risks, whose solution directly determines the status of plastics in future medicine. Based on the theories and methods of history, this paper sorts out relevant literature, archives and clinical cases in medicine and materials science, conducts a comprehensive study on the introduction, promotion and dual impacts of plastics in the medical field, and provides theoretical reference for the optimization of medical materials and the sustainable development of medicine.

Keywords: Human Medicine, Plastics, History of Medicine, Medical Technology

WEARING PLASTIC: THE METABOLISM OF SYNTHETIC AND ARTIFICIAL TEXTILES IN THE 20TH CENTURY

Ellan Spero, Lisa Onaga

¹MIT

²Max Planck Institute for the History of Science, MPIWG

efs8@mit.edu

Textiles help us reconsider the ubiquitous technological circumstances of living in “plastic environments.” This paper explores the relationship between substances and objects that on the one hand appear to be inert and enduring, while on the other hand appear to be dynamic and ephemeral by centering upon the processes by which both plant and plastic materials are processed or transformed to generate new fibers for textile applications. From clothing to materials used in industry and the built environment, the diverse feedstocks of these objects deserve analysis in order to foster deeper comprehension of the complexity underlying what it means to wear plastic and how plastic wears down. For example, does transforming discarded plastic bottles into a fabric make it less plastic? Or, does adorning oneself with a plant-derived artificial textile garment foster a new sense of virtue that counteracts the perils of blatantly metabolizing plastics on a global scale. The significance of plastic environments that simultaneously consist of the natural and artificial are highlighted in a discussion of synthetic and artificial fibers in their historical practical and industrial contexts. For example, we advance this discussion of how bamboo, sometimes dubbed “green gold of ecosystems” by its proponents, became a primary feedstock for making artificial plastic fibers. The case of this fast-growing and rapidly renewable bamboo plant offers a provocative entry point into understanding the construction of narratives of sustainability and “fast fashion” while highlighting the environmental consequences of pollution long associated with the textile industry.

Keywords: Textile Engineering, Plastics, Consumer Culture, Fashion

AUTHORS INDEX

A

Åberg Anna	103
Albuquerque Sara	49
Almeida A.S.	34
Ambrosiani Aron	103
Angeles Fernández Elisa	36
Antonopoulou Chrysalena	56
Arango López Diego	162
Arapostathis Stathis	77
Arellano-Escudero Nelson	104, 105, 139, 158, 159
Armağan Emiroğlu Yasemin	43, 71
Aydin Murat	138
Aysal Cin Ulas Duygu	143

B

Balaban Sümeyye	71
Bassanelli Sara	42
Batzeli Anna	167
Bergame Nathalie	103
Bergman Yoel	136
Bettel Florian	165
Biçer-Deveci Elife	48
Bikou Lamprini	46
Bloomer Peggy	72
Bonadio Taiana	17
Bron Michiel	142
Burchardt Jørgen	63

C

Cakir Gamze	43
Călin Marius Daniel	22
Calvi Marco	168
Camille Paloque-Bergès	98
Ceconi Ana	17
Chandler Katherine	148
Cole Alyssa	78
Cornish Nathan	33
Corti Michele	74
Crespo Daniel	104, 105

D

D'Alençon Castrillón Renato	81
Das Shibani	120
Davis R. Frederick	150
De Gortari Rebeca	104, 105
Dekker Henk Jan	127
DeVries Kelly	137
Dobos Corina	67

Drago Antonino	35
Dunnett Jemima	111
Durco Michal	124

F

Fari Simone	54
Franz Nina	148

G

Garcia-Alonso Gemma	97
Gargano Mauro	68
Gerber Sophie	60
Ghiță Costel Beatrice	14
Gillis Tyler	62
Gkarakis Konstantinos	82
Gkospodinis Panagiotis	70
Goseberg Nils	27
Gressot Julien	99

H

Hadlaw Jan	155
Hall Alex J. V.	69
Hansen Alice	168
Harmo Ahto	59
Helerea Elena	14, 114
Hof Barbara	147
Högselius Per	116
Hua-Henning Jan	90

I

Ibarra Cecilia	161
Ihar Zsuzsanna	85
Iturriaga Luis	86

J

Jalaber Marie-Clémence	94
Jankowski Daniel	27
Jarecka Urszula	26
Jarosz Katarzyna	64

K

Karaca Şalgamcıoğlu Berrak	43, 71
Katz Amanda	151
Kazakevych Gennadii	131
Klanovicz Jo	83
Klanovicz Luciana	17
Kolibaba Alexander	58

Komitis Doxakis.....	45
Korhonen Ahti.....	20
Korkmaz Elif.....	43, 71
Koulouriotis Dimitrios.....	70
Krebs Stefan.....	100
Kumar Lalit.....	44

L

Laakkonen Simo.....	75
Lalli Roberto.....	15
Laney Monique.....	28
Lelutiu Laura-Mihaela.....	22
Li Zhihan.....	50
Liceaga Carrasco Tadeo Hamed.....	52
Lindgjerdet Frode.....	73
Liu Haoxuan.....	80
Lojek Oliver.....	27

M

Marrec Anaël.....	141
Mart Michelle.....	25
Martikánová Darina.....	104, 105
Martínez Fernández Felipe.....	160
Martynyuk Olha.....	130
Matala Saara.....	76, 103
Meira da Silva Milena.....	61
Meyer Alan.....	128
Mihychuk Sarah.....	156
Mikros Sotiris.....	30
Min Fanxiang.....	31, 169
Mody Cyrus.....	140, 158
Mouchtari Chrysoula.....	70, 96
Musso Marta.....	29

N

Nnake Nnamdi.....	118
-------------------	-----

O

Onaga Lisa.....	170
Ortega Soto Martha.....	52
Ossig Maja.....	166
Özdemir Nihal.....	84

P

Paraschos Panagiotis.....	70
Park Young Su.....	37
Pereira André.....	40
Petra Maria.....	65, 96
Piahanau Aliaksandr.....	101
Pitts Yvonne.....	150
Porat Hadar.....	41
Poser Stefan.....	164
Pozharliev Lyubomir.....	125

Prado García Francisco.....	81
Pronskikh Vitaly.....	93

Q

Qiu Jingjia.....	50
------------------	----

R

Ramnath Aparajith.....	121
Repanovici Angela.....	21
Reynolds João.....	53
Ricardi Alexandre.....	39
Rivero-Cantillano Rodrigo.....	88
Rogozia Liliana.....	21
Ronsin Juliette.....	57
Rose Sebastian James.....	119
Rupcic Tijana.....	19

S

Sabancı Zeynep.....	87
Sampaio Maria da Luz.....	53
Sanhueza Carlos.....	104, 105
Sastre-Juan Jaime.....	97
Schipani Pietro.....	68
Schürenkamp David.....	27
Scott Aishah.....	79
Sengupta Ankita.....	152
Serban Henrieta.....	47
Siran Jules.....	146
Spero Ellan.....	170
Steiner Marion.....	104, 105
Stouraitis Elias.....	153
Stranges N. Anthony.....	113
Streblow-Poser Claudia.....	13
Studenna-Skrukwa Marta.....	132
Sweeney McCabe Rosalind.....	157
Szabó Péter.....	24
Szylo Katerina.....	32

T

Tammiksaar Erki.....	133
Teixeira Alves Carlos Fernando.....	91
Torre Matteo.....	16

V

Vâlcu Adriana.....	95
Van Vliet Dulce.....	92
Veraart Frank.....	92

W

Walsdorf Anaïs.....	122
Wang Xun.....	89
Wang Zheran.....	110

Weizman Aviva	38
Wulff Petter	115

X

Xia Heng.....	18
---------------	----

Y

Yagou Artemis.....	51
--------------------	----

Z

Zaagsma Gerben	145
Zářický Aleš	126
Závodná Michaela	126
Zhang Jiajing.....	80
Zhang Shuo	109
Zhen Cheng	108
Zimmerman David.....	135