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Zukunftstechnologien der letzten Jahrhundertwende: Intentionen – Vision – Wirklichkeit

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Abstracts

I. Abhandlungen und Studien

Peter Hertner, Die Stoffe, aus denen die Träume wurden: Zukunftstechnologien der Jahrhundertwende. Aluminium und Kunstseide als Beispiel

Abstract

Following the evolution of economic theory economic historians have, as it seems, paid more attention to the innovation of the production process than to the creation of new products as such. A look at historical development tells us that in most cases there was no straight forward move from the invention of a new product to its successful diffusion in the market and, in the case of consumer goods, to its becoming part of mass consumption. This is certainly also true for the new science-based industries which sprang up during the so-called Second Industrial Revolution starting from the 1880s. Two specific products - aluminum and "artificial silk" - have been selected for this article. Their history until the First World War should tell us something about the intricacies of invention and innovation in the longer run. When aluminum was at first produced at the end of the 1850s its price was not far from the price of silver. It remained expensive, and its use therefore limited mostly to luxury items, during the following three decades. Thanks to the invention of the electrolytic process by Hall and Héroult in 1886 aluminum became much cheaper and managed to conquer new markets after 1900, such as airship and airplane construction, high voltage cables, aluminum foils and even coins made out of aluminum. These new developments had, in the eyes of many observers, become the technology of the future a few years before the outbreak of World War I, but their overall importance became evident only during the war and the following decade. "Artificial silk", as it was called by contemporaries, is another interesting case in kind: Starting from the 1880s four different production processes developed during the following two decades. In each case the final product was also different but all of them had to compare with the qualities and defaults of natural silk. "Artificial silk" was, generally speaking, brighter and cheaper than its erstwhile competitor. Both products, aluminum and artificial silk, had to pass through long experimental phases. Their coming of maturity depended on collateral and supplementary process innovations which were, for the first time, science-based. The fact that by early 1920s research and development in both branches took place in corporate laboratories did not mean, however, that in the meantime the complex process of invention and innovation had been shortened. It remained as unforeseeable as ever before.

Dieter Schott, Das Zeitalter der Elektrizität: Visionen – Potentiale – Realitäten

Abstract

Electricity was one of the technologies that engaged and enticed the imagination of the contemporaries in the late 19th century to a large degree. This paper aims to show the broad range of visions and aspirations inspired by technical progress in electrical engineering and the close connections of those visions to contemporary social thinking and social criticism. Using the "Internationale Elektrotechnische Ausstellung" in Frankfurt/Main 1892 as an example the far-reaching potential of electrical power transmission is demonstrated as it then

inspired leading politicians on the national and local level like Johannes Miquel, then secretary of finance in the imperial government. Electricity was seen by them as a panacea to the evils of overpopulated industrial cities, to the apparently inevitable decline of the small artisan. The electric engine seemed to offer a technical solution to this social and economic problem. This very influential and widely shared social criticism is then situated into the context of more general "Zivilisationskritik" of the "turn-of-the-century" German empire. In the second part of the paper the potential, the different applications of electrical engineering are being discussed: A more modern and safer light, a more flexible and easy-to-handle source of stationary as well as mobile power, a catalysing agent for chemical processes and a means of greatly enhancing volume and scope of interpersonal communication. The new "Age of Electricity" seemed to hold the potential to solve problems of a wide array of multiple crisis, social, hygienic as well as environmental. At the same time electricity also held a special cultural appeal of being an immaterial, fairylike, somehow spiritual force, pure energy as opposed to "matter". The third sections contrasts visions and realities of electrification, noting that electricity did not - generally speaking - "save" the small artisan, that it was predominantly put to use by large industrial corporations and not the artisan, that electricity served - at least for the early phases of diffusion - as a symbol of social distinction rather than equalisation. Thus in the final section the visions about electricity of the end of the 19th century are analysed as projections and mental constructions of social concepts onto the field of technology.

Christoph Asendorf, Die Luftfahrt und der Wandel ästhetischer Leitvorstellungen um 1910

Abstract

In the period around 1910, long before the beginning of passenger transportation, aviation entered the general public awareness with the help of spectacular long-distance flights and mass rallies. These years were also of vital importance to the history of modern art. The question is whether and in which ways technical developments had an influence on artistic innovation. The works of some of the most prominent painters of the time, such as Robert Delaunay or Kasimir Malevich, attest to an intense interest in aviation which gradually transformed their artistic strategies. The developments in both fields coincide with a new dynamic relationship to space.

Kurt Möser, Amphibien, Landschiffe, Flugautos – utopische Fahrzeuge der Jahrhundertwende und die Durchsetzung des Benzinautomobils

Abstract

At the turn of the century the motor car was regarded as the epitome of the adventurous individual mobility machine. But with airships and aeroplanes strong competitors appeared. Many fictional texts introduced phantastic vehicles. Typical examples were the diving and flying machines or the zoomorphic cross-country vehicles of Jules Verne's novels. Real "cross-over" vehicles appeared, too: Engineers experimented to combine several contemporary vehicle technologies and new power concepts, e.g. turbines, aiming to "conquer" area and space completely. As a consequence the motor car, being confined to the linearity of the road, got into a defensive position, losing its image of "cutting edge modernity" to real and fictional vehicles with higher mobility capabilities. But all these individual mobility machines fitted into a social context of aggression, danger, and dandyism which helped the motor car to be accepted. The interest of the military authorities in cross-country, submersible, and amphibious vehicles is another important context. In order to

reestablish the necessary mobility and to gain independence from roads experimental vehicles were developed. These and other utopian vehicles therefore helped to prepare for the mechanized total battlefield of the First World War.

Arne Andersen, Chemie als Zukunftstechnologie. Teerfarbenindustrie vor dem Ersten Weltkrieg

Abstract

In the beginning of the 20th century the chemical industry was one of the most prosperous and rapid growing industries of the German Kaiserreich. But not the economic success guaranteed the chemistry the leading part in visions of future in Germany. There were two arguments, which should be appear as decisive: The development of the German organic chemistry, especially the dye industry, leads to surrender of the French Krupp and the British Indigo cultivations in India. The British chemical industry was the first major new-technology to be outcompeted by Germany. The Kaiserreich became the leading nation in this industry and strengthened the belief in the absolute German superiority. Secondly the (organic) chemistry demonstrated the society's dominion of nature. In its view the chemical industry succeeded in perfecting nature with syntheses and a beginning variety of products, and with that it established the idea of the total creation of the earth.