HOW HISTORY MEETS THE TECHNOLOGICAL WORLD –
ENGINEERING, RESEARCH AND DEVELOPMENT AND THE HISTORY OF TECHNOLOGY

Keskiviikkona ja torstaina 20. ja 21. syyskuuta 2000 järjestivät Tekniikan Historian Seura THS ry, Teknillistieteelliset Akatemiat Facte, Tekniikan Akateemisten Liitto TEK, Helsingin Insinöörit HI Ry, Suomen Akatemia ja Polyteekkarimuseo seminaarin, jonka tarkoituksena oli vahvistaa tekniikan ja teknologian historian tutkijoiden välistä vuorovaikutusta ja laajentaa alalta käytävää keskustelua.

Päätilaisuus järjestettiin Tieteiden Talolla Helsingissä. Tilaisuuteen osallistui noin 40 henkilöä. Seminaariin liittyi myös dipl.ins. Lars Hukkisen isännöimä illallistilaisuus ravintola Zinnkellerissä ja professori Ulrich Wengenrothin vetämä jatko-opiskelijaseminaari Polyteekkarimuseolla Otaniemessä. Tässä numerossa julkaistaan kolme seminaarissa pidettyä alustusta.

Panu Nykänen, seminaarin projektisihteeri

CULTURAL HISTORY OF TECHNOLOGY

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As a branch of academic education and research, cultural history has still a short background in Finland. Founded in 1972, the Department of Cultural History at the University of Turku, is the only one of its kind in the country. During recent years, a lively interest in the history of technology has arisen among the department students and staff. Simultaneously, it has become important to attempt to define how we understand the role of culture and history in the study of technology. This article aims to clarify our views on the aspects of writing and investigating cultural history of technology.

Cultural and History: Cultural History

Cultural history has sometimes been defined as a study of those ideas, actions, plans, emotions, or mental equipment through which the men and women of the past were in interaction with their environment.[1] This interaction, or communication, is not necessarily conscious; it can well be automatic, unintended communicative reactions of an emotional and a sensitive human being. Marshall McLuhan once saw technology as an extension of the

senses, as an electric skin.[2] Notwithstanding our view on McLuhan's sometimes provocative thoughts, technology has certainly played an important role as a means and forum of human communication, even though it has quite often been overlooked when writing about the human past.[3] Thus, it is well-suited to the main ideas of a cultural historian.

In sum, cultural history defines culture broadly as communication. This means that we try to see the men and women of the past in their wider context, how they interacted with each other and with their social surrounding. Obviously, a special emphasis is often placed on the history of everyday life, on the way how people formed their lifestyles and shaped their living conditions, how they thought and felt in the everyday context of the past. As well as the so-called new cultural history, we also stress the role of mentalities and emotions. Considering that the earlier intellectual history often saw the people of the past as being consciously behaving thinkers, it is necessary to try to figure out what kind of automatic patterns of thought and reaction they had, and what kind of mentalities and emotional equipment they shared with each other.

In addition to "culture", we have another important concept, "history". Traditionally, historians have defined their scholarly field as being something that no longer exists: they study processes that have ended and do not exist in the present day society (which is left for social scientists). During the recent decades, this traditional division has been put under question and, simultaneously, the social scientists have shown an interest in the historical approach. If we agree that history is temporarily a complex and a multilayered process, it is not at all simple to judge whether a process has ended or not. This means that one should be able to study not only remote, temporarily distant phenomena, in the way historians traditionally have done, but also cultural problems of the present day. History can be analyzed as traditions that have not disappeared but are still living. This emphasis on historical culture, or Geschichtskultur, is an important aspect in the work of the cultural historian and widens the way we understand history in general.

Cultural History of Technology – What it could be?

Let us now focus on the activities around the history of technology at the Department of Cultural History. Right from the start, the practical attitude or practicality has been the key issue of interest. This can be seen notably from the early 1990's when Heikki Lempa, Tapio Onnela and Hannu Salmi started to build Internet applications for historians, first with the Gopher and e-mail based environments, then onto the World Wide Web. For example, the current discussion list *H-verkko*[4], and the Internet site *Agricola – The Finnish History Network*[5] were built on the basis of this work.

What type of media and information technologies were used, constructed, and interpreted in the daily work of

historians who were connected with the Internet? This question required answers. Interested in technology as an assistant of everyday work, historians wanted to deepen their understanding and started to seriously think how to approach technology with the tools of historical research. The first steps in the field of the history of technology were, of course, quite shaky, because there was not much local knowledge of the subject and its key issues and methods – particularly because the goal was to define the cultural historical approach towards technology.

At present, cultural history of technology has not yet established any broad or stable position in Turku, even though we have a small informal research group on technology. It most certainly takes time to obtain your own space inside the department, not to talk about a place in national and international networks. In Turku, only a few courses and lectures have been organized on the history of technology, and it appears that the students of cultural history somehow still disapprove the word "technology" which is interpreted by them only at the nuts-and-bolts-level of technical artefacts. Thus, at this stage, the key issue is to break boundaries and to make it known that the cultural history of technology is something other, something important and interesting.[6]

How do we, then, comprehend the word "technology" and how do we want others to understand it? As you may notice, our broad definition of "culture" leads to a broad definition of technology as well. Our definitions of technology are related to Karl-Erik Michelsen's and other Finnish scholars' interpretations.[7] In the cultural historical point of view, technology can apparently be seen as human ways that are used to sketch, to shape, and to control the world around us. In this endeavour, it is important not to concentrate only on the "material aspects" of technology such as machines, equipments, tools, and their using techniques, or on the system builders and innovators in a traditional way. It is equally important to notice the different kinds of conceptual, linguistic, imaginary, and mental aspects of technology. Thus, the definitions of culture and technology are very close to each other.[8] Therefore – as perviously mentioned – the Department of Cultural History is quite a natural place to explore history of technology.

It is difficult to summarize the key issues and focal points of the cultural history of technology, because everything, in the end, depends on a particular scholar and his/her starting points. There are, however, certain main areas which are related to the main research areas of the department, such as the history of mentalities and emotions, the history of everyday life, popular culture and consumption. Also the so-called public history or historical culture, i.e., the presence of history in our cultural environment, form a central issue. Therefore, the cultural historian does not necessarily directly explore the traditionally defined producers of technology such as scientists, engineers, inventors or innovators, but how technology is produced in the domestic and every day contexts or in the imaginary situations.[9]

Obviously, the viewpoints mentioned, lead to different theories, methods and

sources. A cultural historian often uses various types of primary sources, memoirs and archival material together with films, popular magazines and newspaper articles, comic strips, cartoons, and fictitious literature. The sources are not valorized according to how near to technological research or development have they been produced. The sources are not categorized either on the basis of their "truth" value.

Cultural history also means – as do science and technology studies in general – that approaches and methods are multidisciplinary. It depends on the research case if this means for example work with methods of natural or technical science, social sciences, economy, media studies, cultural studies, anthropology, art or all intertwined. An example of the multidisciplinary field is the explorations of the economy scientist Mika Pantzar whose historical studies of technology and consumption[10] are very close to cultural historical approach.

It has sometimes been argued that these methods, using various source materials and theoretical approaches, have a vague focus and make it impossible to conclude the research projects. This is not the case. The issue is, as always in the study of history, how to choose the research topic, relevant questions, sources, and methods.

Deconstructing Modern Myths

The history of technology can in many respects be parallelled with some other specialized histories, for example, with the history of art and the history of cinema. As with these histories having their tradition of great artists and great directors, the history of technology has its inventors and engineers, or at least their roles have been emphasized. The masterpiece tradition, so typical of earlier art history, also has its equivalent, i.e., the machines that tend to capture a central position in the history of technology.[11] While in art history, the works of art often seem to give birth to new masterpieces, almost without a human touch, in the history of technology, there are narratives, although criticized ones, arguing that machines create machines.

These are examples of how technology has been mythologized. It is, of course, not fair to put forward these ideas without emphasizing that, today, the history of technology is a much more complex issue, and not merely an arena of inventors and machines only. But there certainly are myths that still have an influence. According to our views, the cultural historian should be conscious not only of technology but also of its history as a cultural construction.

Often these myths are extremely strong narratives that have been established either by historians or by journalists in publicity. Let us give an example. In 1995, the 100th anniversary of cinema was widely celebrated in the Western countries, even though there were serious doubts concerning the invention of cinematography in 1895. During this celebration, numerous journals and newspapers repeated the old idea that the French Lumière brothers were the inventors of cinema. Historians of film technology have already for decades argued that the birth

of film making was not at all as simple as that. During the 1890s, there were many film pioneers that contributed in the development of the field. We should, at least, mention the names of the Skladanowsky brothers in Germany, Robert W. Paul and Birt Acres in England, Thomas A. Edison in the USA, and Filoteo Alberini in Italy. The position of the Lumière brothers was probably established by the French film historians during the 1930s. The early film enthusiasts who wrote the pioneering film histories, were influenced by French ideas, and, therefore, they started to recycle the myth in their own books.

In addition to this critique, one might add that the concept of film should, in the first place, be reconsidered. Before cinema, there were numerous technologies of moving images, some of them contributed to the invention of cinematography, some of them deserve attention in their own right. Furthermore, there were many different roots to follow, technological aspects of production, exhibition and distribution of film that are all important for the scholar.[12]

Technological and Historical Narratives: Questions of Continuity and Discontinuity

In the history of technology, the same kind of definitions of being the first, are still alive. In Finland, amongst other things, there has been discussion, when and where was the first automobile in our country actually used. One can certainly raise the question, why this firstness is and has been so important in the history of technology. Firstly, it has been used when new technology has been introduced and, secondly, when the histories of technology have been written. Thus, one way to examine the cultural history of technology is indeed to concentrate on the narratives of technologies.[13]

Cultural historical narrative research can be defined as being research that aims to classify, to explore and to put into context technological narratives in general, or maybe more narrowly to study the changing ways of presenting the history of technology. In both cases, we have to deal with a central issue of historical research and history writing. That is the question of contingency or discontinuity.

One can probably say that in the history of technology, new and revolutionary aspects are often underlined. There are studies of the first cars, steam engines, computers and their inventors. The idea of the later success and importance of the breakthrough of new technology has been written in the stories. But today it seems that the most popular narrative in the history is to emphasize continuity. There are many studies which argue that the revolution or rupture, illustrated in the early studies or writings in general, has been something else: either there has been no rupture, or it has taken a longer time, or it has happened only in certain special occasions.

The new interpretation of continuity can also be applied to the history of computing. First, in the computing and in the new (!) information technological narratives, computers have determi-

nistically been described as being revolutionary and totally new innovations. Computers have been seen as revolutionizers of scientific calculations, office work and life in general. But, in the latest studies of history of computing, it has been pointed out that the change has not been internal and that it has not been so complete. It has been argued that, in the beginning, the digital computing or electronic data processing did not mean such a massive change in computing. Earlier techniques and tools of data processing basically held their position for a long time. The change occurred slowly and took place in many kinds of cultural processes of interaction.[14]

Cultural historians wish to add some more aspects to this notion of continuity: technical innovations and their usage have changed more slowly, the way to talk, to present and to represent technology has changed little by little in various connections. Rhetorically, the way to introduce and to present the new computers from the 1940's onwards has always followed and applied the earlier habits of introducing technology. The way to talk and to present new technology has been quite familiar – connected to other fields of life, other technologies, and earlier patterns of presenting computing.

An example. One strategy or discourse on the new computing in the 1950's can be called "the safe change rhetoric".[15] In the stories of computing, the major users or vendors of equipment strove to stress the importance of the machines and their functions. The new technology was presented to play a key role in the progress. At the same time, the users and vendors wanted to underline the positive aspects and safeness of producing the big jump ahead, the change. Nothing bad was supposed to come in this way. The calculating machine, "electric brain" as it was called in the most popular discourses, was not really – at least not yet – capable to think or to feel like a human being. It was only a mechanic idiot who needed a human to give it orders. Everybody did not, however, believe in the safe change rhetoric. One of the primary fears in popular discourses was the idea of machines that make errors and use their thinking abilities against the mankind.

One can find similar newness, hopes, fears and rhetoric strategies in the other technical innovations. It can, then, be assumed that the safe change rhetoric or the fear of uncontrolled machines are characteristic of the situation when new technology is negotiated in cultural processes. Nevertheless, it is false to claim that technology and its narratives are always the same, irrespective of time and space. For example, the safe change rhetoric always finds its expression in the historical situation and context. In order to explain this, we can use another concept, introduced by Cecelia Tichi[16] and Lynn Spigel[17], two scholars of television. This concept is the "electronic hearth". It is a metaphor illustrating American television in the 1940's and 1950's. It refers to a theme or style to present the television set as the key element in keeping the nuclear family together. The tv set had an effect similar to the fireplace in the age of the American frontier. With the electronic hearth, for example, Tichi and Spigel

have noticed that, even though technologies are presented usually as fast changing elements, they (and their presentation) carry along some long term ideological structures, habits to define and to produce technology itself as well as family, home and gender roles.

A similar idea of the electronic hearth can be traced to later technical innovations connected to tv, such as television arcade games, home computers or Internet televisions. Domestic elements can be alive (a machine bringing family together), but technical artefacts and family relationships have changed. "The new hearth" is more interactive, or interactive in different ways and the user family consists not necessarily of a father, a mother, a son and a daughter but of a young female with a pet or lone father with his daughter.[15] We are subscribed to the idea that the historian can, therefore, examine for example, relationships between these changing and unchanging cultural elements and motifs.

The Problem of Temporality

As the earlier examples suggest, one essential feature of the cultural historical approach can be linked with the idea of temporality. History is not anymore seen as a linear process, a simple flow of events from the past to the future. Historians' ideas have strongly been influenced by the French historian Fernand Braudel who, in his groundbreaking study of the sixteenth-century Mediterranean world, saw history as a polyphony of different temporal rhythms. For Braudel, there was a slowly changing time of nature and geography, the longue durée, as he called it. Secondly, there was a somewhat quicker time that became visible in the changes of social life. And, thirdly, there was the rapid change of politics, the short-term time that created the continuously changing surface of the temporal landscape.[19]

Surely, we can recognize these simultaneous, transparent temporalities in the history of technology as well. The production, reception and consumption of technology often seem to live in different rhythms. It can only be mentioned that already the diffusion of technology creates dynamics worth while considering. A general survey of the history of technology might argue that, in 1877, Thomas A. Edison invented a phonograph or that, in 1965, Sony launched the first portable video camera to the market. In fact, technology, and cultural products in general, are always specific in temporal and spatial terms. This situatedness means that these products communicate differently in different cultural conditions.

Let us take an example from the history of Finnish mobilization. As is well known, cars and other motor vehicles have been seen and used in Finland since the turn of the 20th century, but the number of cars started really to increase from the 1920s onwards. There was, however, a highly interesting three-year period before the first world war, about from 1911 to 1914. In 1911, motor traffic seemed to increase rapidly, but this development was abruptly broken after a couple of years.[20] The traditional historian's view, concen-

trating on "what really happened" would, perhaps, recognize the changing relationship to technology in terms of how the amount of registered cars changed. It seems, however, that motor vehicles were received mentally much earlier before they really appeared in the Finnish landscape. This imaginary or emotional response was influenced, first of all, by the media. In particular, early films showed automobiles that terrorized urban environment. Furthermore, the fear of cars increased because of the speculations about how the mobilization would develop in the future. In this sense, technology was temporal by its very nature; it was not evaluated according to what was at hand, according to what was already there in the Finnish society, but how its impact was estimated to develop in the future. This means that, in understanding technology as a cultural construction, temporality is of great importance.

Producing and Receiving Technology

The question of temporality is sometimes linked with the production and consumption of technology, too, simply because production is seen to precede reception. It can, of course, be argued that this idea does not really give justice to the complexity of technological processes. Although cultural history is strongly interested in culture as communication, this does not mean that we would emphasize only reception, the consumptive aspects of technological culture. Perhaps the most fertile starting point would be to see production and consumption as an inseparable whole where the counterparts are fused together into something that cannot be clearly divided. Or, to be more precise, there are no general grounds for isolating production and consumption: their relationship should be evaluated separately in each case.

The cultural history of technology would, in our opinion, put forward simultaneously both sides of the coin and, thus, be able to see more nuances in the ways technology negotiates with the community of a particular time and place. In recent technological research, scholars have emphasized the many-sidedness of the reception of technology. A user is not a passive recipient, isolated from the production and cultural construction of technology. Nor is production totally a process of innovation without users. It can be argued, for example, that Internet was never planned to be what it came to be: it was born out of a complex negotiation between different partners. Of course, there are some rough examples of the interrelationship between production and consumption. In the history of automobile accidents, it seems apparent that users (often becoming non-users in an accident!) have had an impact on the whole industry. Obviously, this is an exceptional example because of the lethal consequences of usage, but the point becomes effectively clear.

Michel de Certeau, the famous French scholar of everyday life, has strongly rejected the idea of passive reception and stressed the role of consumption as creative adaption.[21] Perhaps, in this sense, the recipient of

technology can be interpreted as an agent situated in various contexts of media applicability and technological comprehension, not readily agreeing or opposing but constantly negotiating between technological discourses and personal histories. The cultural history of technology, thus, contributes to how these negotiations have finally occurred in particular time and place and how this communication influenced other forms of cultural activity.

[1] Virtanen 1993, 9-18.
[2] McLuhan 1968.
[3] Michelsen 2000.
[4] See http://http://www.utu.fi/hum/historia/hverkko/.
[5] See http://www.utu.fi/agricola/.
[6] See also Suominen 1999.
[7] Michelsen 1987, 187–188.
[8] Suominen 2000, 21-23.
[9] Salmi 1996; Suominen 2000b. For historical studies related to innovation processes, see Hyysalo 2000; Paju 1999.
[10] Pantzar 1996; 2000.
[11] cf. Salmi 1993, 19-27.
[12] Musser 1990, 15-54.
[13] See for example Nye 1997; Wise 1997.
[14] See for example Cortada 1993, Campbell-Kelly & Aspray 1996.
[15] Suominen 2000b, 102.
[16] Tichi 1991.
[17] Spigel 1992.
[18] Suominen 2000a.
[19] Salmi 1993, 43-44.
[20] Kaitanen & Salmi 2000.
[21] de Certeau 1998.

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