

# ELEMENTS OF SCREENOLOGY: TOWARD AN ARCHAEOLOGY OF THE SCREEN

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A covered framework, partition, or curtain, either movable or fixed, which serves to protect from the heat of the sun or of a fire, from rain, wind, or cold, or from other inconvenience or danger, or to shelter from observation, conceal, shut off the view, or secure privacy; as, a fire-screen; a folding-screen; a window-screen, etc.; hence, such a covered framework, curtain, etc., used for some other purpose; as, a screen upon which images may be cast by a magic lantern; in general, and shelter or means of concealment.

*Definition of 'screen', The Century Dictionary and Cyclopedia [1889], 1911.*

An increasing part of our daily lives is spent staring at screens.<sup>1</sup> Some of them, like cinema screens and giant outdoor displays, are public, while others are part of our privacy. Since the mid twentieth century, television screens have become a permanent feature of millions of households around the globe. Today's 'TV culture' may seem global and homogeneous, yet the cultural role and even the 'nature' of the TV screen has been in constant flux, effected by changes in technology, social practices, broadcasting policies and design philosophies, as well as by new peripherals like videogame consoles, VCR's, digital recorders and set top boxes for on-line network communication. Since the late 1970s the display of the personal computer has began to compete for attention with the TV screen. These two have often been said to be in the process of converging into a single multimedia terminal. However, the traditional distinction between 'big screens' and 'small screens', often thought to coincide with the divide between 'public' and 'private', remains a common scheme in popular accounts of media culture. Yet even its validity has been questioned by scholars and critics. In her book *Ambient Television*, Anna McCarthy points out that associating the TV set merely with the domestic context is misleading.<sup>2</sup> TV screens, both large and small, have long and manifold histories in all kinds of public spaces, as well as in various intermediate spaces. The same broadcast may traverse all these spaces, while an enormous variety of other programs, both on-line and off-line, is also present. A design for

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- 1 A longer version of this text was originally published in *ICONICS: International Studies of the Modern Image* (Tokyo: The Japan Society of Image Arts and Sciences), Vol. 7, 2004, pp. 31-82. The title of the text is a playful reference to Roland Barthes's seminal *Elements of Semiology* (1964). Barthes attempted to delineate the principles of a new field, semiology or semiotics, while the present study proposed another new field, 'screenology'.
  - 2 McCarthy, Anna: *Ambient Television. Visual Culture and Public Space*, Durham/London 2001.

the automobile of the future would be unthinkable without the presence of an entire variety of screens.<sup>3</sup>

An even better example of the need to revise existing ideas about the cultural role of screens is provided by the growing importance of personal nomadic mobile screens. Devices like mobile phones, portable game consoles, PDA's (personal digital assistants) and camcorders with their foldout liquid crystal displays do not fit easily within existing schemes. Their tiny screens are much smaller than those of normal television sets or personal computers. As portables they constantly cross the threshold between private and public, going where their users go, entering and leaving homes, cafes and offices, transported from place to place in technological prostheses – cars, trains, and intercontinental jets (the jets, of course, offer a variety of screens as well). The miniaturized screens display huge amounts of rapidly changing images, graphics and text. In spite of their minuscule size, they are often further divided into 'software screens'. An intuitive, almost real-time relationship develops between the user's fingers and the streams of data traversing one's palm. Handheld devices are personal, attached to the body of the user like clothing, jewellery or the wallet (a portable no-tech multimedia center with photographs, phone numbers, credit cards, etc.). We leave our TV sets and PlayStations behind from time to time, but portable small screens have become permanent extensions of the user-owner's body. Even smaller screens are constantly being developed and implemented into ultra-slim digital cameras, cell phones, wrist-TVs, tele-jewellery and other devices.<sup>4</sup>

As the importance of screens in contemporary media practices increases, the task of understanding their cultural roles becomes urgent. Yet in addition to their present manifestations, we also need to understand their earlier forms and the ways in which they have developed. I would like to propose the creation of a new field of research which would be called 'screenology'. It would be a specific branch within media studies focusing on screens as 'information surfaces'. The focus should not be only on screens as designed artifacts, but also on their uses, their intermedial relations with other cultural forms and on the discourses that have enveloped them in different times and places. Some useful groundwork, illuminating various aspects of screens, has already been done. This includes the theories on the cinematic apparatus, Charles Musser's investigations of early cinema within the "history of screen practice", Siegfried Zielinski's media archaeological research on the historical dialectic between cinema and television, Margaret Morse's work on TV screens as gateways into virtual realities, David Morley's anthropology of the television set, Lev Manovich's studies on the

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3 See Naughton, Keith: "Living Room, to Go", in: *Newsweek*, Nov. 25, 2002, pp. 62-66.

4 The latest Japanese 'keitai' (3-G cell phones) with video cameras now have two screens: the usual one and an even smaller one on the outside of the folding phone, next to the camera lens. One reason seems to be to prevent the user from taking snapshots without being 'caught in the act'. The sound effect that accompanied the snapshot in earlier models was probably not enough.

genealogy of the computer screen and Anne Friedberg's work on screens as "virtual windows".<sup>5</sup> Additional insights may be found from theories of visual culture, particularly from texts dealing with visual representation and the cultural contextualization of images. To venture a tentative definition, screenology would be a way of relating different types of screens to each other and assessing their significance within changing cultural, social and ideological frames of reference.

This article argues that the meaning of the screens in contemporary media culture cannot be fully grasped without exploring their antecedents and (re-) placing these within the contexts of their own times. The approach is media-archaeological.<sup>6</sup> As it is understood here, media archaeology purports to show that from behind phenomena that may at first look seem unprecedented and futuristic we often find patterns and schemata that have appeared in earlier contexts. Accordingly, the discourses on screens often evoke topics and formulas that derive from existing cultural repertoires (although this may not always be evident to the cultural subjects themselves). The vicissitudes of screens as realized artifacts and as discursive manifestations do not always coincide. It might be claimed that screens as discursive notions sometimes anticipate their practical realization, although anticipations are not always fulfilled as expected by cultural agents. Seen from such a perspective, 'screen' is a complex cultural phenomenon that avoids easy generalization. Media archaeology helps tracing its outlines and its layered historical manifestations. By excavating the past, media archaeology also sheds light on the present. It does not aim to belittle the evident cultural changes brought forth by social and cultural phenomena such as the massive use of mobile phones or the emergence of electronic gaming. Yet, uncritical emphasis on novelty and innovation only may be misleading. By mapping phenomena claimed to be 'without precedent' within wider cultural frames of reference we may be

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- 5 The notion of apparatus comes from cinema studies: it comprises not only the technical system, but also the elements of the viewing situation, including the relationship between the screen and the viewer, which is both physical and imaginary. For apparatus theories, see De Lauretis, Teresa/Heath, Stephen (Eds.): *The Cinematic Apparatus*, London/Basingstoke 1980; Zielinski, Siegfried: *Audiovisions. Cinema and Television as Entr'actes in History* [1998], translated by Gloria Custance, Amsterdam 1999; Morse, Margaret: *Virtualities. Television, Media Art, and Cyberculture*, Bloomington, Ind. 1998, pp. 71-98; Manovich, Lev: "Towards an Archaeology of the Computer Screen", in: Elsaesser, Thomas/Hoffmann, Kay (Eds.): *Cinema Futures: Cain, Abel or Cable? The Screen Arts in the Digital Age*, Amsterdam 1998, pp. 27-43 and Manovich, Lev: *The Language of New Media*, Cambridge, Mass. 2001, pp. 94-111; Friedberg, Anne: *The Virtual Window: From Alberti to Microsoft*, Cambridge, Mass. 2006 (forthcoming).
  - 6 For Siegfried Zielinski media archaeology is an approach "which in a pragmatic perspective means to dig out secret paths in history, which might help us find our way into the future" (Zielinski, Siegfried: "Media Archaeology", in: Kroker, Arthur/Kroker, Marilouise (Eds.): *Digital Delirium*, New York 1997, p. 274. In general terms I share the same goal. For my own definition of media archaeology, see my "From Kaleidoscomaniac to Cybernerd. Notes Toward an Archeology of Media", in: Druckrey, Timothy (Ed.): *Electronic Culture. Technology and Visual Representation*, New York 1996, pp. 296-303, 425-427.

able to penetrate beyond marketing slogans and clichés perpetuated by popular media. Identifying the conventional and the inherited also helps us appreciate true innovation and originality.

I will first explore the etymology of the word ‘screen’, outlining the migration of its meanings. I will then briefly explore the emergence of public screen practices, such as the Phantasmagoria and the magic lantern show. After this I will concentrate on the archaeology of the ‘small screen’, excavating the various ways and forms in which it entered the domestic sphere. The discussions are not meant as the final word about the topic. Rather, I am offering a series of speculations supported by historical evidence. The nature of the investigation is largely iconographical – I will excavate manifestations of the screen as they appear in visual representations, and match them up with other sources. The approach is justified by the lack of literary sources on many of the issues I am dealing with. Some omissions have been unavoidable. Certain issues, like the idea of displaying framed images both in private and in public contexts, have been treated only in passing. Although the historical imaginary around the display of paintings contains instances of representations stepping ‘out of the frame’ and mingling with humans, I have chosen to concentrate here on ‘proto-screens’ that are more closely connected with technological developments. I will not limit my investigation to material things. Following the path taken by cultural historians like Walter Benjamin, Wolfgang Schivelbusch and Carolyn Marvin, I consider imaginary and discursive manifestations of culture as real and important as materialized ones.<sup>7</sup> The history of the screen fluctuates between the imagination and the world of things. As gateways to displaying and exchanging information, screens are situated in the liminal zone between the material and the immaterial, the real and the virtual.

## I ‘SCREEN’: ETYMOLOGIES AND SEMANTIC SHIFTS

A screen can be tentatively defined as an ‘information surface’. This is deliberately vague. Although screens are two-dimensional surfaces, they often give us an impression of a three-dimensional reality somehow accessible through the screen. Screens are also framed, which metaphorically associates them with paintings or windows – a screen is often conceived as a kind of virtual window opening to a mediated realm. As Vilém Flusser has remarked, screens also have some characteristics of the door – they let us ‘enter’ the realm they depict.<sup>8</sup> This is particularly

7 See, for example, Benjamin, Walter: *Charles Baudelaire. A Lyric Poet In The Era Of High Capitalism*, translated by Harry Cohn, London 1983; Schivelbusch, Wolfgang: *Disenchanted Night: The Industrialization of Light in the Nineteenth Century*, Berkeley 1988; Marvin, Carolyn: *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century*, New York/Oxford 1988.

8 Flusser, Vilém: “Two approaches to the Phenomenon, Television”, in: Davis, Douglas/Simmons, Allison (Eds.) *The New Television: A Public/Private Art*, Cambridge, Mass. 1977, pp. 234-247.

the case with interactive screens, but applies more metaphorically to other types of screens too. Lev Manovich has made a historical classification of three types of screens: (1) the classical screen that “displays a static, permanent image” (a framed painting, for example), (2) the dynamic screen which “displays a moving image of the past” (as the cinema screen) and (3) the real-time screen, which “shows the present” (obviously meaning the TV screen, the radar screen and the computer screen).<sup>9</sup> Manovich’s classification is problematic. In another place he claims that the dynamic screen “is the screen of cinema, television, video”. Yet the television screen is basically a “real-time screen”, although it may also display “moving images of the past” (so does the computer screen).<sup>10</sup> Manovich’s discussion of the history of the screen is too schematic, and easily invites counter-arguments. Defining the classical screen as “a flat, rectangular surface” by-passes the fact that many paintings have been displayed in round or oval frames.<sup>11</sup> What about oval miniature portraits? What about multiple ways of framing and displaying photographs? Claiming that the “proportions [of different types of screens] have not changed in five centuries; they are similar for a typical fifteenth-century painting, a film screen, and a computer screen” is also problematic.<sup>12</sup> Such broad generalizations are hard to accept in the light of historical evidence. Screens have been constantly redefined as part of different cultural apparatuses. And what constitutes ‘typical’ anyway? Is the ‘typical’ film screen that of the 1930s sound film era, or the wide screen of today’s cinemas? The meanings of ‘typical’ are context specific, not universal. The genealogy of the screen is much more complex than Manovich makes us believe.

According to the *Oxford English Dictionary*, the foremost authority on the history of the English vocabulary, the word ‘screen’ first appears in texts from the 14th and the 15th centuries, although its etymology remains ‘difficult’.<sup>13</sup> In the 16th century, and probably earlier, it was used to refer to a “contrivance for warding off the heat of fire or a draught of air”. This usually meant a ‘fire screen’, a floor-standing piece of furniture, consisting of a sheet of lighter, often translucent material (paper, some kind of fabric, etc.) stretched on a wooden frame (or a series of connected, folding frames). There were also smaller handheld versions for ladies; a text from 1548 speaks about “Two litle Skrenes of silke to hold against the fier”.<sup>14</sup> In addition to their main purpose, decorated hand-screens were – like fans – also objects of fashion, aesthetic pleasure, and erotic play.

9 Manovich, Lev: *Language of New Media*, Cambridge, Mass. 2001, p. 103.

10 Ibid, p. 96.

11 Ibid, p. 95.

12 Ibid.

13 Much the same goes for the French ‘écran’, which most dictionaries, including the *Oxford English Dictionary*, see as ‘closely corresponding with’ the history and the meanings of ‘screen’. All references to the *Oxford English Dictionary* (OED) are to the second edition, edited by John Andrew Simpson and E.S.C. Weiner, Oxford <sup>2</sup>1989.

14 Ibid, Vol. XIV, “screen”.

Veiling one's face behind a hand-screen incited desire and curiosity, like a mask; hiding and revealing were undistinguishable aspects of this 'screen-play'. Gradually screens gained new connotations. In addition to natural elements, they were meant to protect the user from "other inconvenience or danger, or to shelter from observation, conceal, shut off the view, or secure privacy", as the *Century Dictionary and Cyclopedia* (1911, orig. 1889) summarized.<sup>15</sup> Whether from heat, cold or a gaze, the screen was a surface that protected by creating a barrier against something uncomfortable or intruding.

In the 19th century, and probably even earlier, the word 'screen' gained meanings that anticipated its uses as a means of displaying and transmitting information. The earliest such reference recorded in the *Oxford English Dictionary* dates from 1810: "To make Transparent Screens for the Exhibition of the Phantasmagoria"<sup>16</sup>. This represents a shift from the domestic sphere of furniture and personal accessories to the world of public entertainment. In the Phantasmagoria show that originated in the 1790s and remained popular for decades, the audience was presented images, many of them depicting monsters, ghosts and apparitions, projected on a semi-transparent screen. The figures seemed to grow or diminish dynamically. The trick was realized by using wheel-mounted magic lanterns ('fantascopes') that were pushed forward or pulled backward along rails behind the screen. The apparitions dashed upon the audience that was kept in the dark and either ignored the presence of the screen or pretended not being aware of it.<sup>17</sup> The invisibility of the screen, which was often achieved by making it wet, was meant to dissolve the boundary between the reality of the auditorium space and the world of fantasy and occult penetrating into it. The screen served as a veil, hiding the secret tricks and the machinery used to conjure them up. The faint beam of the 'fantascope', like the flames flickering behind a fire screen, became occasionally accidentally visible, hinting at a possible rational explanation. Yet instead of protecting the spectators from the uncanny secrets behind it, the screen was turned into a gateway for an uncanny attack on them. Phantasmagoria thus utilized the dual operation of hiding and revealing, of seducing and rewarding.

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15 *The Century Dictionary and Cyclopedia* (CDC) [1889], New York, revised and enlarged edition 1911, Vol. VIII, "screen".

16 *Oxford English Dictionary* (op. cit. 13), Vol. XIV, "screen".

17 In the beginning of Etienne-Gaspard Robertson's original Phantasmagoria (in French: Fantasmagorie) show in Paris, the oil lamps illuminating the auditorium were put out, plunging the audience into total darkness. Only then was the screen revealed from behind curtain. The easiest way to make the screen invisible was to make it wet. To enhance the illusion, the backgrounds of the lantern slides around the figures were painted black. About the basic techniques of phantasmagoria, see *Lanterne Magique et Fantasmagorie. Inventaire des Collections*, Musée National des Techniques, Paris 1990. About the contemporary reception of Robertson Fantasmagorie in Paris, see Matlock, Jann: "Voir aux limites du corps: fantasmagories et femmes invisibles dans les spectacles de Robertson", in: Le Men, Ségolène (Ed.): *Lanternes Magiques. Tableaux Transparents*, Reunion des Musées Nationaux, Paris 1995, pp. 82-99.

This anticipated the “logic of attraction”, so central to the world of 19th century entertainments.<sup>18</sup>

## 2 WHAT CONSTITUTES THE HISTORY OF ‘SCREEN PRACTICE’?

Although the word ‘screen’ may not have been used about public projections before 1810 (although we still don’t know for sure), the phenomenon labeled by Charles Musser as “the history of screen practice” certainly existed earlier.<sup>19</sup> Musser used the notion to place the emerging silent cinema into a continuum of preceding spectacles involving images projected on a screen. More specifically, he referred to the “magic lantern tradition in which showmen displayed images on a screen accompanying them with voice, music, and sound effects.”<sup>20</sup> Magic lantern shows had been staged since the second half of the 17th century.<sup>21</sup> Unlike Phantasmagoria, part of this tradition, most early shows made no effort to hide the lantern, the lanternist or the screen. This becomes clear from the rich iconography of lantern projections, collected by David Robinson.<sup>22</sup> Early lantern shows, often given by itinerant lanternists in private homes, had an intimate quality. The audience frequently gathered around the lanternist. The shows were essentially storytelling events illustrated by images and accompanied by a hurdy-gurdy or some other musical instrument.

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18 The word attraction was introduced in the context of early cinema by Tom Gunning and André Gaudreault in a series of influential articles, including Gunning’s “The Cinema of Attractions: Early Film, Its Spectator, and the Avant-Garde”, in: Elsaesser, Thomas/Barker, Adam (Eds.): *Early Cinema: Space, Frame and Narrative*, London 1990. According to my point of view the cinema inherited on various level its logic of attractions from earlier popular spectacles. For me the idea of ‘attraction’ does not only relate to the aesthetic and narrative structuring of the show itself, but to the whole context surrounding it, including promotion, the role of the ‘barker’, the building or the tent, etc. For a huge array of 18th and 19th century popular attractions, see Altick, Richard D.: *The Shows of London*, Cambridge, Mass. 1978.

19 The word ‘screen practice’ was coined by Musser. See Musser, Charles: *The Emergence of the Cinema: The American screen to 1907* (History of the American cinema, Vol. I), Berkeley/Los Angeles 1994, Chapter one, “Towards a History of Screen Practice”.

20 Ibid., p. 15.

21 A rich resource on the history of the magic lantern is the *Encyclopedia of the Magic Lantern*, edited by David Robinson et al., London 2001.

22 Numerous prints and paintings about magic lantern shows help us define the role of the screen (see Robinson, David: *The Lantern Image. Iconography of the magic Lantern 1420-1880*. Supplement No. 1, Ripon 1997. There is a wonderful watercolor painting (circa 1760) by Paul Sandby in the British Museum depicting a lantern show in an upper class salon. The audience consists of only a few people, and the showman is clearly an itinerant lanternist (a boy produced musical accompaniment. A large sheet-like piece of cloth has been hung upon the wall. It is needed because the wallpaper is dark and the wall covered with paintings. The projected image seems too large and detailed to have been possible to realize at this early stage.

The hand-painted images were projected either on a blank wall or on a piece of white cloth serving as a screen. The size of the projected images seems to have been fairly small, although the lanternists tried to maximize it. They had to find the optimal distance: placing the lantern too far from the screen would have enlarged the projection but resulted in a faint image. Judged from the existing visual evidence, the lantern often stood fairly close to the screen – brightness was more important than large size. This was necessitated by technical limitations, particularly the weakness of the available light sources (until late 18th century only candles or simple mineral oil lamps were used). This situation also partly explains the position of the spectators. They had to remain close to be able to perceive the images well and to hear the lanternist's interpretations.<sup>23</sup> This arrangement also emphasized the role of the lantern itself. The visible presence of the 'box' from which the pictures emanated – whether interpreted as a magic object or a rational contrivance – must have been an essential part of the attraction.

Since the early 19th century, the emergence of the 'big screen' can be traced fairly accurately. Well before the middle of the century formulations like [the] "[m]agic lantern is a species of lucernal microscope, its object being to obtain an enlarged representation of figures, on a screen in a darkened room" had become quite common.<sup>24</sup> Particularly during the second half of the century, the magic lantern show became increasingly sophisticated, attracting much larger audiences than before. Reflecting its growing (but, in the end, short-lived) social and cultural prominence as a public educational entertainment, the size of the projection screen and that of the projected image grew larger.<sup>25</sup> Magic lanterns were even used in urban outdoor spaces to project advertisements or election results for large crowds. This was made possible by technical improvements, better optics and new powerful illuminants (oxy-hydrogen limelight, electric carbon-arc).<sup>26</sup> Parallel to this development, simple magic lanterns became widely

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- 23 To maximize the brightness of the images may also be one explanation for the choice of back projection in Phantasmagoria. The lanterns could be brought very close to the screen. For larger images, however, they had to be pulled back, which made the image fainter. This discrepancy in the image quality was commented on by contemporaries as well. In 1833, the scientist David Brewster defined the Phantasmagoria in the following manner: "The power of the magic lantern has been greatly extended by placing it on one side of the transparent screen of taffetas, which receives the images while the spectators are placed on the other side, and by making every part of the glass sliders opaque, excepting the part which forms the figures." (Brewster, David: *Letters on Natural Magic*, London 1833, p. 80.)
- 24 *Oxford English Dictionary* (op. cit. 13), Vol. XIV, "screen". Entry from 1846.
- 25 Of course, in a way the tradition of lantern slide projections exists to this day in educational and domestic contexts. Its prominence as a public spectacle, however, has been taken by other cultural forms.
- 26 The social force motivating this development was the increasing demand for entertainment and visual instruction among the new mass audiences, particularly in cities. From the late 19th century magic lanterns were even used outside in the evening time to project advertisements and news such as election results on public buildings, re-



available for the middle and upper class consumers, providing one of the early signs of the beginning invasion of media technology to the home. The commodification of the magic lantern stripped it off some of its mystery, yet its cultural and social impact in the home remained limited. It was essentially a toy for projecting fairy tales and comic episodes. Fancy external design became more important than the quality of projection. The projected image remained small and faint, establishing an unintentional link to the projections of the old days.

During the second half of the century the success of the professional magic lantern show established a model for screen practice that early film culture could utilize on its way to becoming a cinema-centered industrial entertainment. With this process, the word 'screen' became firmly associated with film projection, reflecting the victory of projected moving images against other alternatives, such as the idea of viewing films in peepshow machines, Kinetoscopes and Mutoscopes. By 1910 the word had come to be used metonymically, meaning the film culture itself, and often written with capital letters: The Screen. That year the *Moving Picture World* wrote that "people like to see on the screen what they read about", referring to their filmic preferences. When a certain Mrs. P. Campbell stated in 1920 that she felt "much too aged for Eliza on the Screen", she referred to acting in the movies, working for the film industry.<sup>27</sup> Later, words like 'Big' or 'Silver' came to be added in front of 'Screen', perhaps expressing the triumphant self-confidence of the industry, perhaps functioning as a 'screen' against more recent audiovisual intruders. The expression 'Big Screen' may date from the 1950s, when the television emerged as a serious competitor to the cinema and the film industry introduced new large screen formats (Cinerama, Todd-AO, Cinemascope) as a defensive move, but it may also be later, associated with the proliferation of 'small screens'.

In spite of its usefulness, Musser's way of using the concept screen practice limits its scope. Looking back from the vantage point of early cinema leads Musser to omit traditions and forms that cannot be directly linked with the lineage of projecting films as a public spectacle, but that had nevertheless an established position in the world of public spectacle.<sup>28</sup> The moving panorama, for example, enjoyed widespread popularity, often competing for audiences with the magic lantern show.<sup>29</sup> It was not a projection-based form, at least not primarily, although rear-projected images could be used as 'special effects' in the tradition of the

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defined as gigantic projection screens. Such projections were often pictured on the front pages of popular newspapers like Frank Leslie's Illustrated Newspaper (see f.ex. Nov. 23, 1872 and Oct. 25, 1884).

27 *Oxford English Dictionary* (op. cit. 13), Vol. XIV, "screen".

28 This reminds one of the positivistic and teleological reading of the 'pre-history' of the cinema in Ceram, C.W. (Marek, Kurt W.): *Archeology of the Cinema*, London 1965.

29 See Huhtamo, Erkki: "Global Glimpses for Local Realities: The Moving Panorama, a Forgotten Mass Medium of the 19th Century", in: *Art Inquiry* (Poland), Vol. IV (XIII), 2002. Special Issue on "Globalization in Art", edited by Ryszard W. Kluszczyński.

**Phantasmagoria.** The moving panorama was a large and very long painting that was wound in front of the audience from one vertical roller to another. It was usually 'framed', either by the proscenium or by pieces of canvas masking the front part of the hall. A lecturer stood next to the moving painting explaining it to the audience that sat opposite the painting in the auditorium. Music and sound effects were also used. In spite of evident technical and aesthetic differences, the viewing situation (including the presence of the lecturer) had many similarities with the magic lantern show and early cinema. As travelling media experiences all these were often presented in the same venues from local opera houses to churches. From a cultural point of view the moving panorama was clearly a form of 'screen practice'.



*Fig. 1: Moving panorama fan, containing a long panorama roll depicting the four seasons. French, 1820s. Erkki Huhtamo Collection, Los Angeles.*

Musser also excludes the shadow theatre, the most ancient and geographically the most widely known of all screen practices. Forms of the shadow theatre evolved in Asia, from India to Indonesia and China, hundreds, and even thousands, of years ago. These traditions had matured long before they were introduced into

Europe in the late 17th century.<sup>30</sup> Although technically a live performance, the shadow theatre qualifies as a screen practice: the audience sits in front of the screen, while the performers operate the shadow puppets behind it, between the screen and the light source.<sup>31</sup> The spectators are often allowed to see the moving shadows on the screen, while the 'machinery' animating them is hidden, although this is not always the case.<sup>32</sup> The shadow theatre recalls the arrangement of the Phantasmagoria. Indeed, as David Brewster reminded us, in his original Phantasmagoria, Etienne-Gaspard Robertson mixed features of the magic lantern and the shadow show by introducing "along with his pictures the direct shadows of living objects, which imitated coarsely the appearance of those objects in a dark night or in moonlight"<sup>33</sup>. Similarly, the Japanese Utsushi-e tradition, which began around 1800 (coinciding with the heyday of Phantasmagoria in the West) was an intricate mixture of elements from shadow theatre, the magic lantern show and popular story-telling.<sup>34</sup>

For an archaeology of the screen the shadow theatre is interesting not only as a geographically very widespread public spectacle, but also as a phenomenon that easily crossed the boundary between the public and the private, particularly in the West. Miniature shadow theatres were marketed for domestic use in Europe from the late 18th century on, but shadow shows could easily be enacted without any dedicated equipment, by projecting hand shadows on the wall, and perhaps by turning a translucent fire screen into a site for visual storytelling<sup>35</sup> The

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30 See Cook, Olive: *Movement in Two Dimensions*, London 1963. A major influence for the European shadow theatre was the Turkish Karagöz, although the influence of Chinese and Indonesian traditions was also felt thanks to lively trade relations. See also Damianákos, Státhis/Hemmet, Christine (Eds.): *Theatres d'Ombres. Tradition et Modernité*, Institut International de la Marionette, Paris 1986.

31 An interesting exception was late 19th century 'Ombromanie', the art of hand shadows. Here the shadow artist stood in front of the screen and revealed his 'machinery' (his own hands) to the audience. Demonstrating the skill and mastery of the performer was as important as the end result.

32 However, in some traditions, like the the Wayang beber on Bali, part of the audience sits on the sides, giving some spectators an opportunity to observe both the performers and the performance on the screen. Theoretically the existence of this 'double-point-of-view', which can be encountered elsewhere as well, is highly interesting. In Western traditions it was usually denied.

33 Brewster (op.cit. 23), p. 82.

34 The Japanese Utsushi-e show, which emerged in the early 19th century, is an original form of popular media theatre, in which hand-held, highly mobile magic lanterns are manually operated behind the screens by several operators. The slides were also often provided with complex moving parts. The lantern images have taken the place of shadow puppets. Utsushi-e also incorporated elements from popular story-telling and musical performance. The tradition has recently been revived by groups like the Minwaza in Tokyo.

35 In Japan sliding paper screens (shoji, actually movable walls) were a central aspect of the traditional house. The art of depicting shadows seen behind such transparent paper screens in ukiyo-e prints and other forms of visual representation became a highly

tradition of hand shadows as a popular pastime has been documented in numerous 19th century manuals for home entertainments and several widely distributed prints. Reversing the customary trajectory from public to private, Ombromanie, the art of hand shadows, became a popular stage entertainment in the late 19th century.<sup>36</sup> In one of those cases that literally begs to be assigned symbolic significance, Félicien Trewéy, the best known Ombroman, became the British manager of the Lumière brothers, the French film pioneers, promoting their invention, Le Cinématographe.<sup>37</sup> Many magic lantern showmen made a transition equally smoothly, incorporating cinematographic films into their repertoires of lantern slides. Early 'film shows' were often hybrids of these two forms, held together by the logic of screen practice.

### 3 THE ORIGINS OF THE 'SMALL SCREEN'

The origin of the 'small screen', particularly if we refuse to consider the television screen as its 'natural' starting point, is an intricate media archaeological issue. Is it possible to establish a link between domestic fire screens and the later media screens? At first their functions seem quite different, yet we might note that from early times fire screens were often embellished with ornaments and even with pictures. Particularly during the Victorian era large folding screens were used in the homes of the bourgeoisie to divide spaces (and often to serve as fire screens as well). No doubt influenced by the gorgeous pictorial screens imported from Far Asia, these were often covered with printed scraps, colored lithographs and other types of mass-produced images.<sup>38</sup> They became veritable collages, bringing into mind the countless 'scrap books' created by women and children in their

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refined system of signification. The Japanese also had special 'rotating lanterns' – thanks to the heat emitted by the light source, a cylinder with painted figures rotated inside a paper lantern creating a continuous transforming shadow image. Discussion of screens in Japanese culture falls outside the framework of this essay.

- 36 Interestingly, here the shadow artist stood in front of the screen and revealed his 'machinery' (his own hands) to the audience. Demonstrating the skill and mastery of the performer was as important as the end result.
- 37 Maxim Gorki's well known account of his first experience of the Cinématographe ("Today, I was in the kingdom of shadows"), could perhaps be read against the popularity of the shadow theatre. Gorki's text has been reproduced in: Harding, Colin/Popple, Simon: *In the Kingdom of Shadows. A Companion to Early Cinema*, London 1996.
- 38 In the 19th century the word screen was also used to refer to upright frames in which photographs were displayed, both in private houses and public exhibitions. In 1888 a person wrote about "some of the most delightful panel screens for photographs I ever set eyes on". See *Oxford English Dictionary* (op. cit. 13), Vol. XIV, "screen". In Japan, separate sheets of images constituting visual narratives were often attached to folding screens already in the Edo era (before 1868). This turned them into veritable information surfaces that would deserve a separate study.

spare time.<sup>39</sup> Although the images pasted on the screens served a decorative function, they also became celebrations of the enormous changes taking place within the 'regime of the visible'. The fields of unrelated and overlapping images that covered these screens were an expression of a new visual culture in the making. They were naive reflections of the frenzy of images made possible by photographic reproduction and new printing techniques. The habit of decorating screens with mass-produced images was so common that cultural critics became concerned about their negative impact on 'good taste' (a concern later voiced about the impact of television). Mediocre artworks were sometimes contemptuously compared by critics with such screens.



Fig. 2: Victorian scrap screen. Source unknown.

39 It would be tempting to relate this to the contemporary habit of covering the door of the refrigerator with postcards, photos, notes and little magnets. Little research has been done of the iconography of such 'imaged' refrigerators. It would be interesting to know if the combinations are arbitrary or part of some kind of an iconographic program.

Victorian decorated screens can be considered 'information surfaces' only indirectly, via retrospective cultural theorizing. The information they may have transmitted had been filtered and modified through the ideology of domestic pastime activities. As part of the *horror vacui* of the Victorian home the screens merged with other elements of the interior rather than stood out from it. The images pasted on them were opaque, which associated them with other textured surfaces, like the fabrics covering the furniture or wallpaper – including pictorial 'panoramic' wallpaper. Yet, it should be noted that screens were also used for displaying translucent images since the late 18th century, in settings that anticipated the role of media screens. 'Moonlight transparencies' and 'diaphanoramas' were translucent paintings mounted in vertical wooden frames standing on the floor or placed on the table.<sup>40</sup> When illuminated from behind, the views began to glow in brilliant colours. Another form of translucent image that became popular in the 19th century was the lithophane. Lithophanes were porcelain plates with scenes 'imprinted' on them. When lighted from behind, the almost invisible scenes became visible in remarkable three-dimensional detail. Although lithophane plates were used for decorative purposes as window embellishments (occupying the position traditionally reserved for stained glass), lamp shades and side panels for tea warmers, they were also mounted in ornate wooden or metallic viewing frames, with a candle at the back. Great numbers of lithophanes, often depicting romantic genre scenes, were available either as separate plates or as series making up visual narratives.<sup>41</sup>

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40 German painters Georg Melchior Kraus and Franz Niklaus König were well-known creators of such transparencies. See *Sehsucht. Das Panorama als Massenunterhaltung des 19. Jahrhunderts*, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Bonn 1993, pp. 198–199. See also Verwiebe, Birgit: *Lichtspiele. Vom Mondscheintransparent zum Diorama*, Stuttgart 1997. Transparencies were also displayed publicly in large size as part of different festivities. The connection with theatrical scene painting is obvious, but the issue cannot be elaborated on here. The massive wooden display case the König used to show his transparencies for visitors or prospective buyers looks much like a large floor-standing television set of the future. See: Blühm, Andreas/Lippincott, Louise: *Light! The Industrial Age 1750–1900. Art & Science, Technology & Society*, New York 2001, p. 97.

41 There were also tiny erotic lithophanes that were kept in small pocket cases, and held out against the light only intermittently in appropriate circumstances.



*Fig. 3: Cast iron lithophane viewer seen from the backside (showing the candle stand), with a pile of interchangeable lithophane plates. Probably French, ca. 1850-60. Erkki Huhtamo Collection, Los Angeles.*

Beside their evident decorative function, the lithophane viewers anticipated certain features of the 'virtual windows' of the future. Compared with the moonlight transparencies, they introduced a new principle: the separation between 'hardware' and 'software'. Instead of displaying just one permanent view, the images could often be changed. Before viewing, the viewer had to be 'switched on' by lighting a candle behind it. Displayed in a frame the lithophane opened a new channel for visual experience, becoming a permanent feature of the bourgeois domestic interior. The flame flickering behind the panel not only made the image visible and distinct, it also made it 'live'. Tempting as such arguments are, both moonlight transparencies and lithophanes have limited relevance as precedents to the later screen media. After all, they were primarily a form of decoration and interior design. The panoramic or 'scenic' wallpaper transformed the saloon in a more radical manner. The interior could be turned into a simulated exterior complete with trees, houses and painted birds frozen in mid-air. Even more interestingly, the wide range of topics extended from representations of localities to narrative events, including anything from Captain Cook's

Voyages to Napoleon's victories and even to the street fights in Paris during the 1830 revolution.<sup>42</sup> Even guidebooks to interpret the views depicted on the wallpaper were issued. As a manifestation of the 19th century 'panoromania', the panoramic wallpaper made the issue of the screen temporarily retreat to the background – the inhabitants were as if permanently living in a virtual environment; the sense of frame disappeared. After the novelty value dissipated, the 'virtual reality' of the panoramic interior probably got weaker and became interpreted as another form of interior decoration. Although not totally unfounded, characterizing a living room decorated with illusionistic panoramic wallpaper as the '19th century holodeck' would be an exaggeration.

#### 4 PEEPING, THE BODY, AND THE SOCIAL

The 'proto-screens' analyzed so far provided new surfaces for displaying images in the home. These images were different from the customary paintings and prints hanging on the walls. They represented a beginning shift from images as decoration to images as the center of attention. Since the mid 18th century we witness the appearance of domestic 'media machines', devices meant for consumption of views produced for this purpose by professional printmakers. Within the domestic sphere, such devices first made their appearance among the privileged classes, giving an expression to their tastes and desires. Yet already before entering the salon such devices had been used as public entertainments appealing to a very different audience. From the 18th century on, the dynamic relationship between the public and the private use of such apparatuses begins to characterize their cultural meaning.

These devices did not have a 'screen' in the sense of the television screen. The most common principle of 'interfacing' users with these viewing machines was by peeping. The views were hidden inside a box, and to access them one had to glue one's eye(s) to a hole provided with a magnifying lens.<sup>43</sup> Illumination was provided by candles and often by opening and closing 'doors' at the sides of the box, which caused atmospheric transformations /day turning into night, etc.). The display of curiosities in such a manner in itinerant peep shows (also known as 'raree shows') was obviously based on economic calculation.<sup>44</sup> Almost anything

42 The definite work on the panoramic wallpaper is Nouvel-Kammerer, Odile: *French Scenic Wallpaper 1795-1895*, Musée des Arts décoratifs, Paris 2000.

43 For a general history, see Balzer, Richard: *Peepshows. A Visual History*, New York 1998. The origins of peepshow boxes seem to go back to the Renaissance experiments with perspective. In the 17th century savants like Traber and Kircher described different models in their works. In Hollard, 'perspective boxes', containing illusionistic painted surfaces and mirrors were produced by van Hoogstraaten and others. These may have provided one model for the boxes used by itinerant showmen.

44 There is a huge literature on the history of curiosities and curiosity cabinets. For a recent overview, see Stafford, Barbara Maria/Terpak, Frances: *Devices of Wonder. From the World in a Box to Images on the Screen*, Los Angeles 2001.



could be made attractive by hiding it from the gaze and making promises, hints and suggestions. A coin provided the way to satisfy these artificially created expectations. In addition to appealing to people's 'natural' curiosity, the peep show exploited the growing tension between the relative visual poverty of most people's environments and the 'opening of the world' as a result of the voyages of discovery, new inventions, emerging capitalism and the ideas of the Enlightenment. The showmen attracted viewers by visual impressions of sensational topics such as the wonders of China, famous palaces, battlegrounds, or the devastation caused by the Lisbon earthquake. By both creating and exploiting desires, and satisfying them for money, the peep show submitted itself to the logic of attraction. It was a 'penny business' – its financial prospects were steady but limited.

The sheer variety of peep devices – from the large peepshow boxes for *Public Viewing* to tiny paper toys, alabaster 'peep eggs' and 'stanhopes' – as well as their considerable influence on the cultural imagination of the 18th and the 19th centuries warrants many questions. Why did peeping into a hole, rather than observing a larger 'window', come to dominate? Why was the individual viewing act given preference over the collective experience? What was the phenomenological significance of peeping?<sup>45</sup> Did it express a desire to broaden or, rather, to limit one's field of vision? To extrapolate from late 20th century theories of virtual reality, how was the viewer's body involved? Was the act of peeping an effort to escape from the body's physical confines by fleeing to some immaterial mode of existence? Or was it something else? Answers to these questions are necessarily speculative. There are few texts that would provide as clue about the contemporaries' perspective. Although there are many prints showing people peering into peepshow devices, they rarely reveal what could be seen behind the lenses. It could be claimed that the persistence of the act of peeping was a symptom of an emerging sense of individuality, an effort to find at least a temporary outlet from the oppressive confines of the collective social existence. Yet such an interpretation might not bear the weight of evidence. In illustrations from the 18th and early 19th centuries individuals are rarely shown alone with the peep box – they are surrounded by others. To peer into the viewing holes on a market square people had to take turns. Yet the peepers are always surrounded by a crowd, obviously making noise and probably commenting on the seen.<sup>46</sup> The showman adds his own stories and suggestions. Any sense of 'deep immersion' would have been disturbed by the viewing context. Also, because the act of viewing was based on a financial contract, each view could be observed only for a short moment.

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45 I will exclude psychoanalytical analyses of peeping from my article, and concentrate on its cultural and social implications.

46 In this sense the difference between a magic lantern show and the experience of the peep show may have had some similarities, although both the viewing contexts and the apparatuses were of course quite different.

The social role of the peep show as a street entertainment, as well as the structure of the viewing box itself, made physical contact unavoidable, emphasizing rather than effacing the body. At fairs and public festivities, the peepshow provided an occasion for a temporary transgression from the usual normative behavior, bringing the bodies of the opposite sexes close to each other. The distance between the peeping holes at the front of the large boxes was short. They were sometimes placed in two rows one above the other – the upper ones for grown-ups and the lower ones for children. Contemporary prints show the peepers literally squeezed against each other.<sup>47</sup> The genders and ages of the viewers were mixed. Judging from the existing iconographical evidence, the number of women and children among the peepers seems prominent.<sup>48</sup> This might imply that the peep show was considered a feminine and perhaps even an ‘infantile’ form, appropriate for women and children as a momentary outlet from the world dominated by men. Until the late 19th century, there are few traces referring to any erotic content inside the boxes, an issue we almost automatically connect with the word ‘peepshow’. What about men? Like women and children, they are shown peering into the holes. Yet they are also often seen trying to assert their power by standing behind the female peepers as escorts, or going even further: in an often repeated motive (or topos) a man attempts to kiss a beautiful girl, who has been left momentarily unguarded behind the back of her mother, bent over the peephole.<sup>49</sup> When men themselves are shown peeping, they are often depicted in a satirical manner as victims, for example falling prey for pickpockets (sometimes presented as symbolic personifications of politicians or tax officials). Instead of enhancing it, peeping into the box seems to question the man’s mastery over the surrounding material world. This motive migrated to the imaginaries around the stereoscope and the Mutoscope, later forms of the peepshow. In a revealing French cartoon from 1910, the scene showing a pick-pocket emptying a male peeper’s pockets is clearly invested with latent homo-

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47 I have verified this experimentally with some colleagues, using one of the large 18th century four-hole peepshow boxes at the Film Museum in Torino, Italy as the test case. Public peepshows may have played a role in spreading contagious diseases, or at least fears of it. I have not yet found any early sources raising this issue, but it became well known in early 20th century with the emergence of kinetoscope parlors and nickelodeons. See Nasaw, David: *Going Out. The Rise and Fall of Public Amusements*, Cambridge, Mass. 1993, pp. 180-182.

48 This can of course be a partial illusion caused by the nature of the evidence. Women and children may have been more picturesque subjects for paintings and prints than men. The dominance of women and children may also have something to do with iconographic traditions: models for new works were provided by earlier works, rather than actual live models and scenes.

49 This motive (or ‘topos’) travels from the late 18th century peepshow to the visual discourses about the stereograph in the second half of the 19th century. The man stealing the kiss is now often depicted as a door-to-door salesman for stereoscopic photograph, acting behind the back of the husband looking into the stereoscope.

sexual overtones.<sup>50</sup> The peeper experiences the pickpocket's touches as erotic, and the position of the male bodies suggests an anal intercourse.



Fig. 4: *Funnygraph*, Series No 118. Postcard published by Misch & Stock's, designed in England, and printed in Prussia. Postally used, February 5, 1904. Shows a humoristic episode around an early oak Mutoscope. Erkki Huhtamo Collection, Los Angeles.

50 Reproduced in Bottomore, Stephen: *I Want to See this Annie Mattygraph. A Cartoon History of the Coming of the Movies*, Le Giornate del Cinema Muto, Pordenone 1995, p. 42. The peeper says: "When I see a naked woman, I can almost feel her caresses." On the same page there is a much tamer British variation of the same motive from the same year (two months later). The caption says: "Jones (looking into animated - picture machine): Oh, I say, that's funny - ha, ha! A chap having his pocket picket - ha, ha!". Bottomore's book also contains several other examples of cartoons about problems staring into a peep show machine causes for men.

## 5 PEEPSHOWS AND PRIVACY

Regrettably, beside some prints, we have little direct evidence about the use of peep show boxes in private settings. They were most likely often used primarily as playtoys and pastime novelties and only secondarily as sources of information and enlightenment. For the domestic user, the act of peering into the lens of a handsomely decorated pyramid-shaped viewing box may have served as a playful enactment of public spectacles.<sup>51</sup> The domestic devices were smaller and their mechanisms simpler than those exploited in public spaces. Still, they often allowed the user to simulate the effects performed by professional showmen. The views could be changed in succession and the day could be made to turn into night by manipulating the direction of the light falling on the view. Because of social stratification and segmentation, it is thinkable that the upper class users, particularly women and children, had never had direct experience about the 'vulgar' peepshows on the streets and market places. They knew these shows indirectly through representations – narratives, prints, tapestries and porcelain figurines about the life of the 'common people'. The use of the peepshow box in the saloon would then be interpreted as a distanced and nostalgic ritualistic re-enactment of the rituals of folk culture. Interestingly, the views used in the street shows and in the saloons often came from the same printers who often sold thousands of copies; the 'software' was the same, only the contexts were different.

While the audience on the streets was dependent on the choices made by the professional showman, the upper class home user could playfully alternate between the roles of the showman and that of the audience.<sup>52</sup> The domestic peep boxes may have been visual curiosities and toys rather than serious 'media machines'; yet their influence should not be underestimated. The possibility to manipulate the device manually by the viewer is important. Its smaller size contributed to its re-definition as a personal 'media machine' – it was subordinated to the intentions and the will of the user rather than vice versa.<sup>53</sup> At

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51 The popular Polyorama panoptique, invented by the optician Lefort in Paris in 1849, has often been thought of as having been inspired by the Diorama, a large scale visual spectacle launched by Daguerre and Bouton in 1822. The 'Dioramic effects' were in essence magnified and elaborated versions of those transformations effected with the professional peep show boxes already in the 18th century. The Polyorama panoptique was probably influenced by both these traditions. See Mannoni, Laurent: *Le Grand Art de la Lumière et de l'Ombre*, Paris 1994, p. 180.

52 Like other kind of optical toys, small peepshows were also created at home as a good and educational pastime. In the author's collection there is a fabulous home-made 'accordeon peep-show', innovatively decorated by Victorian scraps. Such peep shows contain no box; instead they fold together like the bellows of an accordion; thus the name.

53 The fascination with 'hands-on' access to domestic media machines runs from this kind of devices via 19th century 'philosophical toys' to today's videogame consoles. Although

the same time it invited social interaction among users who more or less shared the same value system. Particularly in the 19th century, instructions for building optical devices and drawing images for them were published in periodicals and manuals for educational parlor entertainments. All this prepared the ground for later media machines used at home, including, much later, the personal computer. Long after the itinerant peepshows had disappeared from the streets and market places, the tradition lived on in children's rooms in the form of 'Polyorama Panoptiques', stereoscopes and eventually the View-Master. The peepshow also became a motive often evoked in literary traditions, including children's books, with nostalgic undertones. In this sense its discursive career was paralleled with that of the magic lantern.



Fig. 5: *L'Optique*, engraving by J. Henrriquez after F. Eisen the Elder (À Paris chez Buldet, rue de Gèvres).<sup>54</sup>

according to this logic 'eBooks', electronic devices simulation a paper book, should have been a success. In spite of many attempts, they have so far failed rather miserably.

54 Reproduced in Mannoni, Laurent: *Trois Siècles de Cinéma: De la Lanterne Magique au Cinématographe*, Paris 1995, p. 54. The original French text is as follows: "Nicolle

While the eroticism of the public peeping seems to have been more latent than actual, at least until the late 19th century, it became more explicit in the discourses around domestic viewing. This was reflected in prints, as well as in the wide supply of 'secret' erotic objects for peeping. Among the interesting early traces highlighting this issue it is worth referring to a late 18th century print titled "L'Optique". It depicts two girls using a vertical peep show box provided with a lens and an angled mirror on top. Through the lens the peeper is supposed to view a print placed horizontally in the lower part of the device. In this case, a crucial change has taken place: instead of the usual 'vue d'optique', the girl gazing into the lens sees a different kind of 'landscape': a young man's bare bottom! The young man hiding behind the box has secretly removed the views and replaced them with his exposed private parts. While one of the young ladies stares at the sight in obvious astonishment, the other turns away. Through an obscene trick, the body has optically re-entered the visual field usually reserved (at least in theory) for out-of-body experiences, even in real-time. This corporeal shock treatment destroys any illusion of an 'immaterial' visual world within the feminine confines of the peepshow box. The exposed male body has returned the female peepers within the regime of the Masculine in a brutal manner. Interestingly, the caption to the print speculates on the correct mode of behavior: which of the girls behaves properly, the one who turns away or the one who keeps on staring?

## 6 OPTICAL FURNITURE, HANDHELD PROSTHESES

The idea of peering into a hole was evoked again and again along the cultural trajectory leading from the 18th century peepshows to 19th century devices like the Megalethoscope, the stereoscope and the zoetrope and further to early moving picture viewers such as the Mutoscope and the Kinora. The domestic devices accompanied the popularity of public entertainments from old style touring peepshows to new forms like the cosmorama, the Kaiser Panorama and eventually the Kinetoscope and the Mutoscope. The idea of domestic 'peep media' was given a strong impetus in the second half of the 19th century by the introduction of novelty devices for the home, such as the Megalethoscope and, above all, the stereoscope. It is quite possible that the owners of these devices never associated them with the peep shows of the past, which without a doubt was in the producers' interest. The Megalethoscope, patented by the Italian photographer Carlo Ponti in the 1860s, was a large and elaborate piece of 'optical furniture' for the parlors of the bourgeoisie, meant for viewing large framed photographic prints.<sup>55</sup> It was produced in various finishes from relatively plain to

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observe et son oeil curieux, / À ce qu'il voit près sans malice, / Mais Aglaé fuit d'un air furieux, / Juge Lecteur, quelle est la plus novice".

55 These prints, marketed internationally by Ponti, usually depicted geographic locations, particularly Italian views. Both in their subject matter and in their treatment (painted backsides, enhanced by pinholes), they derived directly from the tradition of the 'Vue

extremely ornate. A social scale was embodied in the amount of the ornamentation. Beside its function as a viewing device, it was clearly meant as a status symbol, anticipating the varieties of radio and television cabinet designs in the next century. Megaethoscope was the ultimate peepshow, but not for the poor; because of its size, it would not even have fitted into smaller living rooms.

Many stereoscopes were also handsome pieces of optical furniture, but there was a much greater variety of sizes and forms. After being introduced to the public at the Crystal Palace exhibition in London in 1851, the stereoscope soon became extremely popular both in simple handheld and elaborate freestanding cabinet versions. Compared with the peepshow box, the stereoscope introduced new features: it was used to view photographs, and these were three-dimensional. Peeping at the stereoview through the lenses not only enhanced its visibility – a real transformation, performed by the human mind with the help of the stereoscope, occurred. A pre-determined relationship between the image, the viewing apparatus and the viewer was an indispensable condition for the experience.<sup>56</sup> Like the majority of the 'vue d'optique' prints available for peep shows and zograscope, stereoviews of famous cities, landmarks and distant lands were favorite topics. During the second half of the 19th century the stereoscope developed into a veritable 'virtual voyaging' tool.<sup>57</sup> 'Package tours' of different countries were sold as sets, containing guidebooks and maps in addition to large numbers of carefully arranged stereocards. Everything was delivered in handsome boxes that looked like books.<sup>58</sup> Favorite topics, already familiar from the

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d'optique'. The Megaethoscope also came with a series of detachable frames that made it possible to use it as a 'graphoscope' to view both cabinet cards and carte de visites. The photographic prints were inserted into the device one by one and viewed by one person at a time, peering into a square opening in one end the apparatus. By opening and closing doors at the back and on top of the device, the translucent black and white albumen photographs, pin-pricked and hand-colored from the backside, would undergo a dramatic transformation from day to night and turn from black and white to color. Because of the length of the apparatus, another person was needed to open and close the doors. The design of the Megaethoscope thus reveals that it was meant for social, rather than solitary sessions.

- 56 It is possible to develop a skill for 'free-viewing' stereographs without the stereoscope. The author can do it easily. This experience is interesting, because it shows a three-dimensional view, but also the surrounding objects in the periphery of vision. This might recall Rousseau's discussion of the zograscope, except that free-viewing requires unflinching concentration on the stereograph.
- 57 That 'normal' photographs of buildings and places could serve this function as well as is confirmed by a quotation from the British author W.J. Loftie: "It is pleasant to lean back in one's chair and be transported to distant countries at a glance." Cit. Briggs, Asa: *Victorian Things*, London 1988, p. 247. Briggs also writes about the importance of the stereoscope (pp. 132-133).
- 58 Such sets were sold by large American companies like Underwood & Underwood and the Keystone View Company. These companies often used door-to-door salesmen operating on rural areas assigned for them. Precise instructions about the appropriate marketing methods were provided in the form of educational booklets. Examples of Keystone booklets exist in the author's collection.

repertory of the *vue d'optiques*, included wars, battles and catastrophes – events like the Johnstown flood or the San Francisco earthquake proved particularly popular. Stereoscopes reached a much larger and demographically varied audience than the peepshows ever did. The combination of photography and stereoscopy made the scenes seem very life-like, although the stereoscopic illusion of ‘really standing on the spot’ was really highly artificial. Yet, for contemporaries the stereoscope was a highly convincing tool for armchair travelling, an optical prosthesis to peek ‘beyond the horizon’. It brought the outside world to the privacy of the Victorian parlor. Decades in advance, it prepared the domestic users for the radio and the television.<sup>59</sup>

With the proliferation of cheap handheld Holmes-Bates stereoscopes and mass produced stereocards even the lower income households were eventually able to enter the realm of visual media. The stereoscope was the first media machine at farms or in working class homes. The device also proved valuable for the millions of immigrants entering the United States. Often with little knowledge of the English language, stereoviews provided them with both visual education and pastime. Symbolically it gave them a tangible piece of evidence about participating in the progress of media and technology.<sup>60</sup> In many ways the stereoscope as a domestic ‘media machine’ prepared the ground for the phonograph, radio and television. It was more than just a toy or a passing fancy. According to Jonathan Crary’s well-known argument, as a product of scientific research, the stereoscope was one of those demonstration devices that grounded seeing firmly in the body of the ‘observer’, anticipating the emergence of modernity.<sup>61</sup> Crary’s emphasis on corporeality and the cultural rupture embodied in the device may be theoretically valid, but it was hardly evident for contemporary ‘observers’ who embraced the illusions it provided. Although Wheatstone had demonstrated the indiscrepancy between the external reality and the impression created by the human perceptual apparatus, the stereoscopic tradition came to emphasize the opposite, the ‘unprecedented’ accuracy of the illusion. Yet the stereoscope also had its limitations. Although it might be claimed that by excluding the surrounding visual cues the stereoscope psychologically magnified the view (no points of comparison were present), the stereograph lacked a ‘panoramic’ quality. The

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59 Lynn Spigel confirms that “television’s inclusion in the home was subject to preexisting models of gender and generational hierarchies among family members – hierarchies that had been operative since the Victorian period.” Yet she does not mention the role of the stereoscope. See Spigel, Lynn: *Make Room for TV. Television and the Family Ideal in Postwar America*. Chicago/London 1992, p. 11.

60 Many cheap stereoviewers with cards depicting views of America were sent back to the homeland by Finnish emigrants to the United States in the early 20th century. Also those who returned often brought this device with them. It provided a surrogate experience to actually seeing America, and later functioned as a nostalgic time machine as well. Many such devices have been preserved in Finnish collections and family archives.

61 Crary, Jonathan: *Techniques of the Observer. On Vision and Modernity in the Nineteenth Century*, Cambridge, Mass. 1990.



view was three-dimensional, but it was also tightly framed – in fact, there was a square opening, a kind of screen, *inside* the scopic field. Like the peep show boxes before it, the stereoscope presented a ‘tunnel vision’: it emphasized the depth axis without managing to expand the visual space laterally – a challenge virtual reality head-mounted displays tried to tackle, with mixed results, a century later.<sup>62</sup>

Furthermore, the stereoscope presented a frozen moment, a still image. While this could be an advantage, giving the viewer ample time to reflect on the details, the lack of movement was increasingly felt as a deficiency. The emergence of film culture and the gradual decline of interest in stereoscopy took place simultaneously, which was hardly a coincidence. Finally, although it was used as a virtual voyaging tool, the stereoscope was an ‘off-line medium’. This could hardly be seen as a real lack in a culture where no permanent channels for visual on-line communication existed. However, when inventors and popular illustrators began to envision electric ‘tele-vision’ apparatuses in the late 19th century, the stereoscope was one of the models they turned to.<sup>63</sup> In imagination, the stereoscope was simply ‘wired’ and electrified to provide a kind of ‘tele-peepshow’ to communicate at a distance.<sup>64</sup> In the late 1910s a postcard published by the Keystone View Company declared: “She Sees Her Son in France. You can talk across the miles with your TELEPHONE – The WHOLE FAMILY Can See the WAR ZONE”. The picture shows an old lady sitting in an armchair, immersed in her stereoscope. The stereoscope emits (or attracts?) a lightbeam that pierces the distance, displaying a view from the front of the Great War. By associating it with the telephone, the card positions the stereoscope in a role that anticipates that of television.<sup>65</sup>

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62 As characterizing a peep show box as a miniature theatre reveals, the ‘stage opening’ of both the peep show box and the stereoscope seems to derive from theatrical traditions. This connection was made explicit by the rich French production of stereocards depicting scenes from the famous theatrical productions in the theatres in Paris – realized with miniatures! For an example, see Pellerin, Denis: *La Photographie Stéréoscopique sous le Second Empire*, Paris 1995, p. 84.

63 I use the spelling ‘tele-vision’ to refer to various early devices, many of them imaginary, that claimed to communicate at a distance by means of ‘electricity’ (electronics did not yet exist). ‘Television’ is a later established product and a successor to this tradition.

64 An illustration (probably French), visualizing this idea, said to be from 1890, has been reproduced, with no source mentioned, in Kloss, Albert: *Von der Electricität zur Elektrizität*, Basel 1987, p. 245. As the illustration shows, the tele-vision device is envisioned within the framework of the colonial experience, maintain a link (and power over the ‘dominions’) with the homeland.

65 The card has been used to inform the addressee that the representative of the Keystone View Company is going to deliver her order (of stereoviews) ‘about’ July 6, 1921. The card, as well as the extensive series of war views published by Keystone, has remained in use well after the war has ended. Although visually the situation resembles that of broadcasting, the card may imply the idea of two-way communication, often present in early vision about tele-vision.



Fig. 6: *She Sees Her Son in France*. Postcard, Keystone View Company, USA, 1915-21. Erkki Huhtamo Collection, Los Angeles.

In the 1930s, when experimental television broadcasts had already been launched in Europe and the United States using TV receivers with proper ‘screens’, ideas like handheld peep show televisions and wearable 3-D television spectacles were still presented.<sup>66</sup> These proposals may seem to have been prophetic anticipations of the head-mounted displays and ‘TV-goggles’ of the future, but they were really extrapolations of the preceding traditions, demonstrating the persistence of the peepshow imagination.

## 7 ANTICIPATIONS OF THE SMALL SCREEN

Magic lantern projections provided domestic audiences an occasional opportunity to enjoy images in a social setting. The peepshow model provided an alternative, which, in spite of the different constitution of its apparatus, also emphasized social rather than individual modes of consumption. When and how did the third alternative, the apparatus with a ‘small screen’ that allows a group of people watch together, emerge? A number of concrete anticipations can be mentioned. The miniaturized shadow theatres that proliferated in the homes of the bourgeoisie in the 19th century are one example. Without using any new technology, they nevertheless presented a backlit real-time spectacle that unfolded on a framed screen. The viewing boxes designed by Carmontelle (Louis Carrogis, 1717-1806) for the presentation of his “décors transparents animés” (typically

<sup>66</sup> See Gernsback, Hugo: “Radio in the Future”, in: *Radio-Craft*, March 1938, p. 591. A magazine article from 1938 about a “television monacle” has been reprinted in facsimile in Wood, Scott (Ed.): *Classic TVs. Pre-War thru 1950s*, Gas City, Ind. <sup>2</sup>1997, p. 3.

circa 50 cm high and up to 42 meters long) in the late 18th century are another example.<sup>67</sup> These devices were popular among the French aristocracy for a while, wiped aside by the French revolution. Carmontelle's transparent roll paintings were presented by cranking them from one vertical reel to another with a mechanism installed in a viewing box. The moving view was visible through a square 'stage opening'. To secure backlighting, the box was placed against a window, while the rest of the window was covered by a dark cloth. As Carmontelle's aquarelle about the installation demonstrates, the result looked surprisingly like the modern TV in a living room – truly a 'virtual window' into a realistic but imaginary world.<sup>68</sup> In the 19th century, a similar apparatus appeared again and again in the form of boxed miniature 'moving panoramas'.<sup>69</sup>

Another device that allowed a group of people to enjoy moving images together was the camera obscura.<sup>70</sup> The camera obscura is still mainly known as the predecessor of the photographic camera, yet its cultural roles, its discursive presence and the range of its applications were much wider. Smaller camera obscuras were used by artists as aids to sketch scenes in front of the camera.<sup>71</sup>

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67 Carmontelle was a garden designer, painter, playwright and entertainer of the aristocracy. About his transparencies, see Verwiebe (op. cit. 40), pp. 28-31. At least five of Carmontelle's roll paintings are believed to survive. The longest one, measuring 42 x 0.5 meters, is in Chantilly, France. It depicts the four seasons. The Getty Center (Los Angeles, USA) has one, known as "Figures walking in a parkland" (circa 1783-1800), executed in watercolor and gouache, with traces of black chalk. It depicts aristocrats biding their time in an imaginary picturesque garden landscape with both contemporary buildings and 'antique' remains. See Stafford/Terpak (op. cit. 44), p. 330.

68 Chatel de Brancion, Laurence: *Carmontelle au jardin des illusions*, Château de Saint-Rémy-en-l'Eau 2003, p. 199.

69 Boxed toy 'moving panoramas' with a similar arrangement were available in the 19th century, but they did not stem from Carmontelle's boxes. Rather, they were miniature versions of the professional moving panorama shows that enjoyed great popularity in the 19th century. By using them, or even building one's own, the children re-enacted the world of the professional entertainments in the domestic setting. See Huhtamo, Erkki: "Peristrophic Pleasures: on The Origins of the Moving Panorama", in: Olsson, Jan/Fullerton, John (Eds.): *Allegories of Communication. Intermedial Concerns from Cinema to the Digital*, Rome 2004, pp. 215-248 and Huhtamo (op. cit. 29).

70 The history of the device, and particularly the idea behind it, goes much further back in time. For a general history, see Hammond, John: *The Camera Obscura. A Chronicle*, Bristol 1981.

71 The rays of light entering the box through the lens were directed by means of an internal mirror (placed at 45 degree angle) on a horizontal glass 'screen' on top of the device. The act of sketching directly paper on the glass screen could be claimed to have anticipated the use of interactive touch screens or digital drawing tablets, at least as a behavioral mode. Such use of the device was individual and personal. The 19th century technical literature on photography used terms like the 'focusing screen', or the 'screen of ground-glass' (1879), to refer to parts of the camera. The last mentioned was defined as "a flat piece of glass on which the image formed by a camera lens is focused prior to making the exposure". This definition derives directly from the use of the ground glass

Yet there was also a collective mode of using the device. Room-sized camera obscuras, housed in little cabins, were built on picturesque locations like seashores, hilltops, parks and towers. The scenery from the outside was 'transmitted' by means of a lens and an angled mirror from the top of the cabin onto a horizontal table in the center of the darkened chamber.<sup>72</sup> Visitors observed the moving scenery, framed by the edges of the table and detached from its 'natural' soundscape. They pointed at details with their fingers, occasionally touching the image, and admiring the rustling leaves and the birds flying by in silent motion.<sup>73</sup> The principle of transmitting a live image in real time and presenting it on a surface for a group of spectators anticipates broadcast television. Phenomenologically, however, the situation differs from the ritual of watching TV. We use the remote controller to change the TV channel, but we don't physically touch the image. Although lacking interactivity, the collective camera obscura experience has some affinities with interactive touch-screen interfaces, experiences like using a virtual 'work bench' or a digital navigation map. In such applications the image is often projected on a table-like horizontal surface and manipulated with the finger-tips or 'wands'.<sup>74</sup>

In the cultural imaginary 'tele-vision' had been conceived long before the 1920s, the decade of the first successful television demonstrations and experimental broadcasts. The idea of seeing at a distance by means of a technological apparatus had been evoked in various contexts, for example in the debate surrounding the optical telegraph in the late 18th century.<sup>75</sup> Even such a seemingly quite different invention as the panorama had been connected with this idea. Although not an 'on-line medium', the panorama provided its audiences a 'look beyond the horizon', transporting them to view battlefields, great cities and other notable sights. It was a virtual voyaging medium. At home, the stereoscope fulfilled much the same purpose, in spite of using three-dimensional photographs instead of gigantic painted panoramas. When presenting something 'new', both inventors and publicists often search support from existing technologies and cultural forms. Thus it is not surprising that the prophecies about tele-vision were

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screen in a camera obscura. For these definitions see *Oxford English Dictionary* (op. cit. 13), Vol. XIV, "screen".

- 72 Olafur Eliasson had constructed such a camera obscura as part of his installation at the Danish Pavilion, Venice Biennale 2003.
- 73 This description is based on antique prints depicting people inside camera obscuras, but also on observing contemporary visitors' behavior at existing camera obscuras at San Francisco's Cliff House and in Santa Monica, Los Angeles.
- 74 Several media artists from Dalibor Martinis to Toshio Iwai and Perry Hoberman have used the idea of projecting images on a horizontal surface, letting users manipulate them directly.
- 75 The optical telegraph can be conceived as a combination of a semaphore-based signaling system and the telescope. For the debate around the optical telegraph, see Flichy, Patrice: *Une Histoire de la Communication Moderne. Espace Public et Vie Privée*, Paris 1991.

also inspired by magic lantern projections. In many cartoons and illustrations the tele-vision device is conceived as a personal table-mounted projector. Externally its design resembles a modernistic table lamp or a headlight rather than a traditional magic lantern, which was probably too imbued with 'passeistic' Victorian connotations. The lack of casing exposes the complex mechanism, reflecting the open design of telegraphs, phonographs and early radio sets. In illustrations, the projected imaginary tele-vision images are always round. Indeed, many magic lantern slides were round, although others, particularly photographic ones, were square.<sup>76</sup>

Instead of proposing a one-way broadcasting model, many early fantasies envisioned the tele-vision as a kind of picture-phone, a two-way system of communication.<sup>77</sup> These two models were not necessarily mutually exclusive, as is demonstrated by Albert Robida's *Le vingtième siècle* (1883), a prophetic illustrated novel about the future society totally permeated by 'telephonoscopic' communication.<sup>78</sup> In Robida's vision screens are everywhere, both in public and private spaces. They are used to transmit operas, theater plays and audiovisual 'telephonoscopic journals' to the home.<sup>79</sup> International 'broadcasts' offer French culture to African spectators (with an evident colonial bias). Telephonoscopes can also be used to intimate two-way meetings via the screen. In public spaces there are giant screens, erected on top of tall scaffoldings, transmitting realistic live

76 In a typical late 19th century magic lantern show round and square slides would often have alternated in a routine manner; this alternation was still felt in early films that included masked round images. Of course it is possible that in the cultural imaginary of the late 19th century lantern slides were conceived as round. Many round slides were handpainted in bright colors; most animated effect slides, such as the abstract chromatropes, were also round; these could have been stored in the cultural imaginary as pointers to the lantern show, rather than the black and white square slides.

77 Yet it should be remembered that many of the early uses of the telephone also anticipated broadcasting. The telephone was used to deliver radio-like programming, opera, sermons, even muzak-like background music to subscribers. In his novel *Looking Backward* (1887) Edward Bellamy described a home music room. As Michael Brian Schiffer explains, "After consulting a program that listed the day's offerings, the listener adjusted 'one or two screws,' which filled the room with music 'perfectly rendered.' The program came to every home via telephone from central music halls where the best musicians performed twenty-four hours a day. On Sunday mornings, there was even a choice of sermons." (Schiffer, Michael Brian: *The Portable Radio in American Life*, Tucson/London 1991, p. 12). About actual such systems in the late 19th century, see Marvin, Carolyn: "Early uses of the Telephone", in: Crowley, David/Heyer, Paul (Eds.): *Communication in History*, New York/London 1991, pp. 145-152.

78 Robida, Albert: *Le Vingtième Siècle*, Paris 1883 (Slatkine Reprints edition, Genève 1981). In a silent science fiction film titled *HIGH TREASON*, directed by Maurice Elvey (England, 1929) we see similarly screens serving different purposes. While the government broadcasts propaganda to public spaces via small screens placed everywhere, there are also flat panel screens in office for person-to-person communication. The flat panel screen can be lowered inside the desk after use.

79 Canto, Christophe/Faliu, Odile: *The History of the Future. Images of the 21st Century*, Paris 1993, p. 32.

broadcasts about the sacking of Peking and other world events, as well as advertisements for the department stores in Paris. The editorial building of L'Epoque, the audiovisual newspaper of the future, is a pavilion flanked by two giant round screens. Although these screens are not in a technical sense 'panoramic', their offerings certainly are. The role of L'Epoque evokes that of the circular panoramas, aptly characterized by Stephan Oettermann as a 'mass medium'.<sup>80</sup> While the panorama purported to give the audience glimpses of the world 'beyond the horizon', Robida's giant screens serve this goal in a much more direct manner. The panorama was always necessarily 'out of sync' with the current events; the audiences had to wait until the painting was finished. The public Telephonoscope screens give the 'breaking news' a new immediacy, turning them into a continuous online spectacle.

## 8 FROM ROUND TO SQUARE: TRANSITIONS IN DESIGN

What can be said about the forms and shapes of the screens in Robida's illustrations? Some of them are round, some of them are square. Their sizes vary. There is no discussion about the iconographic background of these choices, or about the technology supposed to be used. Referring to the traditions of displaying paintings or photographs in oval and round frames would be tempting but there is little to justify this.<sup>81</sup> It might be more interesting to refer to mirrors and crystal balls as possible iconographic models. In discursive traditions, both have been treated as 'windows' that allow a person to view events taking place elsewhere, sometimes in another temporal dimension, particularly in the future, but often also in the present. In both visual and literary traditions, including Shakespeare's *Macbeth* and Mme Le Prince de Beaumont's story *La Belle et La Bête* (1751), the inspiration for Jean Cocteau's feature film (1946) and Disney's recent animation, 'magic' or enchanted mirrors have frequently served as 'information surfaces' bridging time and space. In a well known 17th century print the sorcerer Nostradamus is seen performing a trick that could be classified as 'magic media': he makes the future kings of France appear in a square mirror, in front of the anxious eyes of the queen Catherine de Medicis. The position of the mirror above the fireplace easily evokes the TV screen. Art historian Jurgis Baltrusaitis even uses the metaphor 'catoptric television' (*téléviseur catoptrique*) when discussing such cases.<sup>82</sup> In the tradition of 'natural magic' mirrors had often been proposed as

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80 Oettermann, Stephan: *The Panorama. History of a Mass Medium* [1980], translated by Deborah Lucas Schneider, New York 1997. I have adopted this definition in my own work on the moving panorama, see Huhtamo (op. cit. 29).

81 The cultural meaning of round vs. quadrangular frames for displaying paintings and photographs is a very complex one, and cannot be dealt with here.

82 See Baltrusaitis, Jurgis: *Le Miroir. Révélations, Science-Fiction et Fallacies*, Paris 1978, pp. 184-187, 206-208. Reference to "*téléviseur catoptrique*" is on page 208. See also

means for reflecting and transmitting both text and images. In his *Ars magna lucis et umbrae* Athanasius Kircher makes several such proposals. In the early decades of the 20th century, the television set was openly compared to the crystal ball in both cartoons and in advertisements. Not only was the television a way to peeking into the future; it was also an example of modern wizardry, “man’s strangest dreams come true in your home ...”<sup>83</sup>

It cannot be denied that the tiny round screens of the TV sets in the 1920s and the 30s were to an extent determined by the technology. There were two competing television systems, the mechanical and the electronic. In the mechanical TV receivers the image was formed by means of a slotted spinning disc synchronized with a similar disc in the camera/transmitter at the transmitting station.<sup>84</sup> The transmitted image was simultaneously deconstructed and reconstructed by these discs. Even producing a small image with enough lines to make it clear enough required a fairly large spinning disc. In some early receivers, like the ones by John Logie Baird in England, the shape of the disc was echoed by the form of the cabinet, acknowledging its presence as a modern technological marvel. In most models, for example in Western Television’s ‘Visionette’ (USA, 1930), it was completely hidden inside a square wooden cabinet with a round viewing hole on its sparsely decorated front side. In electronic systems the image was formed on a round cathode ray tube by bombarding a fluorescent ‘screen’ with electrons emitted by a cathode ray gun.<sup>85</sup> Manufacturing large cathode ray tubes was difficult, which partially explains the small size of the screens in early electronic TV sets. The size of the cathode ray tube and consequently that of the TV screen increased gradually as the design and manufacturing methods improved. As a temporary solution to enlarge the image, round magnifying lenses were sometimes fixed in front of the screen giving it a ‘fishbowl’ look.

There are intriguing similarities between the early TV sets and the peepshow boxes of the past. Sometimes the similarities were even structural. A prominent model in the 1930s and 40s, the upright floor-standing cabinet TV, contained the cathode ray tube in a vertical position, pointing upwards. One opened the hori-

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Melchior-Bonnet, Sabine: *The Mirror. A History*, translated by Katharine H. Jewett, New York/London 2002, pp. 108-110, 195-196.

- 83 For examples, see Herzogenrath, Wulf et al. (Eds.): *TV Kultur. Fernsehen in der Bildenden Kunst seit 1879*, Amsterdam/Dresden 1997, p. 146, 147, 157.
- 84 The origins of the mechanical scanning disc go technically back to a patent applied for by the German Paul Nipkow in 1884, yet Nipkow never built a functioning apparatus. An intriguing thing is the close formal resemblance between Nipkow’s disc and some ‘pre-cinematic’ devices, such as Georges Demeny’s Phonoscope and Ottomar Anschütz’s Electrotachyscope, conceived at the same time. Both Demeny and Anschütz used a spinning disc. The images were viewed through a peep hole, although even a projecting version was available.
- 85 The first cathode ray tubes were created around the turn of the 19th and 20th centuries. This was also the pioneering era of X-Rays. The fluorescent surfaces on which X-Rays could be detected were also called screens. The relationship between X-Rays and television needs elaboration.

zontal top lid and fixed it in an oblique angle. The screen was only visible via a mirror attached to the inside of the lid. This design could be explained by both technical and cultural factors: because cathode ray guns for larger screens had to be very long, placing them vertically made sense: an upright cabinet took less space. The design hid the television technology itself from view; when it was not used the TV set was disguised as a normal cabinet, a piece of furniture. The novelty of the television was not denied, but it was subsumed within the ideology of the a-technological domestic interior. Even the contact with the screen was mediated – one looked at a mirror, not at a cathode ray tube. It is intriguing to note that the relationship between the horizontal screen, the mirror and the spectator closely resembles that of the zograscope and the vertical peepshow box (analyzed earlier). Can such parallels be coincidental? Do they imply some hidden ‘logic’ controlling the evolution of cultural artifacts? It seems safe to say that in this case a similar solution to arrange the viewing apparatus was used in two different cultural contexts for similar purposes: to serve as virtual windows to observe distant lands and current events with supra-local significance.

Yet one should not neglect the differences. The peep show literally contained the views. To observe them, one had to peep *through* the lens. In the early TV sets, the images were also ‘in the box’, but they were either close to the screen (mechanical systems) or formed on its surface (electronic systems). Even though photographs show us people leaning toward the early TV sets to perceive the image, they still maintain some distance.<sup>86</sup> Even from close range a group of people can witness the minuscule spectacle together. No-one is blocking the hole; there is no need to queue. The same can be said about the mirror-cabinet-TV’s: the elimination of the lens turns the mirror into a surface for collective viewing, although this by no means excludes the possibility of individual spectatorship. Even though devices like wristwatch-TV’s have clearly been designed for individual spectatorship, most TV designs leave the options for use open.<sup>87</sup> One should not confuse television technology with its cultural form, to follow Raymond Williams’s useful distinction.<sup>88</sup> Television technology was not determined to serve certain social or ideological purposes; its uses were defined by contextual factors. Still, television design may point towards certain types of applications. As the TV screen gradually grew larger, collective spectatorship (in the living room, in a bar) became easier. Simultaneously the viewers often distanced themselves from the device itself; this ‘movement’ was effected by the invention of the

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86 Interestingly, in some early mechanical TV’s one had to adjust the synchronicity between the spinning discs constantly by turning a button. Thus there was an ‘interactive’ relationship between the user and the machine – however, it only affected the quality of the signal, not the content of the broadcast.

87 Video projectors are of course an intermediate solution. Projected television images that were often anticipated by late 19th and early 20th century cartoonists, became technically feasible already in the 1930s, although their use remained somewhat limited.

88 Vgl. Williams, Raymond: *Television. Technology and Cultural Form*, London 1974.



remote controller in the 1950s.<sup>89</sup> The idea of close, tactile personal relationship with the screen was essential to 'proto-interactive' TV programs like *Winky Dink and You*.<sup>90</sup> Children were asked to draw directly on the screen (actually on a transparent plastic sheet attached to it). Although *Winky Dink and You* created no tradition, direct tactile manipulation of the screen became a central cultural form with the emergence of interactive computing.

From a media archaeological point of view it is intriguing that round television screens were used in many television sets until the 1950s.<sup>91</sup> During the 50s the square shape with rounded corners came to dominate, eventually to be replaced by the current flat 'panoramic' rectangular screens with sharp corners.<sup>92</sup> Why did this happen? Pointing to the technical evolution of the cathode ray tube is one solution, but not a sufficient one. Even before 'flattened' cathode ray tubes became generally available, the manufacturers had begun to mask the upper and lower edge of the tube to give the screen a more quadrangular look; eventually even the sides were 'straightened out'.<sup>93</sup> Both technical possibilities and design solutions must coincide with cultural reasons and a desire from the part of the public. The shift from round to square screen was related to television's relationship with other media, particularly the cinema. As is well known, at home the television set came to occupy a cultural position prepared not only by phenomena like stereoscopy, but also by radio broadcasting. In a sense, the TV set replaced radio as the center of attention in the domestic setting. Although radio was not a visual medium, it certainly attracted gazes during the act of listening. In many early television sets the screen has appeared on the place occupied by the

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89 The need to sit further from the TV screen was also justified by medical reasons: a belief, according to which watching television from too close will damage the eyes. This discussion could be compared to the radiation/cancer debate surrounding cell phones today.

90 Children were encouraged to draw on the television screen (actually on a sheet of transparent plastic attached to the screen) by 'Magic Pens' according to the instructions given by host John Barry. The activity of the child drawing with his or her Magic Pens is not all that different from that of an 18th century artist sketching a landscape with the help of his camera obscura. The spectatorial model proposed by *Winky Dink and You* never became a standard in TV broadcasting, but anticipated educational digital multimedia for children and in a way electronic gaming.

91 This chapter is partially based, in completely re-written form, on my earlier article "Seeing at a Distance. Towards an Archaeology of the 'Small Screen'", in: Sommerer, Christa/Mignonneau, Laurent (Eds.): *Art@Science*, Vienna/New York 1998, pp. 262-278.

92 For visual anthologies of TV designs, see Collins, Phillip: *The Golden Age of Televisions*, Los Angeles 1997; Wood (op. cit. 66). These are invaluable sources for a design history of the TV set, rarely found in any academic libraries.

93 In any variation, the corners remained rounded. The only way to produce a quadrangular screen with straight corners was to use a back-projection system inside the television cabinet. Early examples include RCA 741 PCB (1947) and Scott 6T11 (1949). Both pictured in Wood (op. cit. 66), p. 73, 75.

loudspeaker.<sup>94</sup> The position and round shape of the loudspeaker was often 'imprinted' in the design of the radio set, which may give an additional explanation to the dominance of round screens in the early TV sets. As the cultural position of television became stronger in the 1950s, it entered into open competition with the cinema. Television could not compete with the size of the screen, but making it square could be read as a symbolic challenge. There is also a more concrete explanation: showing old movie serials and Hollywood films became an important part of the TV programming, forcing the TV manufacturers to simulate the ratio of the cinema screen.<sup>95</sup>

This article has not dealt with the history of the screen in all its manifestations. The aim has been simply to excavate certain important issues related to the cultural and historical understanding of screens as information surfaces, erecting pointers towards the needed, but not yet existing discipline of 'screenology'. Numerous other issues need attention. The computer screen and its 'archaeology', for example, warrant a study of its own, extending the pioneering efforts by Lev Manovich and Anne Friedberg.<sup>96</sup> Another issue that waits for exploration is the emergence and background of portable mobile screens, currently proliferating on mobile phones, game consoles, PDA's and other platforms. Cultural forms do not appear out of nowhere; they are based on earlier cultural manifestations, both material and discursive. Earlier phenomena can provide the newcomers 'molds' that will facilitate their cultural reception and evolution. Eventually these molds are discarded – like cocoons – but they may later re-appear in another context. Because culture is a layered construct, it is sometimes difficult to decide which factors are the determining ones. Furthermore, all the contributing factors are not necessarily understood by the historical agents themselves. When Francis C. Jenkins began his experimental television broadcasts in 1928, he broadcasted moving silhouettes (or shadow figures) of humans and animals. He may have done so because his primitive system could display moving outline figures far better than complex textures and facial features. Yet, perhaps unaware, he was also associating television with the earliest of all screen practices, the shadow theatre, still alive in miniaturized form in bourgeois homes in the early 20th century.<sup>97</sup>

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94 This point is supported by a newspaper cartoon by Arthur Ferrier (England, 1928). We see a couple in an armchair, staring intensely what seems to be an ordinary radio set with a horn loudspeaker. The opening of the horn, however, is a round screen displaying images! The caption says: "A Vision of the Near Future. Listening and seeing at the same time". Reprinted in: Herzogenrath (op. cit. 83), p. 154.

95 The recent proliferation of 'wide-screen' television sets could be partly explained by similar reasons: the screen ratio simulates that of widescreen films – at the same time original TV programs can be produced in the wider format, providing a competitive position against cinema.

96 See Manovich (op. cit. 9); Friedberg (op. cit. 5).

97 The elaborate boxed shadow theatres that enjoyed great popularity in the late 19th and early 20th century bourgeois homes could be associated to the history of television via this link. Both formally and for their spectatorship they anticipated television.