Exhibiting Skill:
Understanding, Documenting, and Communicating Skilled Practices
of Historical Industrial Environments

Saturday - Sunday, November 13-14, 2021
Virtual Program Presented Via Zoom

The Industrial Crafts Research Network is pleased to announce the schedule for their inaugural symposium, *Exhibiting Skill: Understanding, Documenting, and Communicating Skilled Practices of Historical Industrial Environments*. The Industrial Crafts Research Network is an international, interdisciplinary research network connecting academics, museum professionals, designers and practitioners who are dedicated to the study and communication of skill and knowledge within industrial crafts. The ICRN combines anthropological and historical sources with ethnographic techniques and emerging cognitive science to generate new approaches for their communication and exhibition.

November 13 Schedule

Panel 1
Knowledge Capture: Heritage Industry Case Studies

Robert Forrant, University of Massachusetts Lowell
Have Knowledge Will Travel: Late Nineteenth and Early Twentieth Century Precision Metalworking Amongst the Corn, Potato, and Tobacco Fields of Hatfield, Massachusetts

The precision machinery builder Porter Machine Works offers an unusual story, having survived some ninety years, with a reach around the world, from the small Connecticut River Valley farming community of Hatfield, Massachusetts (population 3200). Its history emerges from a trove of company records that survived and ended up in the loving care of the Hatfield Historical Society. The records organized into twenty-one boxes, Forrant consumed the firm's history in the summer of 2017, learning that manufacturers of everything from bicycles to automobiles to papermaking machinery owned a Hatfield-built lathe. How this came about tells us a great deal about how firms throughout the river valley recruited and cultivated workers—as well as how archival evidence, alongside hands-on practice, preserves information about the role of industrial skill in an agricultural economy. An associated challenge is the interpretation of this important story in the agricultural and library spaces that house the HHS today.

Pippi Carty-Hornsby, Science and Industry Museum
Preserving Skills and Knowledge in Heritage Machinery Operations

Heritage machinery demonstrations provide unique opportunities for museum visitors to experience the sights, smells and sounds of Britain’s industrial past. However, with many of the operating roles staffed by an ageing population, the sector is at risk of substantial knowledge loss; the tacit skills of the operators may be lost, along with the opportunity for the public to learn from and experience the machinery. This presentation details a knowledge capture approach on the collection of textile machinery at the Science and Industry Museum, prompted by the retirement of the last operator on staff with first-hand experience of the textile industry.

Cathy Randall, Lowell National Historic Park
Makers and Creators in a Historic Textile Mill

Automated spinning and weaving are central to the origin/story of modern industrialization, technology transfer, and practical improvements to technology in the modern period. Lowell National Historical Park and its Boott Cotton Mills Museum preserve and interpret those stories and the material culture of the industrial revolution in Lowell. A key immersive experience for museum visitors is the recreated ca. 1920 weave room, equipped with 90 operable Draper looms. Lowell NHP weaver Cathy Randall will provide a filmed segment about knowledge transfer among machine operators and between machine operators and museum visitors on the shop floor of Lowell, and field questions and comments about the opportunities and challenges of sustaining high quality interpretation through training in light of staffing turnover.

Michael Kimmel, University of Vienna
Capturing Skills at a Micro-Scale
This contribution discusses ways to do a micro-genetic analysis of skilled engagements. With the right tools researchers can capitalize on what experts know, including implicit and embodied facets. My preferred tool is Explication interviewing. It proposes highly specific techniques for creating a mindfulness-based dialogue with expert informants, a "cognitive midwifery" approach in which the interviewer facilitates recall. It allows us to inspect "thin slices" of a person's sensorimotor experience, decisions, as well as responses to the ecology step-by-step. Starting from these micro-moments the researcher can then work his or her way up to the causalities of a larger event. Complementarily, Cognitive Task Analysis methods are briefly introduced: the Critical Decision Method, the Knowledge Audit, and Concept Maps. Here, the charting and visualizing of interview-based data receives greater attention, partly at the expense of process sensitivity. I will discuss the pros and cons of different methodologies relative to different research aims.

Theory Spotlight:
David Kirsh, University of California San Diego
"The Challenge of Communicating Artisanal Knowledge"

David Kirsh asks "what is involved in developing a theory of human artisanal practices, a theory that recognizes tacit knowledge as the central element?" "This knowledge," he asserts, "has a decidedly first-person orientation. It is body oriented. Some of it is based on sensory motor knowledge of how to act in a nuanced way. Some of it is less motor and more cognitive, concerning what to attend to, how to see and sensemake in a professional way." Kirsch will discuss "why this theory is not reducible to an exportable algorithm," and explain why the "seductive image of downloading a skill in the film The Matrix is a fantasy, unless we pre-adapt the program to the motor and cognitive details of the recipient, and that will be enormously hard." He also contends that "a theory must include an account of context: the tools and the workshop where mastery is executed." In this talk, Kirsch will " sketch what such a theory must include: a) the action repertoire as modified by tool use and skill, b) an account of the relevant cognitive abilities of the stereotypical master practitioner, c) the situation awareness of a master at work, d) a theory of the work environment, including the nature of e) joint activity and shared social space."

Panel 2
Scientists and Artisans: Artisanal Practices and Realizations of Designs

Simon Penny, University of California Irvine
Crafting Beyond the Range of Sensing: Machine Tools as Sensorimotor Prosthetics

ICRN founder Simon Penny will outline the remarkable and rapid development of precision engineering in the UK in the first half of the nineteenth century, elucidating the emergence of new crafts or skilled practices specific to this realm of engineered materials and increasingly precise metrology. He will draw upon perspectives from distributed,

enactive and embodied cognition to elucidate some qualities of these new cognitive ecologies, and reflect on the transition from artisanal to technical practices, the increasing use of technical drawing and the increasing mathematization of engineering. Lastly, he will discuss the development of mechanical computing in relation to the development of machine tools and industrial machines.

Christopher Baber, University of Birmingham

Recovering Micro-Materialities in Technological Interactivity

Christopher Baber's interest is in the Ergonomics of using technology (both the potential for harm to people and the nature of the necessary skills) and in Embodied Cognition. Using technology requires 'technical reasoning' through tacit knowledge. Acting *is* thinking; physical actions are directed towards achieving goals, solving problems, and finding efficient and satisfying solutions to these problems. Tacit knowledge is difficult to verbalise and accounts of skilled action in the historical records are limited (written by people who were observing rather than performing the actions). We need to better capture the micro-materialities of interacting with technologies.

Kayle Avery, University of Delaware

3D Modeling and Pre-Industrial Craft: The Dominy Workshop and the Horological Gear Cutting Engine

Kayle Avery will describe the making, animation, and interpretation of a horological gear cutting engine for the H.F. Du Pont Winterthur Museum in Wilmington, Delaware as part of their recent exhibit redesign of the Dominy Workshop, where three generations of Dominy family craftsmen from Long Island worked. He will offer a method for virtualizing pre-industrial crafts using open-source software and describe pairing the 3D model with historical research to bring the model to life and connect it with the exhibit. The goal is to create a display that will provide visitors with a richer understanding of the machine's uses, the skills and knowledge required to operate it, and the family that did so against all difficulty.

Mark Thomas Young, Technical University of Delft

Tacit Knowledge in Print: Codifying Craft Knowledge in the Enlightenment

Towards the end of the seventeenth century, English natural philosophers increasingly ventured into a new space in the effort to acquire technical knowledge; artisans workshops. Their goal of codifying craft knowledge motivated the development of a new literary genre, the history of trades. This presentation explores the social and epistemological challenges faced by philosophers who contributed to this project and shows how, instead of signaling a rehabilitation of the status of artisans, attempts to appropriate the technical knowledge of craftsmen were often coupled with rhetorical strategies designed to reinforce rather than relinquish boundaries between artisans and natural philosophers.

Panel 3
Artist Interventions in Exhibiting Industrial History

Jim Gravette, Ruddington Framework Knitters Museum & Jane Middleton Smith, John Smedley Ltd.

Artist Collaborations and Creativity at John Smedley Ltd/ John Smedley Archive Charitable Trust and the Ruddington Framework Knitter's Museum

The Framework Knitters Museum remains the only site in the world with a training program to preserve the endangered craft of hand frame knitting. The last two years have seen the museum work with artists and craftspeople to help articulate the skill, ingenuity, and resilience that knitters have shown in the last 400 years and to find new applications for this knowledge and craft. This story now unfolds through a series of creative commissions produced by artists and wellbeing groups that engage the visitor with the power and importance of craft and creativity.

Since 1784, John Smedley has used only the very finest fibers to design and manufacture innovative, luxury knitwear, using craft skills that pre-date the Industrial Revolution combining them with the latest technology. The core processes and dedication used in the creation of our knitwear, are the same as those employed by skilled artisans in many other crafts. This paper will outline the evolution of the company's thinking in terms of working with craftsmen and artists and will showcase how the juxtaposition of our products with those of other craftspeople is being used to promote the brand and grow new audiences.

Neil Brownsword, Staffordshire University
Beyond Preservation: Re-evaluating Intangible Cultural Heritage in the UK Ceramic Industry

Since 2003, Neil Brownsword has been engaged in mapping the impact of global economics upon traditional ceramic manufacture in his hometown of Stoke-on-Trent. Using a range of intersecting approaches that include social practice, collaborative performance, object installation and re-enactment, his works have drawn greater critical attention to people and traditional knowledge marginalised by regional industrial change. Whilst advances in automation technology and outsourcing have facilitated greater productivity, once commonplace skills associated with ceramic manufacture have been displaced, threatening the continuation of traditional know-how. This presentation elucidates Brownsword's artistic projects which re-evaluate intangible cultural heritage within Stoke-on-Trent's ceramic sector.

November 14 Schedule

Panel 1
Living History and Industrializing Skill

Peter Watson, Howell Living History Farm & the Association for Living History, Farm and Agricultural Museums (ALHFAM)
One Farmer's Past, Another Farmer's Future

In this presentation, ALHFAM Skills and Knowledge Database founder Pete Watson, now co-chair of ALHFAM's Skills Training and Preservation Initiative, will introduce the strategy that the organization is using to help historians manage the living—and often intangible—culture surrounding the objects in a material collection. This management extends beyond the preservation of the objects themselves and into the preservation of the skills that give them purpose.

Karl Schmidt, Tinsmith
Working Tinplate by Hand and by Machine: Eighteenth and Nineteenth Century Processes

In the eighteenth and nineteenth centuries, tinsmithing was an industrial craft. Tinsmiths typically worked independently but were dependent on tinplate made in mills and tools made in foundries. Until the early 1800s, when a series of patent tinsmithing machines were invented and introduced, tin work was done entirely by hand, using stakes to shape the metal. New hand-powered machines sped up the process of shaping the metal, particularly for repetitive operations. In this video demonstration, Karl Schmidt, using antique tools, will discuss the process of working the tinplate both by hand and by machine, highlighting the multi-sensory nature of this work.

Tom Kelleher, Old Sturbridge Village
Training Living History Interpreters: A Continuous Process

Living history interpreters do much more than don historical clothing; they also must master and refine a wide array of communication techniques and often rather arcane sets of hand skills as well, to effectively engage the public in meaningful conversations about the past and the present. In this session Tom Kelleher, Historian and Curator of Mechanical Arts at Old Sturbridge Village (the largest outdoor history museum in the Northeast U.S., depicting a rural New England town of the 1830s), will summarize some of the means employed, and challenges encountered, at one living history museum, and how they continue to evolve with changing times and technology.

Theory Spotlight:

Daniel Black, Monash University

From Habit to Behavior: The Historical Influence of Two Different Attempts to Explain the Adaptability of Human Actions

In this talk, Daniel Black will "compare 'habit' and 'behavior', two ways of conceptualizing patterns of human action that have influenced attempts to manage working bodies." In the nineteenth and early twentieth centuries, he argues, "responses to the ills of industrialization were importantly informed by the concept of habit, whose emphasis on processes of shaping and adaptation allowed for the possibility of self-directed personal change over time. During the twentieth century, however, habit was supplanted by behavior, a concept founded on mechanistic principles of cause and effect and the probabilistic analysis of human action, which broke human action down into discrete fragments of time."

Panel 2
Cognition, Tools, and Craft

Justin Squizzero, The Burroughs Garrett and Eliza West, Textile Historian

Jacquard Heads and Fulling Mills: How Machines and Craft Skills Unite in Early Industrial Textile Production

Textiles, often perceived as the bellwether of industrialization, are also a nexus for exploring how early mechanization was used in tandem with craft knowledge and hand skills. In this presentation, historical hand weaver Justin Squizzero will speak about his work recreating the work of 19th century fancy weavers, working with - and within - his loom, and textile historian Eliza Will will detail her work to re-embody the craft knowledge of early 19th century American woolen finishers. The two will then be joined by Dr. Marla Miller for a discussion on how practitioners are able to access different types of industrial craft knowledge, and how that knowledge is further tempered through work.

Hugh Crawford, Georgia Institute of Technology

Cognition and Wood

In this talk, High Crawford will look at "practices occupying the place between traditional notions of craft and industrial production." In building construction, he notes, "dimensional lumber standardizes materials, processes, and workers, yet on-site it must be worked. Some tools scale production, increase precision and force, and also are a form of computation." This paper will discuss that nexus via the barn-beam auger. From the 1880s, this tool bores mortises in large timbers. Where a framing the chisel effects one measurement—width—the auger regulates width, depth, angle, and the gestures of the operator, and helps show how tools that partially automate shaping material are part of a larger cognitive envelope.

Panel 3
Interpreting Skill in Museum Settings: Why this history matters to the past, present, and future

Oliver Betts, National Railway Museum

Dr Oli Betts is the Research Lead for the National Railway Museum where he helps develop the academic work of the museum. A historian of nineteenth- and early-twentieth century Britain, whose primary research focus has been on the relationship between space, social class, and lived experience in Modern Britain and beyond. Deeply passionate about working-class and industrial history, he is currently Co-Investigator on 'Piston, Pen and Press', and as part of this AHRC-funded project is developing links with literature scholars, creative writers and museum professionals.

Kirstie Blair, University of Strathclyde

Kirstie Blair's primary area of research is Victorian literature, particularly poetry and poetics, working-class writing, literature and religion, Scottish literature, and literature and medicine. She also researches and teaches in the field of children's literature from the nineteenth century to the present day. I have published two monographs on Victorian poetry, and edited or co-edited two essay collections, plus a variety of articles and book chapters. She is currently completing a monograph on working-class verse culture in Victorian Scotland and have just edited an anthology of Scottish Victorian newspaper verse, The Poets of the People's Journal.

Seth Bruggeman, Temple University

Seth C. Bruggeman is an Associate Professor of History at Temple University where he also directs the Center for Public History. A graduate of the College of William & Mary's PhD program in American Studies, Bruggeman studies the role of memory in public life, and particularly how Americans have used objects—in museums, monuments, historic, sites, and other commemorative spaces—to exert control over how we understand the past. His courses concern American cultural history, material culture, memory, and public history. His books include *Lost on the Freedom Trail: The National Park Service and Urban Renewal in Boston* (University of Massachusetts Press, 2022), *Commemoration: The American Association for State and Local History Guide* (Rowman & Littlefield, 2017), *Born in the USA: Birth and Commemoration in American Public Memory* (University of Massachusetts Press, 2012), and *Here, George Washington Was Born: Memory, Material Culture, and the Public History of a National Monument* (University of Georgia Press, 2008).

Amy Glowacki, Springfield Armory National Historic Site

Amy is a 27-year career employee of the National Park Service. Currently she is the Program Manager for Interpretation and Education at Springfield Armory National Historic Site and the soon to be established Coltsville National Historical Park. She served as the Northeast Region 1 Youth and Volunteer Program Manager. During her twenty years at Lowell National Historical Park she focused on education and interpretation, before shifting to volunteer, and youth employment programs management. She holds a Master of Arts degree in public history from Indiana University-Purdue University at Indianapolis and a Master of Science degree in resource interpretation from Stephen F. Austin State University.