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Erkki Huhtamo

### **Elements of Screenology: Toward an Archaeology of the Screen**

“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 Cyclopaedia*, 1911 (orig. 1889)

An increasing part of our daily lives is spent staring at screens. Some of them, like cinema screens and Jumbotron-like giant outdoor displays, are located in public spaces, while others are part of our privacy. Since the mid 20th century, television screens have become a permanent feature of millions of households around the globe. Today the forms of “TV culture” may seem homogeneous and even stereotypical. Yet during the “interfacial invasion” of the television set, the cultural role and even the “nature” of the TV screen has been constantly changing. It has been effected by changes in technology, social practices, broadcasting policies and design philosophies, but also by the addition of 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 with the TV screen for the home user’s attention. These two have often been prophesized to merge into a single convergent multimedia terminal. 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>1</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. A design for the automobile of the future would be unthinkable without the presence of a whole variety of different screens.<sup>2</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.

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<sup>1</sup> Anna McCarthy: *Ambient Television. Visual Culture and Public Space*. Durham and London: Duke University Press, 2001.

<sup>2</sup> See Keith Naughton: “Living Room, to Go”, *Newsweek*, Nov.25, 2002, pp.62-66.

Devices like cell 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 a wallet (essentially a no-tech multimedia center with photographs, phone numbers, credit cards, etc.). While we leave our TV sets and PlayStations behind from time to time, the 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>3</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 artefacts, 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 and Lev Manovich's studies on the genealogy of the computer screen.<sup>4</sup> Additional insights may be found from theories of visual culture, particularly from texts dealing with visual representation and the cultural contextualisation of images. 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.

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<sup>3</sup> 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.

<sup>4</sup> 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 *The Cinematic Apparatus*, edited by Teresa De Lauretis and Stephen Heath, London and Basingstoke: Macmillan, 1980; Siegfried Zielinski: *Audiovisions. Cinema and Television as entr'actes in history*, translated by Gloria Custance, Amsterdam: Amsterdam University Press, 1999 (orig. in German 1989); Margaret Morse: *Virtualities. Television, Media Art, and Cyberculture*, Bloomington and Indianapolis: Indiana University Press, 1998, pp. 71-98; Lev Manovich: "Towards an Archaeology of the Computer Screen", *Cinema Futures: Cain, Abel or Cable? The Screen Arts in the Digital Age*, edited by Thomas Elsaesser and Kay Hoffmann, Amsterdam: Amsterdam University Press, 1998, pp. 27-43 and Manovich: *The Language of New Media*, Cambridge, Mass.: The MIT Press, 2000, pp. 94-111 (see note 4.).

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>5</sup> As applied 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 trajectories of screens as realized artefacts 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. Seen from such a perspective, “screen” is a complex cultural phenomenon that avoids easy generalization. Media archaeology can help 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 about by social and cultural phenomena like the massive use of cell phones or the emergence of electronic gaming. Yet, uncritical emphasis on novelty and innovation may also be misleading. By mapping phenomena claimed to be “without precedent” within wider cultural frames of reference we may be 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 at length on the archaeology of the “small screen”, excavating the various ways and forms in which it entered the domestic sphere. Finally, I will provide some preliminary thoughts toward an archaeology of mobile screens. 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 types of sources. The approach is justified by the lack of literary sources on many of the issues I am dealing with. For a short study, some omissions have been unavoidable. Certain issues, like the habit of framing still images and displaying them 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 images that “come alive” and even communicate with human subjects, I have chosen to concentrate here on “proto-screens” that are more closely connected to 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

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<sup>5</sup> 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: “Media Archaeology”, in *Digital Delirium*, edited by Arthur and Marilouise Kroker, New York: St. Martin’s Press, 1997, 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 *Electronic Culture. Technology and Visual Representation*, edited by Timothy Druckrey, New York: Aperture 1996, 296-303, 425-427

of culture as real and important as materialized ones.<sup>6</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.

### “Screen”: Etymologies and Semantic Shifts

Tentatively defining a screen as an “information surface” 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 Vilem Flusser has remarked, screens also have some characteristics of the door - they let us “enter” the realm they depict.<sup>7</sup> This is particularly the case with interactive screens, but applies more metaphorically to other situations 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>8</sup> Manovich’s classification is confusing. 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>9</sup> Manovich’s discussion of the history of the screen is too schematic, and 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>10</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>11</sup> Such generalizations are hard to accept in the light of historical evidence. Screens have been constantly changing and redefined as part of different cultural apparatus. What constitutes “typical” anyway? Is the “typical” film screen that of the 1930s sound film era, or the wide angle screen of today’s cinemas? The meanings of “typical” are context specific, not universal. The genealogy of the screen is much more complex than the version Manovich has presented.

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<sup>6</sup> See, for example, Walter Benjamin: Charles Baudelaire. A Lyric Poet In The Era Of High Capitalism, Translated by Harry Cohn, London: Verso, 1983; Wolfgang Schivelbusch: Disenchanted Night: The Industrialization of Light in the Nineteenth Century, Berkeley: University of California Press, 1988; Carolyn Marvin: *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century*, New York and Oxford: Oxford University Press, 1988.

<sup>7</sup> Vilem Flusser, "Two approaches to the Phenomenon, Television", *The New Television: A Public/Private Art*, edited by Douglas Davis and Allison Simmons, Cambridge, Mass.: The MIT Press, 1977.

<sup>8</sup> Manovich: *Language of New Media*, Cambridge, Mass.: The MIT Press, 2000, p.103.

<sup>9</sup> *Ibid.*, p.96.

<sup>10</sup> *Ibid.*, p.95.

<sup>11</sup> *Ibid.*, p.95.

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>12</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”. The screen meant usually 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>13</sup> In addition to their main purpose, decorated hand-screens were -- like fans -- also objects of fashion, aesthetic pleasure, and erotic play. 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>14</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* is from 1810: “To make Transparent Screens for the Exhibition of the Phantasmagoria”.<sup>15</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>16</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

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<sup>12</sup> 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 II edition, edited by J.A. Simpson and E.S.C. Weiner, Oxford: Clarendon Press, 1989.

<sup>13</sup> Oxford English Dictionary, vol XIV, “screen”.

<sup>14</sup> The Century Dictionary and Cyclopedia (CDC), New York: The Century Co, revised and enlarged edition, 1911 (orig. 1889), Vol VIII, “screen”.

<sup>15</sup> Oxford English Dictionary, vol XIV, “screen”.

<sup>16</sup> 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*. Paris: Musée national des techniques, CNAM, 1990. About the contemporary reception of Robertson Fantasmagorie in Paris, see Jann Matlock: “Voir aux limites du corps: fantasmagories et femmes invisibles dans les spectacles de Robertson”, in *Lanternes magiques. Tableaux transparents*, edited by Ségolène Le Men, Paris: Reunion des Musées Nationaux, 1995, pp.82-99.

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. This anticipated the “logic of attraction”, so central to the world of 19th century entertainments.<sup>17</sup>

## What Constitutes the History of “Screen Practice”?

Although the word “screen” may not have been used about public projections before 1810 (at present we don’t know for sure), the phenomenon labelled by Charles Musser as “the history of screen practice” certainly existed earlier.<sup>18</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>19</sup> Magic lantern shows had been organized since the second half of the 17th century.<sup>20</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>21</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.

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

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<sup>17</sup> 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 *Early Cinema: Space, Frame and Narrative*, edited by Thomas Elsaesser with Adam Barker, London: BFI, 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 Richard D. Altick: *The Shows of London*, Cambridge, Mass.:The Belknap Press of Harvard University Press, 1978.

<sup>18</sup> The word “screen practice” was coined by Musser. See his *Emergence of the Cinema: The American screen to 1907*, *History of the American cinema*, vol.I, Berkeley and Los Angeles: University of California Press, 1994, chapter one, “Towards a History of Screen Practice”.

<sup>19</sup> Musser, op.cit., p.15.

<sup>20</sup> A rich resource on the history of the magic lantern is the *Encyclopedia of the Magic Lantern*, edited by David Robinson, Stephen Herbert and Richard Crangle, London: The Magic Lantern Society, 2001.

<sup>21</sup> Numerous prints and paintings about magic lantern shows help us define the role of the screen (see David Robinson: *The Lantern Image. Iconography of the magic Lantern... Supplement..* 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 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.

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>22</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>23</sup> Particularly during the second half of the century, the magic lantern show became increasingly sophisticated, attracting much larger crowds 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>24</sup> This was partly made possible by technical improvements, better optics and new powerful illuminants (oxy-hydrogen limelight, electric carbon-arc).<sup>25</sup> Parallel to this development, simple magic lanterns became widely 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. Adventurous 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

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<sup>22</sup> 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 more faint. 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." (David Brewster: *Letters on Natural Magic*, London: John Murray, 1833, p.80).

<sup>23</sup> Oxford English Dictionary, vol XIV, "screen". Entry from 1846.

<sup>24</sup> 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.

<sup>25</sup> 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-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).

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 peep show 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>26</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”. I have not been able to establish this fact with certainty.

In spite of its usefulness, Musser’s way of using the concept screen practice also 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 of films as a public spectacle, but that had nevertheless an established position in the world of public spectacle.<sup>27</sup> The moving panorama, for example, enjoyed widespread popularity, often competing for audiences with the magic lantern show.<sup>28</sup> It was not a projection-based form, at least not primarily (back-projected elements could be used as a “special effect” as in the tradition of the 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 sitting opposite the painting in the auditorium. Music and sound effects were also used. In spite of evident technical and aesthetic differences, the viewing situation had many similarities with the magic lantern show. As travelling media experiences both shows were often presented in the same venues from local opera houses to churches. From a cultural point of view the moving panorama was a form of “screen practice”.

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 and Indonesia to China and Japan hundreds of years ago. These traditions had matured long before they were introduced in Europe in the late 17th century.<sup>29</sup> Although technically a live performance, the shadow theatre qualifies as a

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<sup>26</sup> OED, “screen”.

<sup>27</sup> This reminds one of the positivistic and teleological reading of the “pre-history” of the cinema in C.W. Ceram’s (Kurt Mazur) *Archeology of the Cinema*, London: Thames and Hudson, 1965.

<sup>28</sup> See my “Global Glimpses for Local Realities”.

<sup>29</sup> See Olive Cook: *Movement in Two Dimensions*, London: Hutchinson, 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 *Theatres d’Ombres. Tradition et Modernité*, edited by Stathis Damianakos with Christine Hemmet, Paris: Institut International de la Marionette/L’Harmattan, 1986.

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>30</sup> The spectators are normally allowed to see the moving shadows on the screen, not the “machinery” animating them.<sup>31</sup> This 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>32</sup> Similarly, the Japanese Utsushi-e tradition, which began in the early 19th century (nearly simultaneously 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>33</sup>

For an archaeology of the screen the shadow theatre is interesting not only as a 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, yet shadow shows could easily also 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>34</sup> The 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>35</sup> In one of those cases that literally begs to be assigned symbolic significance, Félicien Trewey, the most well known of the Ombromanes, became a manager for Lumière brothers, the French film pioneers. Rapidly switching from one form of screen practice to another, he became the Lumière’s manager in England, now promoting their invention, Le

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<sup>30</sup> 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.

<sup>31</sup> 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.

<sup>32</sup> Brewster, op.cit, p.82.

<sup>33</sup> 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 Minwa-za in Tokyo.

<sup>34</sup> 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 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.

<sup>35</sup> 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.

Cinématographe.<sup>36</sup> Many magic lantern showmen made a transition equally smooth, 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.

### The “Small Screen”: the Origins

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, for example, possible to establish a link between domestic fire screens and the later media screens? At first their functions seem quite different. Yet it may not be totally irrelevant to note that from the early times fire screens were often embellished with ornaments and even with pictures. Particularly during the Victorian era the large folding screens used in the homes of the bourgeoisie to divide spaces (and to serve as fire screens as well), were often covered with printed scraps, colored lithographs and other types of mass-produced images.<sup>37</sup> They became veritable collages, bringing into mind the countless “scrap books” created by women and children in their spare time.<sup>38</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 with such screens.

Victorian decorated screens can be considered “information surfaces” only indirectly, with the help of 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. Yet, it should be noted that screens were also used for displaying translucent images since the late 18th century, in settings that

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<sup>36</sup> 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 Colin Harding and Simon Popple: *In the Kingdom of Shadows. A Companion to Early Cinema*, London: Cygnus Arts & Fairleigh Dickinson University Press, 1996.

<sup>37</sup> 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*, 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.

<sup>38</sup> 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.

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>39</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 that contained 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>40</sup>

Beside their evident decorative function, the lithophane viewers also 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 one permanent view, the images could be easily changed. Before they could be enjoyed, they had to be "switched on" by lighting a candle behind them. Placed in display frames they 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 may be, both moonlight transparencies and lithophanes have limited relevance as precedents to the later media screens. After all, they were primarily a form of decoration and interior design. In the 19th century, the fashion for panoramic wallpaper transformed the saloon in a slightly more radical manner. The interior could be turned into a simulated exterior complete with trees, houses and painted birds frozen in mid-air. With this vogue the issue of the screen temporarily retreated to the background - the inhabitants were as if permanently living in a virtual environment; the sense of the frame had disappeared. However, after the novelty value had dissipated, the static nature and the constant presence of the panoramic interior probably de-emphasized its role as a "virtual reality" and brought it back to the realm of interior decoration. Although not totally unrelated, it would be an exaggeration to define a living room decorated with illusionistic panoramic wallpaper as a "19th century holodeck".

## Peeping, the Body, and the Social

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<sup>39</sup> 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*, Bonn: Kunst- und Ausstellungshalle der Bundesrepublik Deutschland & Stroemfeld/Roter Stern, 1993, 198-199. See also Birgit Verwiebe: *Lichtspiele. Vom Mondscheintransparent zum Diorama*, Stuttgart: Füsslin Verlag, 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: Andreas Blühm & Louise Lippincott: *Light! The Industrial Age 1750-1900. Art & Science, Technology & Society*, New York: Thames & Hudson, 2001, p.97.

<sup>40</sup> There were also tiny erotic lithophanes that were kept in small pocket cases, and held out against the light only intermittently in appropriate circumstances.

The “proto-screens” analysed so far provided new surfaces for 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 middle of the 18th century we also discover devices that could be characterized as proper “media machines” for the home, meant for the consumption of views produced for the 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 it is important to note that already before entering the saloon such devices seem to have been used as public entertainments appealing to a different audience. From the 18th century on, the dynamic relationship between the public and the private use of such apparatus 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 the viewing machine was that of peeping. The views were hidden inside a box, and to access them one had to glue one’s eye(s) to an opening provided with a magnifying lens.<sup>41</sup> Illumination was provided by candles or by opening and closing “doors” at the sides of the box. The display of curiosities in such a manner in itinerant peep shows (also known as the “Raree Show”) was obviously based on economic calculation.<sup>42</sup> Almost anything could be made attractive by initially disguising it from the gaze and preparing the experience by verbal promises, hints and suggestions. A coin provided the means 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 visuals 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>43</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

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<sup>41</sup> For a general history, see Richard Balzer: *Peepshows. A Visual History*, New York: Harry N. Abrams, 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.

<sup>42</sup> There is a huge literature on the history of curiosities and curiosity cabinets. For a recent overview, see Stafford and Terpak, *op.cit.*

<sup>43</sup> I will exclude psychoanalytical analyses of peeping from my article, and concentrate on its cultural and social implications.

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 a 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>44</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.

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 behaviour, 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>45</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>46</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

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<sup>44</sup> 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 apparatus were of course quite different.

<sup>45</sup> 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 with this issue, but it became well known in early 20th century with the emergence of kinoscope parlors and nickelodeons. See Lary May: Screening the Past.....

<sup>46</sup> 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.

mother, bent over the peephole.<sup>47</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 pickpocket emptying a male peeper's pockets is clearly invested with latent homosexual overtones.<sup>48</sup> The peeper experiences the pickpocket's touches as erotic, and the position of the male bodies suggests an anal intercourse.

### Peepshows, Zograscopes 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>49</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.

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<sup>47</sup> 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.

<sup>48</sup> Reproduced in Stephen Bottomore: *I Want to See this Annie Mattygraph. A Cartoon History of the Coming of the Movies*, Pordenone: Le giornate del cinema muto, 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.

<sup>49</sup> 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, *op.cit.*, p.180.

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>50</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>51</sup> At 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.

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.<sup>52</sup> 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 behaviour:

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<sup>50</sup> 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.

<sup>51</sup> 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 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.

<sup>52</sup> Engraving by J. Henriquez, after F. Eisen the Elder. À Paris chez Buldet, rue de Gèvres. Reproduced in Laurent Mannoni: *Trois siècles de cinéma: de la lanterne magique au Cinématographe*, Paris: Editions de la Réunion des musées nationaux, 1995, p.54. The original French text is as follows: “Nicolle 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”.

which of the girls behaves properly, the one who turns away or the one who keeps on staring?

Parallel with the peepshow box, another device gained ground. Introduced around 1750, it was known by many names: “zograscope”, “l’optique”, “diagonal optical machine”, etc..<sup>53</sup> Technically it was a combination of a round magnifying lens and an adjustable square mirror behind it, both fixed on a vertical wooden table stand. Viewed with this device the widely available perspective prints (or “Vues d’Optique”) were magnified and their perspective effect enhanced. This was achieved by simultaneously lengthening the physical distance to the print (placed flat on the table behind the device) and shortening it optically - the eyes of the viewer “travelled” into the depth of the print. Erin C. Blake has recently proposed that this device is actually a neglected predecessor to the stereoscope, which was invented only in the 19th century. According to her view, supported by some contemporary texts, the lens/mirror combination not only enhances the depth illusion of the perspective print, but causes an actual physiological transformation in the viewer’s mind: the viewer perceives the print as an illusionary 3-D environment. For the critical discourse on visual culture this argument is tempting, because it would potentially force us to rewrite much of the theory concerning the discoveries of the early 19th century physiology of vision and their consequences to the emergence of modernism.<sup>54</sup> The effect is, however, very slight, as I have concluded after testing it with several original zograscope and numerous perspective prints. Although the 18th century viewers may have experienced it differently, the effect now feels more like an optical enhancement rather than a genuine physiological-optical transformation of the original source. On the contrary, the 3-D effect achieved by the stereoscope is equally effective today as it was in the 1850s.

For us the most interesting aspect of the zograscope is its relationship to the peepshow box.<sup>55</sup> Indeed, technically it could be characterized as a peepshow without the box. The relationship between the lens, the mirror and the print is similar to that found in the upright peepshow boxes (like the one in the print analysed above). The effect, however, is quite different, as Jean-Jacques Rousseau observed. Laurent Mannoni has located a letter by Rousseau (December 20, 1764), in which this expresses his disappointment about the zograscope, still a relative novelty at the time. Rousseau was bothered by the light that falls on the print from all directions by the fact that the openness of the structure lets the immediate surroundings around the print remain visible.<sup>56</sup> For Rousseau the proto-Romantic, the solution to the problem was the peepshow box (in French, “b<sup>o</sup>ite d’optique”) that contains the print in its darkened interior and allows the amount and direction of the light let inside be controlled precisely (from the backside of the box). As Rousseau’s letter

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<sup>53</sup> For an informed discussion about its principles and those of the vues d’optique, see Kees Kaldenbach: “Perspective Views”, available on-line at <http://www.xs4all.nl/~kalden/auth/perspectiveviews.htm> (originally published in *Print Quarterly*, June 1995).

<sup>54</sup> I am referring to the extensive debate inspired by the publication of Jonathan Crary’s *Techniques of the Observer*, Cambridge, Mass: The MIT Press, 1991.

<sup>55</sup> While the peepshow box existed both as versions for private and public consumption, the zograscope was clearly a device for exclusively domestic use. Its structure would not have worked in the public viewing context.

<sup>56</sup> Laurent Mannoni: *The Great Art of the Light and the Shadow*, Exeter University Press, 2000 (orig. French 1994), p.

demonstrates, the presence of the box made a difference. In addition to focusing the observer's attention exclusively on the image, the box excludes the surroundings, providing an experience of visual immersion, anticipating virtual reality.<sup>57</sup> Arguably this experience is more intense and intimate than the one provided by the zograscope. For the people gathered around a zograscope there was no strict separation between the acts of peeping and non-peeping.<sup>58</sup> The prints could be passed from hand to hand and observed either with the device or without it in much (but not quite) the same manner. The peepshow box emphasized the emotion of immersion, while the zograscope foregrounded study, content and social interaction. It is tempting to associate its open structure with the Enlightenment rationalism, linking the peepshow box with the Romantic mind. In reality, both devices remained in use parallel to each other; the same supply of prints was used in both.

### 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>59</sup> It was produced in various finishes from relatively plain to 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

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<sup>57</sup> Peep show boxes presented the image within a rather tight framing, a kind of "stage opening". An exception are the so called "perspective boxes" painted by artists like van Hogstraaten to demonstrate their skills. These boxes provided an illusion of a complete interior, sometimes created with a combination of trompe l'oeil painting and carefully placed mirrors.

<sup>58</sup> There were also versions with two lenses side by side, although these were much less common than the single lens models. There is an example in the author's collection from the early 18th century.

<sup>59</sup> 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 d'optique". The Megalethoscope 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 Megalethoscope thus reveals that it was meant for social, rather than solitary sessions.

designs in the next century. Megalethoscope 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. The cabinet stereoscopes could contain hundreds of stereocards. Special storage cabinets for the views were also available. By the 20th century, millions of viewers and views had been sold. The scientific principle of stereoptic vision had been demonstrated by Charles Wheatstone in the 1830s. He created an open device which used two angled mirrors to align the two images, drawn from slightly different angles to correspond with the parallax difference of the human eyes. For a scientific demonstration instrument the openness of the structure had both a practical and a symbolic justification. When it was turned into a commodity, the stereoscope was marketed in lenticular form, invented by David Brewster. A stereoscopic pair of photographic images was put inside a wooden box and observed through a pair of lenses on its side. Such viewers “contained” the stereograph in the manner of the peepshow boxes of the past. In the late 1850s a cheap and practical hand-held model known as the Holmes-Bates stereoscope was brought to the market. In a way it was hybrid of the Wheatstone and the Brewster viewers. The stereoview was placed on an open slider which was adjusted manually to find the right focus. The lenses were under a viewing “hood”. By the late 19th century such simple but effective viewers were practically everywhere.<sup>60</sup> They were used both at homes and classrooms and even given away by companies using collectable stereocards to advertise their products, from coffee to cereals.

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>61</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 favourite topics. During the second half of the 19th century the stereoscope developed into a veritable “virtual voyaging” tool.<sup>62</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

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<sup>60</sup> The stereoviewers found in remote areas like Finland still today are usually of this type. Most likely most of them were sent or brought back from the United States by emigrants. For them it was an impressive but affordable gift, that could give a clear idea of their new living surroundings to those who remained in the old mother country.

<sup>61</sup> 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.

<sup>62</sup> 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. Asa Briggs: *Victorian Things*, London: Penguin Books, 1988, p.247. Briggs also writes about the importance of the stereoscope (pp. 132-133).

delivered in handsome boxes that looked like books.<sup>63</sup> Favourite topics, already familiar from the 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>64</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>65</sup> In spite of the massive cultural presence of the stereoscope, few contemporary testimonies about its popular reception exist. There exists, however, an extensive iconography about its uses.<sup>66</sup> There is, for example, an interesting genre of “self-reflective” stereoviews and other images showing users actually peering into the device. Although such stereoviews were often produced as marketing gimmicks by the publishers, they nevertheless provide us clues about the ways people used stereoscopes and fantasized about them. One also finds views in which the stereoscope has been “accidentally” left on the table, confirming its presence as part of the Victorian interior. Likewise, in cabinet portraits shot at professional photographers’ studios stereoscopes and stereoviews were used as props, held by the sitters or placed on a table next to them. This convention associated people with optical technology, naturalizing its presence.<sup>67</sup> It would be

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<sup>63</sup> 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.

<sup>64</sup> 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 Lynn Spigel: *Make Room for TV. Television and the Family Ideal in Postwar America*. Chicago and London: University of Chicago Press, 1992, p.11.

<sup>65</sup> 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.

<sup>66</sup> This paragraph is mainly based on the analysis of original stereocards, cabinet cards and *carte de visites* in the author’s collection.

<sup>67</sup> Because many photographers produced stereoviews as well, it can also have been a subliminal marketing trick. Tall cabinet stereoscopes were also used as stands for leaning in portraits of standing people, taking the place of a table or a flower stand. Although a well known piece of Victorian optical culture, novelty stereoscopes were constantly brought to the market. At the Paris World’s Fair of 1900, great numbers of Holmes-Bates stereoscopes with aluminium (a novelty at the time) hoods were sold.

interesting to find out if the stereoscopes featured in such portraits also carried symbolic meanings, or if they were just what they seem to be - props.<sup>68</sup>

Contrary to what one might expect, images with a single person immersed into the stereoscope are rather rare, at least compared with images of families or groups of friends spending time together with the stereoscope in a salon or a drawing room. This is surprising, because as an apparatus the stereoscope seems to encourage solitary immersion - it does not provide a screen for several people to watch together.<sup>69</sup> Yet as Raymond Williams convincingly demonstrated, technology itself does not define the cultural forms it will be given.<sup>70</sup> In a typical situation people are seen sitting around a table, browsing stereocards and passing the stereoscope from hand to hand. Sometimes they are seen sitting in armchairs and sofas viewing stereocards while being engaged also in other activities, such as knitting, reading or playing with toys. This anticipates the rituals of watching television. The rarity of the solitary "virtual voyager" may of course be a bias caused by the nature of the source material. The iconography identifies the stereoscope as a parlor instrument, which no doubt attracted both solitary and social viewing. Although no sources that I am familiar with associate the stereoscope explicitly with the preceding peepshow tradition, the migration of iconographic formulas or "topoi" makes this continuity clear.<sup>71</sup> A familiar motive shows a door-to-door salesman of stereographs visiting a home. While the husband peeps into the stereoscope, looking at the samples, the salesman kisses his wife behind his back. The same topos was well known decades before the introduction of the stereoscope and had appeared in connection with other optical novelties - peep shows, kaleidoscopes, telescopes and even photographic cameras. In all these cases, excessive interest in an optical novelty and the resulting immersion disturbs the subject's mastery of the surrounding physical

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<sup>68</sup> In a cabinet card in my collection, newly wed couple is seen in their marriage photo holding a stereoscope and stereoviews. The stereoscope, with its "global" vision and its association with emerging modernity, may represent an optimistic and forward looking attitude, a peak into the hoped-for but not yet reached future for the couple. In the Hollywood musical *Story of Irene and Vernon Castle* (1938) the stereoscope is used in a similar way - the young couple (played by Fred Astaire and Ginger Rogers) is communicating about their marriage intentions obliquely by viewing stereocards of the Niagara Falls (a popular honeymoon destination) in a Holmes-Bates stereoscope. However, in my collection I also have cabinet cards of older couples, with the stereoscope placed on the table between them. Groups of children were also often photographed with the stereoscope and stereocards.

<sup>69</sup> There are some cases, in which the presence of the stereoscope on the table seems to be associated with dreaming or visions, represented by a figure "appearing" in the image (a kind of composite ghost image).

<sup>70</sup> About the distinction technology - cultural form, see Raymond Williams: *Television - Technology and Cultural Form*, Collins/Fontana, 1974. Later, the common practice of listening to the radio with earphones during the early days of radio broadcasting may have provided a more complete immersion and simultaneously a seclusion from the social life around. Yet there were different varieties even in this mode of listenership - a boy might listen alone in the attic, while families also listened together, each wearing one's own headsets. The popularization of loudspeakers seems to represent a turn towards the social definition of radio: the program created an auditive "wallpaper" that one could escape by leaving the house, or wearing earplugs!

<sup>71</sup> This sense of using the word 'topos' has been adopted from Ernst Robert Curtius, see my "From Kaleidoscomaniac to Cybernerd. Notes Towards an Archeology of the Media", in *Electronic Culture. Technology and Visual Representation*, edited by Timothy Druckrey, New York: Aperture 1996, pp. 296-303, 425-427. Actually, there is one single exception: a French stereograph depicting a crowd of people peering into a row of peepshow machines (Tirage Verneuil, 1868). See Denis Pellerin: *Le photographie stéréoscopique sous le second Empire*, Paris: Bibliothèque nationale de France, 1995, p.99. The stereograph has been erroneously titled as "La baraque des stéréoscopes". All machines seen in the picture only have one large peeping lens - perhaps this is a photograph of a Cosmorama show.

reality. A sign of the times, in the late 19th century the source of the problem is no longer a cunning military officer seducing someone's daughter, but a travelling merchant of mass-produced illusions.<sup>72</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>73</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 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>74</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 "television" apparatus in the late 19th century, the stereoscope was one of the models they turned to.<sup>75</sup> In imagination, the stereoscope was simply "wired" and electrified to provide a kind of "tele-peepshow" to communicate at a distance.<sup>76</sup> In the late 1910s a

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<sup>72</sup> This method was widely used to sell stereocards in the rural areas of the United States by major companies like Underwood & Underwood and Keystone. The sellers were often young men, who had been given the rights to sell in given territories. Detailed instructions about appropriate strategies were provided by the companies.

<sup>73</sup> Jonathan Crary: *Techniques of the Observer. On Vision and Modernity in the Nineteenth Century*, Cambridge, Mass.: The MIT Press (an October Book), 1991.

<sup>74</sup> 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 Denis Pellerin: *Le photographie stéréoscopique sous le second Empire*, Paris: Bibliothèque nationale de France, 1995, p.84.

<sup>75</sup> 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.

<sup>76</sup> An illustration (probably French), visualizing this idea, said to be from 1890, has been reproduced, with no source mentioned, in Albert Kloss, *Von der Electricität zur Elektrizität*, Basel: Birkhäuser Verlag,

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 as if 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>77</sup> 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>78</sup> In retrospect 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.

### 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 to 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 circa 50 cm high and up to 42 metres long) in the late 18th century are another example.<sup>79</sup> These devices were popular among the French aristocracy for a while, but they were 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

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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.

<sup>77</sup> Card in the author's collection. 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, have 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.

<sup>78</sup> See Hugo Gernsback: "Radio in the Future", *Radio-Craft*, March 1938, p.591. A magazine article from 1938 about a "television monocle" has been reprinted in facsimile in *Classic TVs. Pre-War thru 1950s*, Edited by Scott Wood, Gas City, In.: L-W. Book Sales, 1997 (II printing), p.3.

<sup>79</sup> Carmontelle was a garden designer, painter, playwright and entertainer of the aristocracy. About his transparencies, see Birgit Verwiebe: *Lichtspiele. Vom Mondscheintransparent zum Diorama*, Stuttgart: Füsslin Verlag, 1997, 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 Barbara Maria Stafford and Francis Terpak: *Devices of Wonder. From the World in a Box to Images on a Screen*, Los Angeles: Getty Research Institute, 2001, 330.

was visible through a square “stage opening”. To secure backlighting, the box was placed against a window (the rest of the window was covered by dark cloth). In the 19th century, a similar apparatus appeared again in the form of boxed miniature “moving panoramas”.<sup>80</sup>

The facts that Carmontelle often provided a narrative to accompany his images, and that the images were not a real-time transmission notwithstanding, the viewing situation evoked aspects that anticipated future forms of domestic spectatorship. At the Bibliothèque Nationale in Paris there is an extraordinary drawing by Carmontelle, showing in profile his employer, Louis-Philippe, Duc d'Orleans, and his son Louis-Philippe, Duc de Chartres sitting together and intensely staring at something (off the frame), most likely a presentation of the *Décors transparents*.<sup>81</sup> This drawing seems to hint at the emergence of a concentrated mode of domestic media consumption, theorized by Jonathan Crary.<sup>82</sup> This might be an early trace of a subject position in formation, one that later became an element of the television spectatorship. Rousseau's wish (discussed earlier) to use the peepshow box to immerse himself totally in the image excluding all distracting factors is related to the same issue, although it also raises the issue about the importance of the apparatus. Does the device need to be “immersive” to be able to give rise to an “immersive” experience? The intense concentration with which GameBoys and even cell phones are sometimes used in a noisy crowd seems to imply that this is not the case. Devices alone don't determine the ways they are used. A cell phone can quite a well be used in a distracted manner, the user being engaged in several different activities at once. The same is true of television. As we have seen, media consumption as a distracted social ritual was already present in the practices around the zograscope and the stereoscope.

A device that allowed a group of people to enjoy moving images together was the camera obscura. Since the Renaissance camera obscuras had been used as artists' tools, scientific demonstration devices and popular pastime.<sup>83</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

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<sup>80</sup> 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 my articles “Peristrepheic Pleasures: on The Origins of the Moving Panorama”, in *Allegories of Communication. Intermedial Concerns from Cinema to the Digital*, edited by Jan Olsson and John Fullerton, John Libbey/Indiana University Press (forthcoming) and “Global Glimpses for Local Realities: The Moving Panorama, a Forgotten Mass Medium of the 19th Century”, in *Art Inquiry (Poland)*, Volume IV (XIII), 2002. Special Issue on “Globalization in Art”, edited by Ryszard W. Kluszczynski.

<sup>81</sup> Original at the Bibliothèque nationale, Paris. It was shown at the Getty Center in Los Angeles as part of an exhibition on Carmontelle in the Spring 2000. Profile portraits were in vogue at the time, but usually there is no indication about what the posers are looking at.

<sup>82</sup> Jonathan Crary: *Suspensions of Perception. Attention, Spectacle, and Modern Culture*, Cambridge, Mass.: The MIT Press, 1999.

<sup>83</sup> The history of the device, and particularly the idea behind it, goes much further back in time. For a general history, see John Hammond: *The Camera Obscura. A Chronicle*, Bristol: Adam Hilger Ltd., 1981.

camera.<sup>84</sup> 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>85</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>86</sup> The principle of transmitting a live image in real time and presenting it on a dedicated surface for a group of spectators anticipates broadcast television. Phenomenologically, however, the situation also differs from the ritual of watching TV. We use the remote controller to switch the TV channel, but we don’t really 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>87</sup>

Small screen experiences were also anticipated discursively. In a well-known cartoon published in the *Punch Almanac* in England in 1879, we see an elderly couple sitting in front of a wide screen displayed above a fireplace.<sup>88</sup> The couple is observing a group of young people playing badminton, while having a telephone conversation with one of the ladies “through the wire”. This illustration has been interpreted as an early prophesy of the wall-mounted flat-panel television screens, but it gives us reasons for a deeper analysis as well. The device, “Edison’s Telephonoscope”, is identified by the image caption as “an electric camera-obscura” that the Pater- and Materfamilias “set up” every evening over their bedroom mantelpiece to communicate with their children who are “at the Antipodes” (in Ceylon).<sup>89</sup> Instead of being an “active screen”, the image is actually a projection created by an imaginary version of the camera

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<sup>84</sup> 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 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 screen in a camera obscura. For these definitions see *Oxford English Dictionary*, vol XIV, “screen”.

<sup>85</sup> Olafur Eliasson had constructed such a camera obscura as part of his installation at the Danish Pavillion, Venice Biennale 2003.

<sup>86</sup> This description is based on antique prints depicting people inside camera obscuras, but also on observing contemporary visitors’ behaviour at existing camera obscuras at San Francisco’s Cliff House and in Santa Monica, Los Angeles. A representative example can be found from F. Marion: *L’Optique*,

<sup>87</sup> 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.

<sup>88</sup> See for example Émmanuelle Toulet: *Cinématographe, invention du siècle*, Paris: Découvertes Gallimard & Réunion des musées nationaux, 1988.

<sup>89</sup> Still in 1889 Thomas A. Edison was claimed to have invented such a device which would “increase the range of vision by hundreds of miles, so that, for instance, a man in New York could see the features of his friend in Boston with as much ease as he could see the performance on the stage”. This was essentially the “Telephonoscope” envisioned by *Punch* ten years earlier. *Electrical Review*, May 25, 1889, p.6. Cit. Marvin, *When Old Technologies Were New*, p. 197. The fact that the communication takes place between England and Ceylon, brings the illustration within colonial ideology, which was intimately connected with the progress of international telegraphy.

obscura, appropriately set up in the darkness of the bedroom. The televisual potential of the camera obscura has thus been transformed by the imagination into a system of communication at a distance. As it often happens, the futuristic imaginary has found a “mould” from existing cultural forms. Of course, the cartoon must also have been influenced by the invention of the telephone a few years earlier (1876). Combining the camera obscura mode of transmitting images to the possibilities of the telephone has resulted in a vision of two-way multimedia communication.

As this example shows, 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>90</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 prophesies about tele-vision were 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>91</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>92</sup> These two models were not necessarily mutually exclusive, as is demonstrated by

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<sup>90</sup> The optical telegraph can be conceived as a combination of a semaphore-based signalling system and the telescope. For the debate around the optical telegraph, see Patrice Flichy, *Une histoire de la communication moderne. Espace public et vie privée*, Paris: Éditions de la Découverte, 1991.

<sup>91</sup> 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.

<sup>92</sup> 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.” (Michael Brian Schiffer, *The Portable Radio in American Life*, Tucson & London: The University of Arizona Press, 1991, p.12. About actual such systems in the late 19th century, see Carolyn Marvin, “Early uses of the Telephone”, *Communication in History*, edited by David Crowley and Paul Heyer, New York & London: Longman, 1991, pp.145-152.

Albert Robida's *Le vingtième siècle* (1883), a prophetic illustrated novel about the future society totally permeated by "telephonoscopic" communication.<sup>93</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>94</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 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 pavillion 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>95</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.

### 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>96</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

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<sup>93</sup> Albert Robida: *Le vingtième siècle*, Paris: G.Decaux, 1883 (Slatkine Reprints edition, Genève: Slatkine, 1981). In a silent science fiction film titled *High Treason*, directed by Maurice Elwey (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.

<sup>94</sup> Christophe Canto and Odile Faliu, *The History of the Future. Images of the 21st Century*, Paris: Flammarion, 1993, p. 32.

<sup>95</sup> Stephan Oettermann: *The Panorama. History of a Mass Medium* (translated by Deborah Lucas Schneider, New York: Zone Books, 1997, orig. 1980). I have adopted this definition in my own work on the moving panorama, "Global Glimpses for Local Realities: The Moving Panorama, a Forgotten Mass Medium of the 19th Century", in *Art Inquiry* (Poland), Volume IV (XIII), 2002. Special Issue on "Globalization in Art", edited by Ryszard W. Kluszczynski.

<sup>96</sup> The cultural meaning of round vs. quadrangular frames for displaying paintings and photographs is a very complex one, and cannot be dealt with here. For a useful general introduction to this problematic, see Jacques Aumont: *The Image*

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>97</sup> In the tradition of “natural magic” mirrors had often been proposed as 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 dream come true in your home...”<sup>98</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>99</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>100</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

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<sup>97</sup> See Jurgis Baltrusaitis: *Le miroir. Révélations, science-fiction et fallacies*, Paris: Elmayan/Le Seuil, 1978, pp. 184-187, 206-208. Reference to “téléviseur catoptrique” is on page 208. See also Sabine Melchior-Bonnet: *The Mirror. A History*, Translated by Katharine H. Jewett, New York and London: Routledge, 2002, pp. 108-110, 195- .

<sup>98</sup> For examples, see *TV Kultur. Fernsehen in der Bildenden Kunst seit 1879*, Herausgegeben von Wulf Herzogenrath, Thomas W. Gaehtgens, Sven Thomas und Peter Hoenisch, Amsterdam, Dresden: Verlag der Kunst, 1997, p. 146, 147, 157.

<sup>99</sup> 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.

<sup>100</sup> 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.

the 1930s and 40s, the upright floor-standing cabinet TV, contained the cathode ray tube in a vertical position, pointing upwards. One opened the horizontal 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 (analysed earlier). Can such parallels be coincidental? Do they imply some hidden “logic” controlling the evolution of cultural artefacts? 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>101</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>102</sup> One should not confuse television technology with its cultural form, to follow Raymond Williams’s useful distinction.<sup>103</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 remote controller in the 1950s.<sup>104</sup> The idea of close, tactile personal relationship with the screen was essential to “proto-interactive” TV

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<sup>101</sup> 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 effected the quality of the signal, not the content of the broadcast.

<sup>102</sup> 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.

<sup>103</sup> Raymond Williams: *Television - Technology and Cultural Form*, Collins/Fontana, 1974.

<sup>104</sup> 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.

programs like *Winky Dink and You*.<sup>105</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>106</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>107</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>108</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 loudspeaker.<sup>109</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

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<sup>105</sup> 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.

<sup>106</sup> 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’”, *Art@Science*, edited by Christa Sommerer and Laurent Mignonneau, Vienna-New York: Springer Verlag, 1998, 262-278.

<sup>107</sup> For visual anthologies of TV designs, see Phillip Collins: *The Golden Age of Televisions*, Los Angeles: W. Quay Hays, 1997; *Classic TVs. Pre-War thru 1950s*, Edited by Scott Wood, Gas City, In.: L-W. Book Sales, 1997 (II printing). These are invaluable sources for a design history of the TV set, rarely found in any academic libraries.

<sup>108</sup> 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 *Classic TVs. Pre-War thru 1950s*, op.cit., p. 73, 75.

<sup>109</sup> 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: *TV Kultur. Fernsehen in der Bildenden Kunst seit 1879*, op.cit., p. 154.

an important part of the TV programming, forcing the TV manufacturers to simulate the ratio of the cinema screen.<sup>110</sup>

As this article has shown, 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 “moulds” that will facilitate their cultural reception and evolution. Eventually these moulds 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 shadows) 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 unawares, 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>111</sup>

#### Conclusion: Towards an Archaeology of the Mobile Screen

This article has not been an exhaustive treatment of the history of the screen in all its manifestations. It has not even tried to say everything about the “small screen”. Its aim has been to excavate some important issues related to the cultural and historical understanding of what constitutes a screen as an information surface, and to hint at the wealth of material and approaches available for closer investigation. The appearance of the computer screen and its “archaeology”, for example, warrants a study of its own, extending the efforts already done by Lev Manovich.<sup>112</sup> The computer screen inherited some of the functions of the television screen, but it is also meant for the interactive manipulation of digital data. The user sits close to the screen, at tactile distance. This basic situation provides opportunities for multiple modalities of experience, from creating documents off-line to exploring graphic game worlds and browsing multimedia data on the Internet. Amidst all this variety, it might be suggested that particularly on-line browsing has re-activated certain aspects of the peepshow. Much of the World Wide Web is based on the logic of attraction. Flashing banners, slogans and logos try to persuade us to click, to enter a webpage and often to open tiny windows displaying moving images. The tempting invitations to open these tiny peepholes are most evident on the countless adult websites (often exploiting the voyeuristic possibilities of the webcam), but a similar logic permeates a wide range of seemingly different websites. The banners have taken the role of the showman, and the coin has been replaced by a credit card transaction.

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<sup>110</sup> 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.

<sup>111</sup> 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.

<sup>112</sup> See Manovich: *The Language of New Media*, op.cit.

Another aspect of the history of screens that has not been explored is the portable mobile screen, proliferating on cell phones, game consoles, PDA's and other platforms. These devices are often considered the newest of the new. They are seen as harbingers of totally unprecedented media cultural behaviors, phenomena and institutions. Is it possible to connect them with earlier developments? Should we admit that their proliferation signals a veritable cultural rupture, perhaps indicating the "end of media history"? Referring to decorated fans from the 18th and the 19th centuries as an answer will probably sound far-fetched. Yet from a media archaeological perspective such fans could indeed be considered a mobile and portable information channel, a medium. The production and variety of pictorial fans and hand-screens was enormous. While there were designs that imitated prints and mythological genre paintings, in the 19th century fans were often produced in connection with events like world's fairs, coronations or popular shows. Beside their practical function, and perhaps primarily, they functioned as souvenirs, advertisements and program booklets.<sup>113</sup> A particularly interesting variant of the hand-held fan was the "moving panorama hand-screen" that contained a small "stage opening", across which a long strip of images was wound from one roller to another. Illuminated from behind, the images became bright.<sup>114</sup> Such seemingly insignificant objects could function as portable information surfaces, even with moving images.<sup>115</sup> Of course, their possibilities were limited, with no communication capacities or changeable "software".

The invention of photography and the introduction of new printing techniques like the chromolithograph led to an amazing flood of images, many of them "pocket-size". Instead of being framed and hung on walls or stored in large and heavy albums, images became mobile. They traveled around with their owners, tucked in pockets or purses, enclosed in small cases or hidden inside jewelry.<sup>116</sup> Miniature viewers made it possible to view the portable images through mobile "prostheses". In the late 19th century, the idea of the mobile moving image appeared in the form of the flip book ("folioscope", "thumb movies", invented in 1860s). The flip book was immediately successful because it was small, cheap, easy to manufacture and distribute, "magical" as an experience, and precise in its reproduction of movement. It provided a "proto-interactive" hands-on experience, fit into the pocket, was disposable and did not

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<sup>113</sup> As in the case of Albert Smith's enormously popular moving panorama show *The Ascent of Mont Blanc* in the 1850s. For a recent study of Smith's career, see Mike Simkin: "Albert Smith: Entrepreneur and Showman", *Living Pictures*, vol 1, n:o 1 (2001), 18-28.

<sup>114</sup> This arrangement was derived from the large and bulky apparatus of the moving panorama show, but in lilliputhian form, displaced from its original context and re-placed in the hand.

<sup>115</sup> The thaumatrope, an optical toy invented in 1826, was also often used for advertising purposes. Spinning the simple round disc with illustration on both sides made these merge together. The illustrations could be replaced by a hidden text (a "brand name, for example) that only became visible when spinning the disc in one's hands (by means of two cords attached to the disc). In his *The Language of New Media* Lev Manovich quite embarrassingly presents a totally mistaken idea of the Thaumatrope. He claims that it produces a simple animation alternating between two images. Instead, the Thaumatrope merges the two images together, presenting an illusion of a static image! Also in other ways, Manovich's account of "pre-cinematic" technologies contains numerous misinterpretations, which he could have avoided by studying the most recent research on the subject. In this light claiming that magic lantern slides were made at least since the 1850s is ridiculous. We know from historical evidence that they existed at least since the second half of the 17th century.

<sup>116</sup> About the varieties of portable images in the 19th century, see Heinz K. Henisch and Bridget A. Henisch: *The Photographic Experience 1839-1914. Images and Attitudes*. University Park, Pennsylvania: The Pennsylvania University Press, 1993.

require any specific piece of hardware to be viewed. Since its introduction, it has been used for many purposes from personalized moving portraits (such as the British BioFix in the 1920s), short erotic treats, dancing lessons and piano teaching to animations for children, corporate gifts and animated advertisements. Although not strictly a screen-based device, the flip-book provides a challenging model for the designers of new mobile media.

Such examples can, at best, support the argument that cultural innovations are always relative. To understand the logic and possibilities of mobile visual media, one should look beyond the realm of the visual. The archaeology of mobile sound media provides a fruitful and necessary field of investigation. Contrary to a commonly held belief, the history of portable sound devices did not begin with the transistor radio. Even if we excluded the long and rich discursive history of imaginary mobile sound machines, we would still find a rich variety of devices spanning most of the 20th century.<sup>117</sup> Sometimes such devices, many of which are totally forgotten, combined multiple functions, anticipating multimedia. To understand the role and the functions of portable screens, we have to research where, how, and by whom they have been used. The modes of attention required by images and sounds are different. More research is needed about the issues of immersion in sounds vs. images. How does the experience of a Walkman user differ from that of a cell-phone user?<sup>118</sup> How does the mobility of the subject alter the experience? Obviously listening to sounds by headphones while walking differs from checking text-messages from the screen of the cell phone. The presence of miniature cameras in cell phones will theoretically complicate the situation further. As media archaeology demonstrates, to find answers to these and other questions, it is not enough to look for similarities from the rich . We need to identify points of divergence as well.

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<sup>117</sup> A very useful source is Michael Brian Schiffer, *The Portable Radio in American Life*, op.cit.

<sup>118</sup> For the cultural impact of the Walkman, see Shuhei Hosokawa: *Walkman-Effect*, Berlin: Merve-Verlag.