

Tagungsbericht

Reparieren, Improvisieren, Re-Arrangieren Eine Technikgeschichte des Unfertigen

Jahrestagung des Interdisziplinären Gremiums Technikgeschichte des VDI (IGTG), in Kooperation mit dem Fachgebiet Technikgeschichte der TU Berlin und dem Deutschen Technikmuseum am 15. und 16.9.2022 in Berlin

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When we think of technologies that surround us, we often devote more thought to their invention than to their afterlives. This tendency stems from a rather wrongheaded conceptualisation of “technology”, suggests David Edgerton in his seminal work *Shock of the Old* (2006): We are so preoccupied with “inventions/innovations”, we overlook the *use, maintenance and repair* of technologies. Focusing on the latter can help us recognise the continuous human effort required to prevent technological artefacts from decay and breakdown. If we take the world as “always-almost-falling-apart”, a perspective described by Steven J. Jackson as “broken world thinking”, we should see technology as something that requires constant fixing. This fixing process involves reinvention, reconfiguring and reassembling that matches existing knowledge with available resources. Different techniques of repair such as re-arrangement of components, improvisation with different materials, or the application of old techniques in new technical contexts are not only evidence of human brilliance, creativity and resilience, but practices which also give objects a second lease on life, contributing to more sustainable consumption.

This year’s annual conference of the Interdisciplinary Committee on the History of Technology of the VDI (IGTG), which took place on the 15 and 16 September in a hybrid format titled “Reparieren, Improvisieren, Re-Arrangieren. Eine Technikgeschichte des Unfertigen” sheds light on these under-discussed yet crucial practices of maintenance and repair. Organised by the German Museum of Technology Berlin in cooperation with the Department of the History of Technology of the TU Berlin, the conference aimed to discuss historical, practical, economic and methodological dimensions of repair through a series of interrelated points: (1) The importance of repairing, improvising and re-arranging in the history of technology. (2) The practical side of repair, i.e. replacing spare parts, D.I.Y. culture, repair education. (3) The role of repairing for a more sustainable economy. Gathering presenters from diverse fields and institutional backgrounds such as NGOs, museums,

and universities, the conference aimed to contribute to the expanding field of repair and maintenance studies.

The conference was inaugurated by *Joachim Breuninger* (Berlin), director of Deutsches Technikmuseum Berlin, and *Dieter Westerkamp* (Düsseldorf), representative of VDI e.V. Breuninger insisted that the repair concept would be on the agenda of future curations at the museum, while Westerkamp emphasised the role of repair in a circular economy model. Subsequently, *Heike Weber* (Berlin) provided introductory remarks on why the conference is correct to characterise “technology” as unfinished, arguing that it is in fact, maintained, repaired, repurposed and re-arranged technological objects which constitute the *norm* rather than the exception. On the other hand, repairers and maintainers often fade into the background due to the low payment and prestige associated with these jobs. However, without skilled personnel, their tacit knowledge and-specific know-how, it would be impossible to recognise and troubleshoot technological problems—be they tiny gadgets or the large infrastructure systems on which our lives depend.

The first day of panels opened with a session dedicated to the theme “Improvisieren und Re-Arrangieren”. *Jonas van der Straeten* (Eindhoven) delivered his paper on electrical transportation, specifically rickshaws, in Bangladesh. The aim of his study was to show how electromobility in a resource-scarce context such as Bangladesh was not recognised as an “innovation” because the sector is informal, unregulated and organised by small actors, in contrast to big state-subsidised companies of Germany, where technological change towards electric transport was considered path-breaking and environmentally friendly. He also argued that the concept of “bricolage”, meaning an existing or imported technology adapted to local needs through the rearrangement of old and new, is only used in the context of the Global South and would otherwise be conceptualised as “technical progress” in the West. His paper concluded that technological change, as in the case of Bangladesh’s electric rickshaws, provides a good starting point for revising the Eurocentric history of technological development. *Arda Akkuş* (Berlin) then presented his research tracing the long-life cycle of a centenarian steamship named the KURT HEINZ. He presented his historical account of the repair practices that the ship underwent throughout the years, such as riveting, sweating and welding with photographic material. Originally commissioned in 1901 as a steamer between Berlin and the Baltic Sea, the ship was maintained and modernised by the GDR due to vessel shortage. Kurt Heinz is now on display as a museum object in the German Museum of Technology Berlin and it stands as living proof of how the re-arrangement and maintenance practices contributed to technology’s longevity.

The second panel aimed at contextualising the repair practice within the 20th century. The first presentation given by *Stefan Krebs* (Luxembourg) challenged the common assumption that repair services were gradually

made redundant in the face of booming mass consumption and disposable and inexpensive consumer goods. His qualitative research focused on the assumed decline of repair in post-70s Luxembourg in which he analysed the fluctuation in the number of repair personnel vis-a-vis the number of repair shops. His findings were striking: repair services did not vanish— because the total number of repairers increased— but repairable products did, which indicated that repair services concentrated on fewer sectors than before. Although official data shows a general stagnation in the Luxembourg repair sector, the statistical data, he argues, excludes some repairers in the 1970s. In light of this research, it is no longer tenable to assert that repair practice gradually died out with the advent of consumer society. The following paper, given by *Thomas Hoppenheit* (Luxembourg), examined the decline of the shoemaking trade in Luxembourg from the 19th into the 20th century. He argued that from the late 19th century onwards, shoemakers gradually moved from the production side into the repair side of the trade. Especially with the industrially produced, more durable and cheap rubber soles, repair practice itself became more costly and high expenditures eventually took a toll on the repair sector. Nevertheless, the decline story was not as linear as is often assumed. A *longue durée* approach shows that shoemakers adapted themselves to new challenges and needs, always inventing and reinventing themselves. Finally, *Jonathan Voges* (Hanover) addressed the rise of the DIY culture in the postwar Federal Republic. He pointed out that the expansion of leisure time as opposed to working time, increasing prosperity, and home ownership led to the popularisation of this movement. He also showed how the media cultivated the image of DIY as a masculine trait and how DIY became associated with pleasure and “*Gemütlichkeit*.”

The first day was finalised with a podium discussion entitled “Drehen wir uns im Kreise? – Reparieren & die Circular Economy.” The podium brought together *Nora Sophie Griefahn* (Cradle to Cradle NGO), *Tom Hansing* (Runder Tisch Reparatur e.V.), *Markus Hecht* (Berlin) and *Heike Weber* (Berlin), and was moderated by *Katja Weber*. The key question posed by the discussants was whether we should prioritise repair or the circular economy model. In response, Griefahn suggested that in order to ensure climate and resource protection, we must advocate for circularity in production design, everything that is produced either should be recycled or biodegradable. Thus, one product must have multiple use scenarios within the same economy. With such innovative design techniques, we can combat the ecological, economic, and social problems from growing waste disposal, which affects particularly the Global South. However, other panellists mentioned the second law of thermodynamics, entropy, as a counterexample to the circular economy model. They stressed that recycling before repair means that both energy and resource consumption will increase accordingly, ultimately leading to further resource depletion. Hansing and other discussants agreed that the repairabil-

ity of products is slowly disappearing and that we should instead advocate for designs that can be repaired. Markus Hecht made a fascinating point that infrastructures, unlike consumer goods, are particularly durable and repairable; some ICE trains, for example, have been in service for several decades. Finally, Weber brought a historical perspective to the debates on recycling and waste. She pointed out that mass production has changed our habits regarding reuse and the concept of waste; today, most obsolete goods are not unusable but are simply replaced by newer technologies. We, therefore, need to think critically about the lifespan of products before we talk about recycling. As an example, she cited the environmental movements of the 1970s, when recycling became a major political concern. Since then, the triumph of recycling has led to more consumption and even less reuse, which in turn has failed to provide a transformative solution to our ever-growing waste problem. It is now time to learn from this history and advocate equally for „reduce“ and „reuse,“ as the slogan „Reduce, Reuse, Recycle“ states, for which there has been no political lobby. When it comes to the either/or question, she argued, we should prioritise repair. All in all, the panel discussion was marked by a lively debate about one of the most pressing issues facing our world.

The second day began with a session “Vom Alten zum Neuen? – Wartung, Umnutzung und Innovation.” Two presentations addressed the key concept of “innovation” and questions about the “*Mangelgesellschaft*” (a term used to describe GDR as a shortage society without a consumer culture), that guided the conference-wide discussions on repair and recycling. *Rebecca Mossop* (Luxembourg) described forms of maintenance and repair of large infrastructure systems, using her study of the Luxembourgish telephone system as an example. In the following presentation, *Reinhild Kreis* (Siegen) presented her work on youth talent contests such as “Jugend forscht” in the West and “Messe der Meister (von Morgen)” in East Germany. In both cases, the state’s goal was to “secure a future” in the age of Cold War competition by promoting repair, while providing an environment where young people could be creative and innovative as they experimented and solved technical problems. Using these historical examples, she urged for a critical reflection on the concepts of innovation, which are usually used in conjunction within the western liberal consumer societies, and functionality/multifunctionality. She added that the importance of repair in the East could not only be explained by shortage society, the social expectations also played a role.

The conference’s last panel addressed the repurposing and re-arranging “old” technology in the context of technical cultural heritage. The session was guided by the question: How can the balancing act between preservation of the old and current use be achieved? *Stefan Höltgen* and *Thomas Fecker* (Berlin) presented their work on the retrofitting—upgrading an old technology with recent modified parts or equipment—of old computers while *Johannes Großwinkelman* (Rammelsberg) took us on a historical tour of the industrial

mining site at Rammelsberg, a UNESCO World Heritage Site. Using the ore mine's recommissioned conveyor system as an example, he provided insights into this mediation activity—ensuring safety for tourists while preserving the old technology is a hard balance to strike.

The second and last podium discussion “Wenn's wieder gut werden muss: Abstieg und Aufstieg der Reparaturbildung” brought together *Hans-Liudger Dienel*, *Janina Klose*, *Martin Schlecht* (Berlin) and was moderated by *Heike Weber*. The participants discussed the key challenges of repair education and presented two current projects that aimed to foster repair culture. Firstly, Hans-Liudger Dienel provided a general snapshot of the repair field. He asserted that the pressing problem for repair education is that repairing is no longer economically viable. Before the 1950s labour was cheap and the material was expensive. But with mass production, this equilibrium was reversed. In the following presentation, Janina Klose demonstrated a 3D printing project which aims to promote self-reliance as well as product longevity by reproducing spare parts. In her workshops, students can replicate broken plastic parts of devices that would otherwise be obsolete. She emphasized that social acceptance of repair among children is an important prerequisite for promoting repair education. Martin Schlecht, on the other hand, argued that neither economic nor social conditions are the real obstacle preventing repair, but rather the emotional aspect of repairing. The fear of destroying the “hardware” to which we are emotionally attached cannot be overcome by us, users. All discussants emphasized the importance of acquiring competence in repairing objects and opened the discussion to the audience. An important question raised by one of the participants was the problem of urgency—to what extent can the repair movement take into account the urgency of the object to be repaired—which unveiled another issue that should be addressed by repair projects in the future.

The closing remarks were given by *Heike Weber*, who argued that the conference had achieved its core objectives: it had shown that technology is in fact “unfinished”, it is constantly repurposed and remade; secondly, it put repair practice under the spotlight, examining not only its economic, social but also its emotional dimensions while placing it in an intercultural and historical context. The conference, she stated, also had practical discussions as to how repair education can be revived in schools.

In conclusion, the conference succeeded in provoking fruitful and at times heated discussions on the history and practice of repair, recycling and the circular economy. By bringing together various academic perspectives and practical experiences under one roof, it did an excellent job of contributing not only to academic research but also to important social and economic debates of our time. However, as with any new area of research, repair studies has its shortcomings. The major terminology is still not standardised, and case studies often lack a shared framework for discussing and analysing phenomena such as repair, maintenance vs. innovation. Methodologically, too, accessing historical

data on acts of repair and maintenance as well as identifying, structuring and analysing repair knowledge of human actors continues to pose challenges. The productive and exciting debates at this year's conference show that this field has lots of interesting things to say. And, with the climate crisis and rising cost of living, the importance of repair and maintenance are only going to be more important—whether we like it or not.

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