In debates surrounding Europe's shared history, the role of technology is hardly addressed. As a contributing factor, it appears too far removed from political or cultural processes of integration. At the same time, civilian and military technological developments have often contributed to unintended – and since the 20th century firmly adhered to – processes of homogenization. The binding effect of infrastructures contributed as much to this as structural similarities in technological knowledge and the knowledge of technology. It must be emphasized, however, that the unintended homogenization processes in the core regions of Europe were by no means first linked to the continent's period of rapid industrialization, but were gradually solidified beginning in the early modern period.

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Technology as a factor in European history – remarks on the current state of research

In some respects, the subject of "technology" is a special case in European historical research. Indeed, "technology" continues to be overlooked by historians as a contributing factor in Europe's historical development. This is not only because the findings of historical research on technology are accorded relatively little notice in the field – there is also a fundamental disparity in the way that Europeanization processes are analyzed. For some time, attention was primarily centered on the conscious imagination or the emergence of European entanglements. Unintentionally driven processes of cultural homogenization, by contrast, did not come into focus until later. There are, however, a number of technological-historical developments, especially in period before the 20th century, that are specifically attributable to this arena of unpremeditated change. On the one hand, there were processes of technological transfer based on individual motives. On the other hand, whenever political actors deliberately promoted the transfer of technology across territorial boundaries, it was not typically done for the purpose of securing economic, military or cultural advances for one's own territory. Instead, the constant competition between European territories since the early modern period ultimately led, quite paradoxically, to relatively uniform basic structures for both promoting technological developments and their cultural perception and interpretation.

By and large, the history of technology as a sub-discipline has methodically researched technological developments in Europe for a variety of sectors from 1450 to 1950 – albeit far more comprehensively for Europe's core regions than for peripheral or bordering cultural areas such as the Ottoman Empire (Media Link #ab). This is also true for processes of knowledge and technology transfer like the migration processes of craftsmen, the continuous jockeying for position of commercially prosperous regions in Europe, the reception of the English industrialization model on the continent, and the subsequent creation of European "expert cultures." The fact that these phenomena have a European dimension is typically mentioned in passing. Important questions, however, remain largely unanswered. For instance, what were the implications of such processes for the long-term genesis of a specifically European "technological space" with converging lines of development in production and the cultural reception of technology? And how did such transfer processes come to continuously shape centers and peripheries of Europe in ever-new ways? Answering questions like these is especially challenging, because current methodological developments of transfer research increasingly emphasize the complexity of mutual learning processes. At the same time, an analysis of Europeanization processes requires more of a bird's-eye-view perspective that reduces complex processes to common baselines.
Against this backdrop, it is not surprising that a methodologically differentiated overview of the European dimension of the history of technology in the period under discussion here – the years 1450 to 1950 – does not yet exist. This is partly due to epochal boundaries which characterize technological-historical research as a whole, i.e. the largely separate treatment of the technological history of the early modern period, on the one hand, and the beginning of the industrialization process (Media Link ac) in the 18th and 19th century and the high industrialization of the 19th and 20th century, on the other. So far, systematic studies on the significance of technological historical developments in the history of Europe have focused almost exclusively on this latter phase. They treat major technological projects, such as the building of transnational infrastructure in the transportation, energy, or communications sectors as well as the role of engineering-centered expert cultures or the appropriation processes of technologies by consumers or hobbyists. Contextualizing such technological-historical developments in their political, economic, social and cultural dimensions has shown that, in addition to integration effects, technological developments have also always contained fragmenting and exclusionary forces.3

The larger picture, however, clearly shows that Europe's unification process is not merely evident at the political level, where it explicitly followed the vision of a united Europe in the beginning of the 1930s and especially after the Second World War (Media Link ae). Indeed, the following obverse interpretation has also been put forward: "There is no doubt that technology, infrastructures and logistics have made a more profound contribution to the integration of the European and global community than politics."4 In any event, European integration was, and still is, also a result of the construction of transnational infrastructures and the mutual linking, circulation, and appropriation of technological artifacts. This dynamic process of Europeanization, however, took place in a way that was more "hidden" than planned, explaining why it is often referred to as a course of "hidden integration".5

Technology and Europe – how relevant is the topic for the early modern period?

It is not possible to synthesize here the still looming, epoch-transcending relationship between "technology" and "Europe." Rather, the present discussion will be limited to outlining selected technology-induced factors of cohesion in the history of Europe. Emphasis will be placed on the early modern period, a time for which the links between technological developments and Europeanization processes still remain largely unexplored. The hypothesis that processes of technological change represented a cohesive factor of Europeanization processes long before 1850 demands further grounding. To be sure, as already indicated, the research accepts that, until the explicit, technology-related initiatives for unifying Europe from the 1950s, there had been a technologically induced "hidden integration" which began around the 1850s. By the same token, this tends to create the impression that technological developments before this time were irrelevant for Europeanization processes. This was by no means the case, however.

The long-term genesis of technology-induced Europeanization processes can be illustrated quite easily on the basis of well-known examples. While transport and communications infrastructure by railway and telegraph communications (Media Link af) achieved an unprecedented stage of development in the course of the 19th century, the overland transport of goods and people, for instance, through the early modern postal system (Media Link ag) and newly constructed country roads had already led to the acceleration of exchange processes within Europe in the early modern period. Even in the field of early modern military technology (Media Link ah), the introduction of firearms and new ways of building fortifications (Media Link ai) from the late Middle Ages must be recognized as having been the result of comprehensive exchange processes within Europe. This also applies to cultural homogenization processes brought about by the early modern printing press. Its specifically European dimension becomes evident when compared to the more cautious reception of the printing press in the Ottoman Empire or the differing technical procedures and cultural consequences of Chinese book printing. The significance of the printing press can hardly be overstated for giving rise already in the early modern period to a European horizon of experience in relation to technical knowledge. In addition, this development went hand in hand with the emergence of new types of technical literature in the 19th and 20th century.

Efforts to identify dimensions of a technology-induced "hidden integration" in the early modern period also correspond to the reflections on Europeanization processes (Media Link aj) in other areas of early modern studies. Here, too, the fundamental role of new communication structures for an "unintended process of 'Europeanization'' has been accentuated.6
In the following, particular attention will be paid to the underlying conditions in which European processes of technological transfer – which had already existed de facto in antiquity and the Middle Ages – were accelerated, restructured, and increasingly deliberately encouraged in the early modern period. This is especially true for structures that promoted innovative technologies necessary for surviving the unremitting military, economic, and cultural competition of the European territories (Media Link #ak). While such structures were due, on the one hand, to the initiative of European territorial rulers, they were also in force – from a knowledge-historical perspective – in many other domains as well, ranging from correspondence on technological issues in the European "republic of letters" to the discussion of technological innovations in the ever-increasing number of early modern journals (Media Link #al). Overall, this process occurred across geographical, territorial, confessional and linguistic lines, consolidating into an ensemble of European-wide media and institutional conditions that spurred technological change. This development, it must be noted, came long before such lines of connection were made a priority by state actors or transnational companies. Thus, to the extent that this effect was far from intended, it is also possible to speak here of a "hidden" process of homogenization – in short, a "Europe in spite of itself."^7

Individual technology transfer since the late Middle Ages

Although the focus here is on the period after circa 1450, there were certainly already unintended technological developments of European-wide scope in antiquity and the Middle Ages. The centrally governed Roman Empire above all introduced extensive processes of technological transfer – in construction (Media Link #am), for example – though they also always interacted with indigenous developments in the empire’s various provinces. In the Middle Ages, relevant processes of change unfolded in a manner that was administrated far less centrally. They were chiefly sustained through the migration of specialized craftsmen who were an integral part of European-wide economic interdependencies, which only intensified over the course of the early modern period. Even so, the channels of such transfers were by no means evenly distributed across Europe. They were rather increasingly carried out along traditional trade routes and inland and coastal waterways in the economically prosperous central regions of Europe. The wide corridor from Italy over Southern and Upper Germany, France and along the Rhine, via the Netherlands to England, had long been of particular historical importance. ^8

At first, the knowledge associated with these transfer processes remained with its particular carrier. It was then passed along within the scope of an apprenticeship and, not infrequently, lost again. Exchange processes coalesced in handicrafts from the late 14th century through the practice of journeymen migration. During the early modern period, there were also migrations of religious exiles (Media Link #an). At different times, they were deliberately recruited (Media Link #ao) because of their special skills in certain trades (Media Link #ap) and technologies, for instance, for land development in Prussia or to repopulate the Palatinate after the French Wars of Succession. ▲10

Through such migration processes technical expertise spread across Europe, leading to a still very much locally influenced and yet, in its underlying trends, homogenized pool of knowledge and experience in numerous trades. The spread of new technologies like the printing press (Media Link #aq), the mechanical wheel clock or even the cannon molding within a few generations in the core European regions suggests the common ground of these competencies from the late Middle Ages onward. Particularly striking were transfer processes in sectors such as mining (Media Link #ar), where the discovery of new deposits did not always correspond to the necessary expertise for their removal. Linguistic parallels in the miners’ mode of expression, such as in the legal regulations of mountain rights, provide evidence of transfer processes from the Central European mining regions to England or the Balkans (Media Link #as) as early as the Middle Ages.^8

Sometimes such an exchange was also prompted by the transfer of technological objects themselves – for instance, this might have involved handicrafts on a small scale and shipbuilding on a large scale. As the circumnavigation of the Iberian Peninsula was undertaken in the late Middle Ages with ever-greater frequency, diverse ships built according to different Mediterranean traditions increasingly encountered those that were built around North and Baltic Seas in Dutch ports. This gave way to the mutual adoption of the respective characteristic elements of the planking, sails, and other design features.
In the Middle Ages, the deliberate promotion of such transfer processes was largely limited to individual initiatives by city governments or territorial lords. They actively recruited foreign artisans, engineers, and architects by providing attractive conditions such as civil rights or tax breaks. Such measures were increasingly commonplace from the late Middle Ages onward. Important stimuli came from the royal courts in their capacity as cultural centers. Closely intertwined through the European marriage policy (→ Media Link #at), they remained in constant contact with each other, despite their various political disputes. Military and aesthetic competition promoted the transfer of technical experts who held out the promise that certain demands could be fulfilled.

In the 16th century, north of the Alps, it was the attribute of an outstanding architect or engineer to have traveled to Italy (→ Media Link #au) to become educated in the local styles and technologies and, beyond this, to be able to apply them at home. Some of these experts recorded technical installations and structures in travel diaries, published their travelogues after their return and even possessed substantial inventories of technical literature in different European languages. Conversely, many Italian builders and architects took advantage during the same period of the cultural primacy of their homelands in architecture and fortification design in order to hire themselves out for work north of the Alps (→ Media Link #aw) or even in Spain. Although the European-wide circulation and adaptation of architectural styles such as Renaissance and Baroque architecture of the story have been thoroughly investigated, scant attention has been paid to their related implications for Europe as a homogenizing "technological space." Perhaps even more than the creative reception of styles of civil architecture, this is clearly demonstrated by the near-universal adoption in Europe of the bastion fortification, originating in Italy. Despite the wide range of tailor-made solutions, this structure would influence basic forms of defensive architecture up through the 19th century. Examples like these should not only be viewed as aspects of European homogenization, however, for they also entailed processes of exclusion for those territories that could not afford such elaborate systems.

Early modern innovation cultures of European scope

In regard to the migration processes, it is not possible to identify a clear temporal rupture between the Middle Ages and early modern period. Indeed, they would continue to play a central role in the circulation of technological knowledge between European regions well into the period of high industrialization. In contrast, a far more explicit turning point can be detected with respect to the development of media and institutional instruments that stabilized the transfer of technological knowledge and may be described as early modern innovation cultures.

The so-called inventor privileges from the late 15th century were an early example of such a supportive instrument, especially in the area of innovative engineering. This gave rise, in turn, to the patent system in the course of the early modern period. Territorial lords granted bearers of new technological developments protection against unauthorized replication, particularly in the case of more or less identically reproducible mechanical systems such as mills and water-lifting facilities. This legal instrument was not only aimed at enticing inventors from their own territories to make their ideas "public," but also at making the knowledge of "foreign" experts available for one's own realm. This instrument institutionalized an inducement for intra-European technology transfer, but also had a European dimension from the 16th century to the extent that the hope surrounding its positive effects led to its adoption in numerous territories.

Nevertheless, the media revolutions of the early modern period had much more variegated and far-reaching implications for the European-wide homogenization of technological knowledge in its form and content. These only concerned specific forms of knowledge, namely, written and pictorial representations (→ Media Link #ax). The latter included the most well-known example of geometrically constructed perspective drawings (→ Media Link #ay). Printed technical literature and technical drawings thus always only interacted indirectly with technical practice. The relevant conventions, however, were received beyond national boundaries across all of Europe.

This enormous increase of codified technical knowledge in the course of the early modern era shaped cultural norms in a new way. The perception of the "state of technology," for instance, was now no longer constituted solely on the basis of personal experience and personal exchanges, but was also tied to the amount and the structure of mediated information. Collections such as the thriving art
and curiosity cabinets (Media Link #az) from the 16th century contributed to an array of interactions between different types of knowledge. They were installed in a relatively standardized manner in numerous European courts and also often contained technical objects. As a consequence, the travelers of high-standing who visited them were exposed to a "European" horizon of knowledge, which included, for instance, outstanding products of craftsmanship.

Besides these more or less informal practices, more formalized institutional structures were founded, especially in the 18th century. In addition to the scientific academies (Media Link #bo), which also often analyzed technical innovations or processes, these structures included above all educational institutions for technical expertise. These were mostly funded by the state and now stood alongside more conventional technical training opportunities. In this context, it is worth mentioning the engineering schools, which were soon established throughout Europe (primarily on the French model) for the military, infrastructure development, and mining. There were also drawing schools, which, from the 18th century, taught expertise in design and aesthetics with a view to promoting product innovation. Once again, territorial competition played a role in the European core regions, as new firms were frequently tempted to imitate "foreign" models. This had an impact on the formal structure of the training as well as the curriculum and the migration of teachers. At the same time, a need arose in different subjects for textbooks. These, too, circulated throughout Europe, resulting again in a homogenization of the range of topics in different subject areas. The pressure these institutions were under to constantly innovate does not contradict this finding.

Processes relating to the media and institutionally supported "Europeanization" of technical knowledge not only concerned the formation of technical expertise in the early modern period, but also the use and consumption of technology and the perception of product innovation. In consumer culture – which spread from the courts into the broader middle classes during the early modern period – not only were exotic (in the sense of non-European (Media Link #b1)) products in demand such as tea (Media Link #b2), sugar, coffee (Media Link #b3), but so were objects and fashions (Media Link #b4) from European cities such as Paris (Media Link #b5) or London. This regularly led to attempts to imitate or even surpass the respective manufacturing processes and design forms. Besides the objects themselves, an intermediary function for different fashions was played by the expanding periodical culture (Media Link #b6), which helped fuel the spread of related consumer desires throughout Europe.

Overall, there was a shared and consolidating horizon of technological experience in early modern Europe. Indeed, even partially contradictory processes became intertwined, such as the growing practice of industrial espionage in the 18th century, on the one hand, and the exchange of formalized technical knowledge as part of the early modern republic of letters, on the other. News of unprecedented achievements like hot-air balloon rides, which circulated in various media throughout Europe as a kind of meta-narrative, set into motion comprehensive local and regional adaptation processes.

The developments roughly outlined here were themselves, in turn, technically based in a transport infrastructure that was still optimized in the early modern period in terms of solar energy. The systematic expansion of roads for axle-transport with carriages and wagons deserves to be mentioned as much as the related consolidation of the postal service. Only through the increasingly painstaking monitoring of the timing of postal routes was it all possible to bring periodicals and later newspapers to readers at regular intervals. New spatial relationships went hand in hand with these transport infrastructures, as already long-standing trade routes were complemented by additional axes whose postal stations represented local and regional hubs. By and large, these infrastructures contributed to the realignment of these centers and peripheries within the geographical region of "Europe."

It is a topos of European research that Europe has always partly defined itself in terms of its distinction to other cultural spaces. Researchers have only begun to explore the extent to which colonialization and globalization processes (Media Link #b7) during the early modern period led to a perception of specifically "European" technology as compared to that of other cultures. Nonetheless, there is no doubt that differences in the availability of technological artifacts and practices were fully recognized and reflected upon from the both European and non-European points of view (Media Link #b8). It is also clear that, from the European perspective, Europe's own superiority was increasingly emphasized. To be sure, the primacy of Chinese agriculture was at least repeatedly observed in 18th century Europe and touted as a model for corresponding reform programs in a number of European territories. However, since a broader discourse around the term "technology" did not materialize until the 19th century, relevant reflections remained embedded until this time in discourses and terminology concerning trade, industry, consumption, or civilization.
In this context, the debate on the great divergence (carried out in German research under the rubrics of the "European Sonderweg toward industrialization" or "Why Europe?") has yielded little additional understanding to date of the genuinely European dimension of history of technology in the early modern period as compared to China, India or the Ottoman Empire. While technological change is taken here to be as much a core element of stable economic growth as it is the larger process of industrialization, one nevertheless typically finds either rather superficial comparisons of spectacular technical innovations involving Europe and other world regions or the English path toward industrialization is equated as a kind of shorthand with the continent’s overall development.  

Technology and Europeanization in the 19th and 20th century

While the pan-European structures that allowed for the circulation of technical knowledge already consolidated in the course of the early modern period, this trend continued after 1800. Indeed, it was relatively unaffected by the political and social watersheds of the French Revolution and the Napoleonic Wars. Still, the general political and social conditions changed dramatically in the 19th century. This resulted in completely new tiers and opportunities for the transfer of technical objects and technological knowledge. The possible consequences of Europeanization processes may only be indicated here by way of example.

The fact that the actual linkage of European and non-European territories was greatly accelerated through new communication and transportation technologies in the 19th century, in particular the railway and the telegraph, hardly needs further emphasis. This process was not free of controversy, however. In the early days of the railroad, it was possible to see its benefits for transport logistics, especially in military circles. By the same token, the latter were also worried about delivering the enemy a veritable gateway along its own railway track into its territory. Generally speaking, the specific network characteristics of transport and communication technologies subsequently gave rise to a reorganization of geographical spaces, whose stations and hubs, in turn, redefined and channeled paths of exchange. These processes were also active during latter developments in the transport sector, such as the aerospace and automotive sectors in the 20th century. This culminated in a widening of horizons at the consumer level, which, however, was initially reserved for more exclusive social strata.

Moreover, technology-induced Europeanization processes were as a rule not intended. As in the early modern period, they were fueled by the competition of recently established nation-states, which shared a basic developmental orientation toward industrialized modernity. New forums of exchange such as commercial and, starting in 1851, especially world exhibitions helped ensure a more pronounced interest in the performances of the participating nations. Against this backdrop, government initiatives promoting innovation, particularly in the field of formalized technical training, increased with an aim to keep pace with competitors in the area of technical expertise. With respect to more extreme examples, such as the arms race in the course of the First World War, the transfer of knowledge took place at different levels – from espionage to the inspection of destroyed enemy aircraft.

Nationalism and transnationalism thus necessarily always remained closely intertwined and were linked in the most varied constellations. At a political and economic level, it was virtually impossible to ignore the European or international horizon of technological developments. It was even an essential frame of reference for the Nazis, who sought self-sufficiency in their quest for dominance or, for instance, with regard to the technology of jet engines in aircraft or missile technology.

The observation of a "hidden integration" is thus always to be understood as simply an underlying tendency. At the local and individual level, specific appropriation processes of such overarching homogenizing developments could constantly take on new forms, lead to unintended results, or simply be rejected.
Initiatives that where consciously directed at unified European developments began to take shape in the 19th century, especially in matters of normalization and standardization (➡ Media Link #bg). They were critically important for the functioning of cross-border infrastructure such as railways and telegraph networks. The establishment of transnational companies, along the lines of international retail companies (➡ Media Link #bh) and banks, also became an ever-more frequent occurrence from the 19th century.

With the United States' development of its own "technological style," an actor stepped onto the scene for the first time in the 19th century that represented a serious threat to European technologies over the medium term. Before, the superiority of non-European regions (e.g. the Indian textile industry in relation to the English textile industry in the 17th and 18th century) had been limited to individual sectors or specific products (e.g. the Chinese primacy in the production of porcelain). Now, the opportunity for direct comparison heightened the awareness of "European" versus US technology (➡ Media Link #bi). At the same time, the general orientation of technological development was analogous in many respects on both sides of the Atlantic. On this basic level, then, it is increasingly difficult to come up with a clear delineation between "European" and shared "Western" developmental lines. Rather, the colonization processes of the 19th and 20th century tended to reinforce the perception of a growing gap between European-Western and indigenous technologies in the colonies (➡ Media Link #bj). This impression, however, wholly obscures the existing, comprehensive transfer processes of resources and technologies within an increasingly globalized world economy, not to mention the complexity of mutual processes of appropriation. A degree of self-containment can be ascribed to the development in the Soviet Union (➡ Media Link #bk), which was decoupled at the political level from the central European countries and also looked for independent technical solutions. On the other hand, it also followed basic models of European and US technological development.

From a history of knowledge standpoint, the exchange of technical expertise multiplied and accelerated in the 19th and 20th century due to the rapidly growing collection of technical journals and technical research. While approaches to theorizing about technical knowledge had already attracted much attention in the early modern period, there were now further opportunities to relate the expertise of different sectors at the intersection of science and technology as well as to other knowledge traditions. Nevertheless, for technical experts travel remained of great importance for the personal knowledge acquisition, and in the early 20th century the radius of travel also extended in many cases to include the United States (➡ Media Link #bl). In the 20th century, nationally-oriented professional organizations were complemented by European and international professional associations, whose representatives increasingly met each other in person at conferences.

Still, beyond establishing joint technologies, initiatives seldom remained in place for achieving closer European interrelationships with a view to peace-building or fostering economic benefits for all parties – a popular objective from the 19th century onward and later pursued, for example, by the League of Nations (➡ Media Link #bm). Around 1930, the Atlantropa project was perhaps the boldest endeavor in this regard, which envisioned, among other things, generating electricity for European countries by means of a cooperatively constructed reservoir dam at Gibraltar. There were other cases, too, in which transnational technical visions were not necessarily at odds with nationally defined engineering heroes. What is more, the technical utopias in both Europe and the United States often resembled each other in their overall thematic orientation.

Be that as it may, the notion that Europe experienced a "hidden integration" through technological developments remains an apt characterization of the period under consideration here between 1450 and 1950. As already indicated, this process proceeded in a manner that was neither linear nor seamless: The continuous shifting of coalitions between political powers of Europe as well as the disastrous consequences of military conflicts from the Thirty Years' War to the First World War repeatedly shattered existing networks for the exchange of technical expertise. At the same time, this also soon led to new motivations to follow the perceived lead of foreign technological developments.

Outlook

The broad analysis presented here of the European dimension of the history of technology opens up new possibilities for general historical research. In the overall picture of contributing factors, it offers a basis for determining more accurately the significance of technology induced processes that were and continue to be responsible for Europe's formation. It is conceivable that the more
expansive panorama of a global history of technology – which recognizes a historical process of emergence and does not take the
European or Western path toward industrialized modernity as the natural evolutionary course of technology – could more fully flesh
out the specifically European features. Europeanization research, in any case, would undoubtedly gain deeper insights if it were to give
greater emphasis to processes of homogenization – as well as to the concomitant processes of exclusion – brought about by
technological change in the overall picture of Europe's genesis as a cultural space.

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Appendix

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Notes

1. ^ See also the summaries contained in the relevant sections of the five-volume "Propyläen-Technikgeschichte" (Berlin 1990–1992).
3. ^ Many of these works date back to the research network "Tensions of Europe," founded in 1998, in which more than 150 scholars from nearly every European country investigated the mutual relationship between the two thematic dimensions "technology" and "Europe." The varied results can be found in countless articles and essays, anthologies and a forthcoming six-volume summary work (for the latter, see also: Oldenziel / Hård, Consumers 2013; Kohlrausch / Trischler, Building Europe 2014; Kaiser / Schot, Writing the Rules 2014).
5. ^ On the cited terminology, see the programmatic work from Schot, Tensions 2005.
6. ^ See e.g. Zwierlein, Discorso 2006, p. 800.
7. ^ See Popplow, Europa wider Willen 2009.
9. ^ On the complexity of such transfer and appropriation processes in comprehensive detail, see case studies such as Lang, Architekturzeichnung 2012 or Hoppe, Festung 2012.
10. ^ In recent years, attempts have been made from different perspectives to summarize these critical developments in early modern Europe as a relevant ensemble in the history of technology. See Friedel, Improvement 2007, firmly on pp. 7-8; Fox, Arts of Industry 2009; Popplow, Ökonomische Aufklärung 2010, esp. pp. 15-16.
15. ^ See Popplow, Technik als Faktor 2012, or, more recently, the differentiated analysis: Davids, Religion 2013; Vries Ursprünge 2013.
16. ^ In reference to what follows, see in particular the results of the project "Tensions of Europe," from the first programmatic essays (Schot, Tensions 2005) to the current overviews (Oldenziel / Hård, Consumers 2013; Kohlrausch / Trischler, Building Europe 2014; Kaiser / Schot, Writing the Rules 2014) as well as the monographs dedicated to individual sectors and topics and anthologies from the series "Technology and European History" (Amsterdam 2008ff.).

**Link #ac**

**Link #ae**

**Link #af**

**Link #ag**

**Link #ah**

**Link #ai**

**Link #aj**

**Link #ak**

**Link #al**

**Link #am**
Pont du Gard

Bevölkerungstheorie und Konfessionsmigration

Confessional Migration of the Huguenots

The Huguenots Establish Manufactures in Brandenburg

Book Market

Land

Balkans

Dynastic Marriage

Educational Journey, Grand Tour

Alpine Region

Media Genres

Hans Vredeman de Vries (1527–1604), perspective drawing, 1605
**Link #a2**

**Link #b0**

**Link #b1**

**Link #b2**
- Charles Philips (1708–1747), Tea Party at Lord Harrington’s House, St. James, 1730

**Link #b3**
- Public Coffee House, 1750/1800

**Link #b4**

**Link #b5**
- La Déclaration de l’Amour 1731

**Link #b6**
- Types of journals in Germany 1682–1830

**Link #b7**

**Link #b8**

**Link #b9**
Link #ba

Link #bb

Link #bd

Link #bf

Link #bg

Link #bh

Link #bi

Link #bj

Link #bk

Link #bl

Link #bm

http://www.ieg-ego.eu ISSN 2192-7405