

Winkler, Hartmut: The Computer and the Audiovisual:  
Ruptures and Continuities in Media History.  
In: Emden, Christian J.; Rippl; Gabriele (Hg.):  
Image Scapes: . Bern 2010. S.215-244

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## The Computer and the Audiovisual: Ruptures and Continuities in Media History<sup>1</sup>

### Conceptual Problems

In a radical departure from visual forms of representation, a new means of representation appears with the machines of information. Its novelty has not yet become apparent, for it is difficult to conceptualize the difference between the synthetic images and other automatized images.<sup>2</sup>

One of the crucial questions regarding the digital universe is how it relates to already established media. From the moment the computer was recognized as a medium, a fervent debate has emerged about conceptual criteria and categories that seek to describe the computer's position within the history of media. The technical image has often been at the center of these debates. 150 years of photography, film and television seem to suggest that the terms 'media' and 'visuality' are virtually synonymous. Does the computer really mark a 'radical departure from visual forms of representation'? Or does it still generate synthetic images, which would erase any distinction? Don't photography and television already provide us with 'pixeled' images and,

<sup>1</sup> This article is a revised and abridged version of a chapter first published in Hartmut Winkler, *Docuverse: Zur Medientheorie der Computer*, Munich 1997. The original German text is available at: <http://www.boerverlag.de/winkler.htm>. Other English texts by the author can be found at: <http://www.uni-paderborn.de/~winkler>.

<sup>2</sup> Edmond Couchot, 'Die Spiele des Realen und des Virtuellen', in Florian Rötzer (ed.), *Digitaler Schein: Ästhetik der elektronischen Medien*, Frankfurt/M. 1991, p. 347.

therefore, digital representations?<sup>3</sup> Or are the notions of representation and reference relevant only in the field of technical images, while the new medium of the computer needs to be understood differently?<sup>4</sup>

During the 1980s, the confusion has been further exacerbated by the inflationary excitement about computer art. Large annual events like the *Ars Electronica* in Linz, Austria – documented on public television, and discussed in journals and theoretical pamphlets – have left the impression that, after a prehistory of abstract algorithms and a first attempt at ‘computer art’ during the 1960s, digital media finally reached a state of sensual perceptibility. Thanks to superior hardware it seemed possible to control the exorbitant amounts of data required for graphic representation, thus competing with the high resolution of the photographic image. Film and television increasingly introduced digital forms of post-production and editing, while the aesthetics of advertisement began to amalgamate real and synthetic images.

Databases for images exist online since about 1993, and various web browsers offer many options for visual representations, while even websites that offer little actual information operate with a rich graphic interface. The sheer amount of visual data are one of the main reasons why broadband internet connections have been such a marketing success. Interactive forms of television and multi-media interfaces seem to be the endpoint of the ‘information highway.’

Against this background, it seems as though digital media have increasingly become visual. But what if this should only be an optical illusion?

3 This is the position of Vilém Flusser. See *Für eine Philosophie der Photographie*, Göttingen 1983, pp. 28–29, and *Ins Universum der technischen Bilder*, Göttingen 1985, pp. 17ff.

4 Among many examples, see Wolfgang Hagen, ‘Die verlorene Schrift: Skizzen zu einer Theorie der Computer’, in Friedrich A. Kittler and Georg Christoph Tholen (eds.), *Arsenale der Seele: Literatur- und Medienanalyse seit 1870*, Munich 1989, pp. 220, 224, and 226; Norbert Bolz, ‘Computer als Medium – Einleitung’, in: Norbert Bolz, Friedrich A. Kittler, and Georg Christoph Tholen (eds.), *Computer als Medium*, Munich 1994, p. 10; Frieder Nake, ‘Künstliche Kunst: In der Welt der Berechenbarkeit’, *Kunstforum International* 98 (1989), p. 86.

What if this merely constitutes a transitional phase, a kind of historical compromise that the computer offers to a public accustomed to visual representation? Perhaps this compromise will break down as soon as the balance of power shifts to the digital machine? The visual interface of the computer would, then, merely be a fake screen behind which the real changes in the logistics of perception take place. This is, indeed, the thesis that I shall submit in this article: at present we are able to observe a fundamental shift in the history of media, from a world of technologically generated images to a completely different and more abstract constellation of media. This, it seems, also leads to a decisive crisis of technical images and a deep rupture in the history of media<sup>5</sup> – a new game has started and a new, fascinating world is opening up.

Nevertheless, some preliminary theoretical remarks might be useful. First of all, the argument outlined above depends on our understanding of media history. It is fundamentally different if we distinguish the ‘electronic age’ – television and computer –, from traditional notions of literacy, as did Marshall McLuhan, or if we suggest, like Friedrich Kittler, that the actual break leads from natural language to the immediate recording of reality.<sup>6</sup> Furthermore, we can argue, like McLuhan, that the ocularcentric world of visual perception begins in writing and ends in the medium of television or we can claim, as Vilém Flusser did, that two-dimensional images and linear writing culminate in zero-dimensional algorithms.<sup>7</sup>

Beneath these different ways of thinking we are also faced with a more general problem: Is it even reasonable to assume that there is a succession of different media? Is it really the case that, for instance, television

5 I have discussed this in more detail in ‘Das Ende der Bilder? Das Leitmedium Fernsehen zeigt deutliche Symptome der Ermüdung’, in: Knut Hickethier and Irmela Schneider (eds.), *Fernsehtheorien: Dokumentation der GFF-Tagung 1990*, Berlin 1992, pp. 228–35, and ‘Tearful Reunion auf dem Terrain der Kunst? Der Film und die digitalen Bilder’, in Joachim Paech (ed.), *Film, Fernsehen, Video und die Künste: Strategien der Intermedialität*, Stuttgart 1994, pp. 297–307.

6 Friedrich A. Kittler, *Discourse Networks, 1800/1900*, trans. Michael Metteer and Chris Cullens, Stanford, CA 1990.

7 Flusser, *Ins Universum der technischen Bilder*, pp. 10ff.

accessed without any prior technical knowledge, the lack of which always leads to considerable frustration? Taking into account that the success of visual culture was dependent on its sensual qualities, the computer should, historically speaking, not be a successful medium at all. Either the criteria with which we measure the success of visual culture cannot be applied to the computer, or these criteria have already failed to explain the old, visual, media constellation.

It seems, then, that a double approach is necessary. On the one hand, we will need to ask which differences, and which promises, caused users to switch to another medium. On the other, we will need to examine which mechanisms remain constant despite the seeming differences between the media constellations involved. After all, since the needs of a society do not change abruptly, certain social needs will remain constant and will be served by both new and old media. As a consequence, there will also be a set of characteristics that connect both of them, even though they might be fundamentally different on the surface. Needless to say, these characteristics cannot be those that have traditionally been seen as pertaining to the technical images of modern visual culture. We will, thus, need to introduce new criteria that allow us to conceptualize the historical shift, and we will need to develop these criteria in relation to the models suggested by other theorists. Such an approach will inevitably have certain limitations. To compare different media, and to argue in the uncertain space in between different media, is a more difficult undertaking than to describe media from the point of view of their internal logic. The kind of media theory suggested here can only deliver a certain perspective on the developments at hand; only if we are aware of these limitations does this undertaking make any sense at all.

## A Crisis of Images?

The optical image only provides us with a momentary, finite reality that is quite literally crystallized in the grains of the film or in the direction of the magnetic particles on the electromagnetic tape. The concept of re-presentation, which makes something that is absent present in the image, aptly expresses the mode of representation that comes with this technology. [...] The synthetic image [in contrast] does not represent reality, but rather simulates it. It does not leave an optical trace and does not record something that has existed but does not exist anymore; rather, it generates a logical-mathematical model, which describes less the phenomenal aspect of the real than the laws that govern the real. What precedes the images is not the object (the things, the world ...) or any finite reality, but the apparently incomplete and approximate model of the real, that is, its formal description on a purely symbolic level. [...] The new image no longer provides evidence of reality by a momentary inscription of light, but it substantiates an interpretation of the real, which has emerged with, and is filtered by, language.<sup>9</sup>

Edmond Couchot's statement highlights the differences that are at stake. Photography was based on surfaces that reflected light and, breaking with a metaphysical tradition that always distrusted appearances, it moved the phenomenal dimension of reality into the center of its system of representation. Its background was an apparatus that safeguarded the relationship between the representation and that which was represented; its emphasis on a clear, iconic relationship between signs stood in direct opposition to other systems of representation that were essentially arbitrary. Realism and reference were the foundation on which the system of technical images was able to grow and which also allowed for the unfolding of its other dimension, that is, of fiction, magic and the phantastic.

The new synthetic images cancel out this order of representation. Leaving the surface behind, their attention is focused on those structures, which first of all generate surfaces; it is focused on the level of programming, of formalized descriptions and models, which Couchot – this is important

9 Couchot, 'Die Spiele des Realen', pp. 347–48.

– relates to language. Their character as images is, in a certain sense, peripheral. For these models to function it is almost irrelevant if they lead to images or to other kinds of representation. Iconicity loses its privilege, while symbolic mediation, it seems, remains intact. It is also important to realize that Couchot does not deny the referential quality of these images, for even the most arbitrary system of representation remains indebted to notions of reference. But again we face the question: How could such a difference emerge? Have technical images reached their limitations?

Any reasonable answer to this question, it seems to me, will need to start out from the observation that, instead of external reasons, it is primarily the changes in the universe of the images themselves, which are responsible for the difference at stake. The emergence of a universe of images reacted, above all, to a specific historical problem, that is, it reacted to the crisis of natural language and of writing. If this historical trajectory also begins to supersede technical images, we may assume that the world of technical images itself is facing a similar crisis. The internal contradictions within visual culture, in other words, have gained a historical momentum and find their solution in the current shifts within the history of media.

## The Crisis of Language around 1900

The so-called ‘crisis of language’ between 1850 and 1918 serves as an excellent model for the current situation, since there is wide agreement in literary studies and beyond that this crisis did in fact take place. This agreement is independent of the model we apply to the history of media. But how could such a powerful medium as natural language enter a state of crisis?

Literary historians firstly refer to a series of changes that took place within the literary field and that can be reduced to well-known commonplaces of modern literature. Rolf Grimminger,<sup>10</sup> for instance, highlighted

<sup>10</sup> Rolf Grimminger, ‘Der Sturz der alten Ideale. Sprachkrise und Sprachkritik um die Jahrhundertwende’, in *Funkkolleg Literarische Moderne: Studienbrief 3*, Tübingen 1993, pp. 4–31.

that, in the course of the nineteenth century, literary texts emphasized their contrast to natural language. Increasingly questioned as a transparent means of representation, language was seen as an institution against which literary authors had to direct their own writing in order to establish their cultural practice;<sup>11</sup> language was increasingly seen as a system of conventions and social demands, whose experience was thematized in the literary texts themselves. The background was the highly regulated language of the nineteenth century, reflecting a certain concept of education.

Inextricably linked to the normative conventions and regulations of a repressive society, language primarily seemed to be a system of exclusion. Wide areas of individual experience, but also the new scientific world-view and technology itself, which increasingly permeated everyday life, fell outside the boundaries of these normative regulations. This was, however, exactly where new literary developments began to materialize. The work of literary authors as different as Arthur Schnitzler, Karl Kraus, Hugo von Hofmannsthal and Rainer Maria Rilke, Grimminger argues, was marked by the attempt to give a voice to what had been excluded from language. From Friedrich Nietzsche’s critique of language to Sigmund Freud, and from naturalism to the projects of the avant-garde, which attacked grammar and semantics in order to reach the essence of language itself, we can observe that what was traditionally seen as being beyond language gained the upper hand. The realm of cognition became marginalized, while a somatic element began to structure writing. The role of natural language itself became increasingly precarious within the context of these developments.

The space that technical media would soon occupy seemed to unfold almost automatically. If the evolution of media produced photographic images, if opera generated the *Gesamtkunstwerk* only to be replaced by cinema, it seemed only natural that these developments began to leave behind language as a whole – technical media are not based on conventions in the same way as language undoubtedly is. The technical ‘recording of

<sup>11</sup> This was later to become the basis of Julia Kristeva’s *Revolution in Poetic Language*, trans. Margaret Waller, New York 1984.

reality' ('Realaufzeichnung')<sup>12</sup> removes the need for linguistic description and allows for a compromise with those areas of experience that traditionally fell outside the realm of natural language.

This is, in short, the standard narrative adopted by a literary history that takes the evolution of media seriously. As concise as this narrative might be, it also carries a certain amount of irritation: from our current perspective, for instance, these developments can only be thought of as irreversible. How should the skepticism about conventions ever be overcome? It seems unlikely that the evolution of media will return, in one way or another, to natural language – or to a system of representation along the lines of natural language. And if the computer and the conditions of information technology cannot be explained within the historical logic of this standard narrative, since they are inherently dependent on symbolic language and conventions, the model suggested within the field of literary studies becomes highly questionable.

In contrast to this standard narrative, I should like to propose a different interpretation, which takes up some of the developments sketched out above, while modifying our understanding of the 'crisis of language.' Above all, it will be inevitable to attempt a more coherent understanding of convention. The lack of confidence in language is not the cause of the developments at hand, but merely an effect triggered by a changed discursive structure. Furthermore, from this perspective it will become obvious that the basic problem generated by the 'crisis of language' continues to haunt our present situation. The evolution of modern media seeks to come to terms with the problems generated by the 'crisis of language' in the second half of the nineteenth century. The various technological responses to these problems are as different as the problem – passed on from one medium to another – remains constant.

There is one text that leads us straight into the 'crisis of language' around 1900: Hofmannsthal's 'Letter of Lord Chandos', published in

12 This is the concept with which Friedrich A. Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz, Stanford, CA 1999, describes the logic of both gramophone and film.

1902.<sup>13</sup> Fictitiously dated back to 1603, this text first of all describes the experience of a personal crisis: Lord Chandos suffers from a breakdown of his ability to speak. Written retrospectively from the view-point of convalescence, the crisis lives on in the language of the fictitious letter. While the text itself can be interpreted from a variety of different perspectives, the crisis of general concepts that marks the author's experience is particularly interesting for our purpose. The erosion of language does not begin with grammatical structures, with the formal side of language or its semantic units in general, but it begins, first of all, with concepts such as 'mind,' 'soul' or 'body.' As a consequence, Chandos, as he is commonly quoted, reports that he has difficulties especially with 'complex and general topics.' What, then, does it mean for Chandos if abstract concepts 'dissolve on his tongue like decomposing mushrooms'?

Assuming that the semantic system of natural language operates with hierarchies, abstract concepts need to be located at a relatively high level within this hierarchy; removed from concrete experience, they are nevertheless central to any language. Furthermore, at least until the eighteenth century, the semantic system of natural language was indeed conceptualized in the form of a pyramid: the concept of 'God' at the top of this hierarchy served as an organizing center that incorporated all other linguistic determinations. Ideally, everything could be deduced from, and was dependent on, this most abstract concept of 'God', which first and foremost safeguarded the order of the system as a whole.<sup>14</sup> The 'death of God' during the eighteenth century also removed the rigid hierarchy of the pyramid; old hierarchies dissolved into a more complex system of order. While natural language remained structured according to hierarchical relations, its center was left empty. Natural language, in other words, became

13 Hugo von Hofmannsthal, 'Ein Brief', in *Gesammelte Werke in Einzelausgaben*, X (*Prosa*, 2), Frankfurt/M. 1951, pp. 7–22.

14 For a detailed reconstruction of this background, see Lina Bolzoni, 'The Play of Images: The Art of Memory from its Origins to the Seventeenth Century', in Pietro Corsi (ed.), *The Enchanted Loom: Chapters in the History of Neuroscience*, Oxford 1991, pp. 16–65. Bolzoni refers back to medieval images that represent the figure of Jesus in the center of tree-like, hierarchical semantic models.

a polycentric system – even though the fundamental problems resulting from this situation were recognized relatively late and, until the nineteenth century, were predominantly dealt with in philosophy. It is precisely this erosion of traditional hierarchies which is responsible for Lord Chandos's failure to use general concepts.

But what is the result of this erosion? Is it possible to move to a language that is exclusively dominated by concrete references and therefore devoid of any abstract concepts? Hofmannsthal at least alludes to such a possibility and it is important to understand that he presents the crisis of language as an experience of disintegration. Starting out from a pre-established unity, his protagonist experiences an apocalyptic decay, which indeed destroys all prior knowledge and declares virtually all previous semantic categories null and void. In the end, there is no return to conceptual unity, but a kind of semiotic hovering:

Since this time I lead an existence, which, I fear, you will barely be able to understand, as dispirited and thoughtless as it is; an existence that is, of course, hardly different from that of my neighbors, my relatives and most of the land-owning gentry of this kingdom, and that is not completely without happy and enlivening moments. It is not easy for me to tell you what constitutes these good moments; the words, once again, desert me. For it is something entirely unsayable, something that perhaps cannot be expressed at all, which in such moments announces itself to me, filling everything in my daily environment like a container with an overflowing flood of a higher life. I cannot expect that you understand me without providing you with an example, and I have to ask you for patience with regard to my ridiculous examples. A watering can, a harrow, which has been left on the fields, a dog in the sun, a poor churchyard, a cripple, a small farm house – all this can become a container for my revelations. Each one of these objects, and a thousand similar ones, over which our eyes normally glide with a habitual disinterestedness, can suddenly, in a moment, which I cannot voluntarily control, take on a sublime and touching air, which language seems to be too poor to express adequately. [...] I sense an exciting, plainly endless play of contradictions in me and around myself, and there is no matter into which I cannot flow. [...] And the whole is a kind of feverish thinking, but a thinking that takes place in a matter more immediate, more fluid, more glowing than words, [...] for the language, in which I might be able not only to write, but also to think, is neither English, nor Italian, nor Spanish, but a language of which no word is known to me, a language in which the silent things speak to me.<sup>15</sup>

15 Hofmannsthal, 'Ein Brief', pp. 15–22.

The protagonist retreats into a terrain beyond the social norms of language. The language of things has replaced the language of words; an aesthetic experience, with a clear emphasis on the visual, has replaced the destroyed words. As such, it is of little surprise that Hofmannsthal, barely twenty years later, in 1921, also composed a fascinating text about the cinema.<sup>16</sup>

The development sketched out in the 'Chandos Letter' ultimately has to transcend language, for any radically concrete reference is impossible within natural language. But since every abstract concept stands in relation to more concrete concepts, and since even concrete concepts can be dissolved into ever more concrete characteristics, there cannot be any concrete concepts *as such* – abstraction is always already part of language. If language is marked by a mechanism that cumulatively generates signifieds from chains of signifiers, or discursive events, and if this needs to be regarded as the foundation for linguistic abstraction, we also need to assume that all general concepts can be ordered according to their universality.

The crisis of language, then, attacks language from the side of its signifieds. Or, in other words: the dissolution of abstract concepts into their constituent parts hints at a disturbance within the mechanism that generates signifieds in the first place. The transition from a 'discourse' into a 'system', which is normally part and parcel of every linguistic process, does not proceed unconsciously anymore, 'silently', without resistance. Instead of normative conventions being in crisis, the signifieds are in a critical state. Frighteningly, the crisis of language moves from the level of social conventions to the realm of the semiotic itself.

Whether such a semiotic, or technical, interpretation is of any explanatory value becomes clearer once we consider possible reasons for the shifts and ruptures within the history of media. However, the question we have to deal with is itself already moving into a different direction: While the assumption that trust in natural language is suddenly shattered is primarily based on the idea of a break within the history of ideas, we now have to con-

16 Hugo von Hofmannsthal, 'Der Ersatz für die Träume', in Anton Kaes (ed.), *Kino-Debatte: Texte zum Verhältnis von Literatur und Film, 1909–1929*. Munich 1978, pp. 149–52.

sider factors that might be external to the history of ideas, but nevertheless affect processes of signification. Yet what could such factors be?

Returning, if only for a moment, to the 'Chandos Letter', we find that the text is marked by an uncanny anxiety related to the social character of natural language:

I found it impossible to come to any judgment about courtly matters, about occurrences in parliament, or about anything else. [...] It happened to me that I wished to address a childish lie my four-year old daughter Katharina Pompilia was guilty of, and that I wished her to realize the need to always speak the truth; but the concepts that streamed into my mouth suddenly took on such a glimmering color, flowing into one another, so that I only mumbled my sentence as well as I could and slammed the door behind me as though I suddenly had become unwell, and I really became pale in the face and felt a strong pressure on my forehead, leaving the child behind only to recover myself on horseback, galloping across a deserted pasture.

Increasingly, however, this problem became worse like rust corroding everything round it. Even in the most personal and profane conversations pertaining to family matters, the judgments that one normally gives easily and without much reflection like a sleepwalker became so questionable that I had to cease taking part in such conversations. I became filled with an inexplicable anger, which I could hide only with great difficulties, when I heard statements such as: this or that turned out well or badly for someone; Sheriff N. is an evil person and preacher T. is a good person; tenant M. needs to be pitied, because his sons are squanderers; another we have to envy, because his daughters are thrifty; one family is winning, another is losing its status. All this seemed to me impossible to prove, deceiving and full of holes. My mind forced me to superimpose all topics raised in such conversations: in the same way in which I once gazed through a magnifying glass at part of my little finger's skin, which resembled a heath with channels and caves, I now experienced people and their actions. I was no longer successful in looking at them with the gaze of custom. Everything dissolved into parts, and the parts into further parts, and nothing could be encompassed by a concept [*Begriff*].<sup>17</sup>

The layer of social customs has hitherto camouflaged what now becomes apparent with terrifying clarity: language rests on a social contract and, permeated by value judgments, does not aim at knowledge and truth, but at establishing social consensus. Of course, this idea, and the polarity of

17 Hofmannsthal, 'Ein Brief', pp. 12–14.

truth and lying, connects this passage to Nietzsche's critique of language.<sup>18</sup> Adhering to the truth, the latter remarked, essentially means 'to employ conventional metaphors' and 'to lie en masse in a way that is binding for everyone.'<sup>19</sup> The entire set of concepts – with its pyramidal order, its norms, privileges, hierarchies and boundaries – is rooted in a fragile foundation; its internal rigidity merely constitutes a defense mechanism. Emerging from social practices, language is 'anthropomorphic through and through', despite its claim to truth.<sup>20</sup> In a sense, then, this is the other side of our concept of 'convention': the irreducibly arbitrary nature of language. Of course, within the tradition of philosophical thought this is far from new. But Nietzsche's realization that such arbitrariness is, in fact, frightening suggests that something happened to the object of language itself. But what could this be? How is it possible that language, in its entirety, was suddenly seen as a 'lie'?

### The Crisis of Language: The 'Theory of Two Minds'

My answer to the above question starts out from the idea of social mediation. This makes it necessary to change our perspective once more, this time toward a sociological, that is, functional interpretation. Language, needless to say, is always intersubjective. What is variable, however, is the social and, by implication, semantic space of language. This might be precisely where we can find the key to the crisis of language as well as to the evolution of media. The concept of social differentiation, as it was developed by Peter M. Hejl against the background of Niklas Luhmann's work, stands at the

18 Friedrich Nietzsche, 'Über Wahrheit und Lüge im außermoralischen Sinne', in *Werke*, V, Munich 1980, pp. 309–22.

19 *Ibid.*, p. 314.

20 *Ibid.*, p. 316.

center of my argument.<sup>21</sup> Hejl clearly shows that social differentiation always culminates in a disunity of epistemic fields, that is, a disunity of our available knowledge. From this perspective a successful model for the internal logic of the history of media can be developed, which might be somewhat rough and socio-economic in orientation, but which aptly describes the very problem at hand.

Based on both Luhmann and Hejl we can stipulate that the division of labor stands at the very center of the processes of social differentiation.<sup>22</sup> Hejl distinguishes between two different historical types of social organization. The first would be a social system with little internal differentiation, as in the case of tribal or agrarian societies. Any society whose members are predominantly concerned with procuring food depends on the fact that the basic qualifications among its members are highly redundant. This redundancy is generated and stabilized by means of an oral tradition as well as by inscribing the practical use of tools unto the body itself. Mythical and religious systems allow for a coherent world view, while the limited geographic expansion of such societies allows the exclusion of anything that lies beyond their horizon as irrelevant. Of course, in reality there has probably never been a society which was able to operate without social differentiation, such as the division of labor between the sexes, and whose horizon was not perforated by cultural differences,

21 Peter M. Hejl, 'Wie Gesellschaften Erfahrungen machen oder was Gesellschaftstheorie zum Verständnis des Gedächtnisproblems beitragen kann', in Siegfried J. Schmidt (ed.), *Gedächtnis: Probleme und Perspektiven der interdisziplinären Gedächtnisforschung*, Frankfurt/M. 1991, pp. 293–336.

22 For Hejl, the division of labor represents what Luhmann described as the internal differentiation of social systems, even though Luhmann's theory operates on a more general level. See Niklas Luhmann, 'Veränderungen im System gesellschaftlicher Kommunikation und die Massenmedien', in Oskar Schatz (ed.), *Die elektronische Revolution: Wie gefährlich sind die Massenmedien?*, Graz 1985, pp. 13ff; *Soziale Systeme: Grundriß einer allgemeinen Theorie*, Frankfurt/M. 1987, p. 22; 'Einführende Bemerkungen zu einer Theorie symbolisch generalisierter Kommunikationsmedien', in *Soziologische Aufklärung*, II, Opladen 1975, pp. 170ff. However, within the context of the above argument, the notion of a division of labor avoids the high level of abstraction that marks Luhmann's approach.

wars, travel and trade. But what Hejl wishes to emphasize with his notion of 'communities' is the relative autonomy of social systems with regional boundaries, whose life cycle neither depends on external relations nor on internal differentiation.

Within such social systems, the lack of internal complexity obstructs certain evolutionary developments, especially since the cultural memory of their members is limited. This is, however, exactly where the second type of social organization begins. In order to overcome such limitations, labor, as well as the mental and physical knowledge required to carry out labor, are divided among the members of the social system. This certainly gives way to a sudden rise in social complexity, to the development of increasingly specific technologies and, consequently, to a regional specialization of production, which culminates in an international and, nowadays, global division of labor.

As far as 'information processing' on a social level is concerned, this development eliminates redundancy. It is not necessary to reproduce the knowledge required for economic production in a redundant way among all members of a society. Those not directly affected by a specific kind of knowledge can turn their attention elsewhere. This, of course, generates serious problems. On the one hand, social processes need to relate different forms of expertise and practice in a sensible and meaningful way. Elaborate mechanisms are necessary for internal organization and for the social mediation of knowledge through the 'market' and similar institutions.

On the other hand, such an 'objective' socialization cannot solve all problems on its own. Complex divisions of labor require an almost infinite number of communication processes, which are in turn initiated by the division of labor. For Luhmann and Hejl, this is precisely the systematic space inhabited by media: communication takes place in order to relate different kinds of knowledge and fields of expertise to one another. Division of labor and communication through media are systematically and complementarily interdependent. Communication, above all, interrelates what has been separated by the division of labor, with regard to its content, its functions, but also its geographic implications. As such, we can observe a direct relation between the amount of social differentiation and the social need for communication. Ironically, when the first American

coast-to-coast telegraph cable was introduced, there was a general doubt that the geographically separated communities had anything to say to each other. Nevertheless, communication is not a luxury item.

This leads us to a second observation, which, as I should note, goes beyond Luhmann's and Hejl's model and which I should like to term, not without self-irony, the 'theory of two minds.' In a certain sense, the evolution sketched out above also causes a significant split within individuals. We might even say that, instead of one mind, the members of complex societies need two minds – one 'working mind' concerned with a specific practical expertise that ideally differentiates this individual from other individuals, and a more general mind that allows for being 'human' and thus for the ability to communicate. The function of this 'second mind' is to sustain those areas of knowledge that remain highly redundant and that are required for each member of a society. That there is an increasing gap between the two 'minds' describes the tension which needs to be discussed subsequently. Of course, this tension is hardly new. Already eighteenth-century institutions like the bourgeois salon or the emerging public sphere of civil society highlight how difficult it has always been to mediate between these 'two minds' and to achieve, as Jürgen Habermas has noted, an 'uncoerced rational consent' through social reasoning, which seeks to compensate for the increasing disunity of world views.<sup>23</sup>

The general problem, then, is the following: the specialization of the 'working minds' always leads to a specialization of world views. Every attempt to establish a public sphere, to provide social cohesion and communication, thus, needs to develop a centripetal force that is able to balance the centrifugal pressures of social differentiation. In turn, social differentiation can only develop as long as the coherence of communication is still guaranteed. With increasing differentiation, natural language comes under pressure: as an institution that takes part in the process of sociation, language needs to reunify, as it were, the diverging specialized idioms and

23 See Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, trans. Thomas Burger and Frederick Lawrence, Cambridge 1989.

language games – it needs to refer them back to a language *in the singular* that is shared by most members of the social system and it needs to cancel out the developing tensions within its internal structure.

To put it more clearly, language needs to provide an exponentially growing number of ways of speaking for everything that is the case, or for all entities generated by a dynamic economic and scientific practice.<sup>24</sup> But at the same time language also needs to provide a set of trustworthy categories and general concepts able to unite the majority of its users in social consensus. Of course, from a structural point of view this task might be self-contradictory. Every new form of knowledge and every new practice that does not lead to one of the very rare forms of synthesis<sup>25</sup> forms a new microcosm and enforces a further differentiation of language. But increasing linguistic differentiation also contradicts the relatively limited capacities of language users, for the set of intersubjectively shared categories and concepts cannot be extended in the same way. Sooner or later, a crisis will affect the very center of language. Abstract concepts become more and more relativized and are unable to bridge highly differentiated forms of usage – they become ambiguous in a destructive way.

Seen against this background, the crisis of language reveals itself as a crisis of signification: if that which is signified in language is seen as a 'lie,' we experience a differentiation that detaches our world views from linguistic conventions. Our speaking, as endangered as it already is, becomes a speaking against language. There is, in other words, a discursive practice that provides a space within which both language and the failure of language can be negotiated. Between 1850 and 1918, however, this discursive practice left behind the terrain of natural language.

24 The multiplicity of ways of speaking is particularly obvious in areas such as chemistry, jurisprudence and sociology, but also with regard to technological terminologies. See Wolfgang Hagen, 'Die verlorene Schrift: Skizzen zu einer Theorie der Computer', in Kitler and Tholen (eds.), *Arsenale der Seele*, p. 224: 'Even the smallest parts of a modern car, for instance, have specific names that overwhelm the layperson when the mechanic begins to dismantle a differential gear.'

25  $E=mc^2$  is one of the syntheses that have not occurred on the level of language.

## Technical Images

The entire evolution of media, I would like to suggest, can be understood as a series of attempts to come to terms with the problem outlined above. This becomes especially obvious with regard to so-called 'technical images.' Around 1900, photography and film were enthusiastically embraced as a redemption from language. Photography and film are able to transform into a cultural practice what in Hofmannsthal's 'Chandos Letter' remained a numinous aesthetic experience: photography and film are indeed a radical language, articulating themselves in concreteness. They set the particular against the universal, whose value is increasingly doubted; they contrast the unity of general concepts with a multiplicity of concrete examples. The concept 'table', for instance, can be dissolved into the plurality of all the tables that can be photographed, which means that abstraction as well as the generation of signifieds can be avoided. Technical images are able to operate without any reference to the organized system required by natural language. They are able to counter the conventionalized norms of natural language with a more open structure. This structure might not be entirely devoid of rules and norms, but these do not support the system of representation as a whole and are not dependent on the establishment of a social consensus.

'Openness' fundamentally belongs to the promise of technical images. Wherever language seems dependent on conventionalized meaning, images can offer a multiplicity of meanings. Perception and interpretation do not necessarily converge, which allows for ambiguities that are not regarded as destructive in any way, but rather as the very basis of representation. Convention and consensus cannot be seen as the primary premises for communication; they are merely its possible result. When Christian Metz, for instance, defined film as a 'speaking without language', this was – beyond the semiotics of cinema – the most concise formulation of the utopia with which film countered language, negating its systematic character.<sup>26</sup> Speak-

26 Christian Metz, *Semiotique des Films*, trans. Renate Koch, Munich 1972, pp. 51ff.

ing without language would be a manner of speaking that does not need to direct itself against language, but merely against writing; it can happily shift its attention from a past that is condensed in codes to an open future.

But, if social differentiation and the division of labor have threatened the coherence of language and its signifieds, what could possibly be gained from a system that does not even provide central signifieds? Technical images generate coherence in an entirely different way. Against the background of the 'theory of two minds', we can deduce that technical images do not invest equally in all semantic fields, but that they are almost exclusively concerned with the second, the 'human' and the 'general mind.' The project that photography, film and television pursue is to strengthen this 'second mind', equipping it with world views that are able to counter the dangers of fragmentation in the most efficient way. In contrast to their general claim to represent the totality of the social world, visual media have focused on a relatively limited range of objects: people, love, crime, and politics. The very fact that visual media are often seen as predominantly entertaining is further evidence for their close relationship to the 'second mind', especially if we understand the latter as being concerned with leisure and hence in opposition to the 'working mind', which is concerned with labor.

The condition of coherence within visual culture was that the semantic fields which had the strongest centrifugal tendency – labor and all highly differentiated aspects of society – were excluded from the realm of images. Once language ceased to carry the full weight of general and abstract concepts, differentiation could be left to language, while film and television, as 'mass media', adopted a kind of middle space that unified large audiences. The tension within visual media is, thus, the following: In their radical concreteness, visual media did not replace the concreteness of natural language but merely its general concepts, that is, those abstract notions from which technical images always seemed quite removed. Technical images, in other words, solved the crisis of language precisely because their concreteness was able to overcome the destruction of meaningful general concepts. As a whole, technical images created a system, whose structure could not possibly 'lie.' Theorizing about technical images in terms of realism, truth and reference is not exclusively indebted to their iconicity, or to the direct access to a referent safeguarded by a technical apparatus – after

all, it was always accepted that images were manmade, selected, staged and fictitious. The fact that social mediation appeared to be abandoned in the realm of images was more important, so that a speaking without language seemed possible.

## The Crisis of Images

What is valid with regard to technical images might also be valid for non-iconic systems: the crisis of language might be repeated, one hundred years later, in a 'crisis of images.' There are many symptoms of such a crisis. Most obviously, the sheer quantity of images that circulate within visual culture has become inflationary in every respect. Even though theorists of visual culture always had a tendency to see this exponential growth as a sign of health, there are increasingly critical voices which note a proliferation within the universe of images: the system, it is said, has begun to disintegrate into an infinite and uncontrollable amount of insignificant events, while especially the rapid multiplication of available television channels envelops the audience in a fog of images: the initial resistance to private television in Germany during the early 1990s was only partly triggered by the actual content of the new TV channels, but rather stemmed from the irritation that television did not anymore speak in one voice.<sup>27</sup>

One of the difficulties regarding such statements is, certainly, that they are barely distinguishable from the conservative voices of cultural pessimism that always sought to protect literature from visual culture. But the phenomenon itself can hardly be ignored. It is not surprising that the

<sup>27</sup> Already in 1980, Jean-Louis Comolli, 'Machines of the Visible,' in Teresa de Lauretis and Stephen Heath (eds.), *The Cinematic Apparatus*, London 1980, p. 141, noted that 'cinematic representation' did not do anything 'other than pile visible on visible.' See also Hans Magnus Enzensberger, 'Das Nullmedium oder Warum alle Klagen über das Fernsehen gegenstandslos sind,' in *Baukasten zu einer Theorie der Medien*, Munich 1997, pp. 145–58.

sheer quantity of images affects the things and events that can be photographed: the outside surfaces have multiplied themselves in the realm of images, which increasingly buries the images as well as the events and things themselves. That which has never been seen becomes increasingly rare; the photographic surface of the world may be finite after all.

But the quantitative growth of images also has an effect on the substance of images. The more images are viewed, the less these images are seen as concrete. Images begin to pile up, superimposed on one another. Ultimately, they begin to generate stable structures, schemata and patterns which organize visual culture beneath their superficial differentiation. This process, of course, makes visual culture 'dense' and conventionalized. Despite their emphasis on difference and concreteness, images enter a mechanism that transforms discourse into system, extracting general structures from concrete discursive events. This mechanism increasingly offsets the autonomy of the single image. It is, then, not at all the case that merely the cultural memory of an audience, or the structure of its expectations, undergoes changes, while the images themselves are able to safeguard their substance. The mechanism of condensation is a social arrangement, even though it might take place in the perception and memory of the viewing individuals. Just as language stands in opposition to speaking, this mechanism limits the space within which meaning is able to emerge and forces the individual images into a conventionalized background. This, one might say, is the reason why the images themselves do not remain substantially the same. How quick this process of conventionalizing images is, and how quickly images turn into a 'language,' depends on the density of the visual discourse. Either way, visual conventions cannot be avoided: to constantly produce 'fresh images' – as the director Werner Herzog, standing on the Tokyo Tower, hopes in Wim Wender's documentary *Tokyo Ga* – is certainly wishful thinking. As such, the world of images will face the same problem that already dominated the crisis of language.

The basis on which technical images were able to establish themselves begins to evaporate. Their emphasis on concreteness becomes meaningless, while a skeleton of structures moves into the foreground. This, it seems to me, lies at the heart of the crisis of images that currently haunts media culture. With an unwillingness to accept the visual repetition of the same,

to accept clichés, with a feeling that images have lost their content and thus their justification, and with an increasingly ironic perception, the crisis of visual culture has also reached the realm of everyday life.<sup>28</sup> A theoretical approach, however, needs to adopt different criteria, and these criteria also allow us to examine in more detail the universe of digital information.

## The Computer

The most obvious conclusion to be drawn from the above is that, in the realm of digital information, the generation of signifieds does not disappear, but it is simply *avoided*. The new medium of the computer blocks the generation of signifieds. Like technical images, it creates a system which claims to proceed without convention, without language and without 'condensation.' Technical images were able to point to their concreteness and iconicity; the computer is able to point to a universe of texts, freed from language and filled with new hope. Language has been replaced by a surface of 'texts', and in contrast to traditional notions of 'writing' the new textual universe appears rather user-friendly. Since this textual universe is not in any way limited in its outreach, and since each point within the universe is equidistant to every other point, everyone is able to become an 'author.' There is no publisher that selects, or might reject, a manuscript, and in contrast to traditional mass media the relationship between sender and receiver is not a one-way street. Furthermore, there is no need for consensus, so that the hierarchical mechanism of society seems to have lost its power. The emphasis on accessibility, together with the absence of hierarchies, promises a return to an already established utopia, the utopia of suspending the need for social mediation.

28 Empirical studies have shown the increasing dissatisfaction of the average television viewer. See Winkler, 'Das Ende der Bilder?', pp. 229–30.

But at the basis of this new arrangement of media technology remains a deep-rooted fear of the arbitrary. As a recurring motif, this fear connects the crisis of language with the chain of its solutions, and the history of media itself begins to appear as a series of attempts to find a technological solution to the problem of arbitrariness. We need to keep in mind that the very notion of arbitrariness has a double meaning, referring to 'random choice' but also to a social or historical determination. This has a doubly uncanny effect: on the one hand, signs have no foundation in the world, which defines their dangerous status of ambiguity; on the other, and in relation to their historical conditions, they are not 'free' – far removed from any 'truth', they continue to refer back to the discourses of the past, to their lies and illusions. Media history is always an attempt to escape this uncomfortable situation, negotiating between nature, signs, and technology in order to resist the threat of arbitrariness.

Nevertheless, once the crisis of images was in full swing, some commentators began to hyperbolically deconstruct the claims of visual culture, arguing that the presumed iconicity had always disappointed the expectations that it was invested with; the privileged access to reality, they argued, had always been an illusion and it finally became obvious that signs did not refer to the world, but merely to other signs. Most interestingly, however, it was precisely the concept of 'simulation', developed as a critique of the value of visual culture, which was now supposed to accurately describe the feats of the new medium: the computer simply gave up what had already been problematic in the realm of images, and the new consensus was that the signs operated by computers did not claim to have any reference to reality whatsoever.

Taking into account what we have said so far, however, it should be obvious that this is not the case. On the contrary, as soon as we shift our attention from iconicity itself to its function as a means of overcoming arbitrary signification, and as soon as we realize that arbitrariness itself has a host of contradictory implications, we are able to recognize a surprising continuity between technical images and digital media: while the computer has rendered iconicity obsolete, it still continues the same cultural project, that is, it offers support to the endangered arbitrary forms of signification.

If this is indeed plausible, we can acknowledge that media history entails a strategic dimension. Much like the actual implementation of new media, their technical efficiency or their deficits, the discourse we build around these new media is able to either bolster or weaken the trust we invest into the substantiality of signs. Our ideas, hopes and wishes immediately enter the semiotic process. They are 'productive' in the Foucauldian meaning of the term and we would do well to include them in our interpretative approach.

Generally speaking, semiotic systems seem to follow a certain life cycle in their evolution, which leads from a hopeful early phase to a quasi-naturalized period of domination only to culminate in disillusionment. The history of media responds to this final phase with new technological innovations that restart the cycle from the beginning. For each medium it is therefore important how long the initial hopes can be kept alive and what they actually contribute to the stabilization of the system as a whole. The discourse we built around the computer, which explicitly denies any reference to reality, thus emerges as a strategic cover under which our actual hopes can develop ever more vividly. We should have known: a technology that labels itself as dealing with 'information' needs to answer the uncomfortable question as to what the content of this information is actually supposed to be. Taking into account that empirical research often tends to confuse its 'data' with reality, we can take this as an indication that the 'old' problems of signification, meaning and reference will return with a vengeance. In relation to this, Vilém Flusser remarked ironically that it might perhaps be more adequate to speak of 'facts', that is, of something that is 'made', rather than of 'data', which implies something that is 'given.' But ignorance is exactly what makes the early phase of each new medium so appealing. The rhetoric of novelty is based on the attempt to solve originally non-technological problems with technological innovation, thus simply suspending whatever seemed precarious with regard to our old media.

Deconstructing the strategic cover of the computer as an innovative medium does not consist, however, in accelerating cultural disillusionment, but rather in minimizing the effort with which we read the new medium. We do indeed approach new media in much the same way as we approach a text: we trace their meaning and invest a considerable amount

of our lifetime in order to familiarize ourselves with their internal structure. This is particularly the case with regard to the computer. As such, it is not difficult to see that the transition from the realm of visual culture to the world of digital machines is less radical than is generally assumed. But the difference between images and information does not diminish because of the fact that computers, among many other things, also happen to process images. Rather, images themselves have proven to be, above all, a semi-otic structure. If the process of conventionalization within modern visual culture has shown, as it were, the 'skeleton' of the image below a radically concrete visual surface, it is only natural that the history of media should now favor a medium that is based on abstraction and schemata right from the beginning.

The first continuity between the world of technical images and digital information is that its recipients have always shown interest in structures, such as visual order and its semantic implications within the world of images or the complex temporal and semantic patterns that mark moving images. The new medium of the computer, and this is its innovative contribution, merely isolates this structural dimension, rendering it more explicit. Any investigation would have to observe this effect and develop an explanatory language within which it might be possible to describe the structural project of this new medium. The debate about linearity and cyberspace can provide first insights with regard to this, and it is worthwhile to examine the actual textual practices within the new medium, extracting their common denominator. In any case, beyond the language of textual documents within cyberspace we can find a clear structure of their organization as well as the numinous hope that this organization is able to deliver what the documents themselves, the schemata and their language, cannot provide – much like traditional visual media.

This, of course, also refers to the role that images adopt within the new medium. The processing of numbers, texts, algorithms, images and sounds might not always take place on the same level, and not all symbolic systems can equally be transformed into bits and bytes. It is a fundamental difference whether a computer is supposed to save and send texts in natural language or whether it is supposed to look for meaningful semiotic structures, whether data are processed through statistical analyses

or whether the color of images is supposed to be changed on the screen. The main question, thus, seems to be what computers are able to do with different data. Different symbolic systems can be processed by equally different algorithms with variable efficiency: while complex mathematical systems can be processed by extremely efficient algorithms that allow for coherent, lawful permutations as well as a meaningful reduction of data, algorithms dealing with natural language are far less impressive, mainly building searchable indices and operating with statistical word counts – in any case, haptic and olfactory ‘data’ still resist their transformation into meaningful digital information.

Images are clearly somewhat removed from seemingly elegant mathematical operations. Of course, it would be shortsighted to ignore the recent rise of digital image processing, post-production and image synthesis. But it is important to realize that digital image processing requires considerable effort and does not represent a straightforward triumph of abstraction over the concreteness of visual culture; the exorbitant processing power required for images (as well as sounds) makes it more than obvious that this is not really the strength of computers. To make matters worse: this begs the question whether the digital processing of images is really based on *visuality*. Whatever appears on the screen as an ‘image’ is first and foremost addressed to a human individual. As a result of operations that have little to do with the *visuality* of the image, the image itself remains a two-dimensional representation on the surface of a screen, while the applications with which this image has been processed wait for our aesthetic judgment and the intervention of the human user in order to proceed. Computers do not have any access to the visual character of the image – not yet, in any case. There are no simple algorithms for the recognition of visual forms, or for the analysis of visual content, and a comparative interpretation of images requires considerable processing power: both the FBI and the German BKA (Federal Criminal Police Office), for instance, have to employ dual processors in order to extract still portraits from video material. As a consequence, all digital systems that want to access images need to refer back to secondary patterns of a linguistic or numerical nature: image databases organize their content according to searchable terms, names or numbers, which affect the position of the respective images within their order as a whole.

Indeed, measured against the ideal of a continuous flow of data, images seem to be a dead end, a two-dimensional traffic jam within the *n*-dimensional universe of information, a ‘surface’ that seeks a compromise with the human eye. The current excitement about digital images seems to be nothing but the expression of a transitional phase. Reduced to their illustrative function – as in the case of virtual museums that make the scanned images of masterpiece paintings globally accessible only in the most dismal resolution – images seem to remain appendages of those structures that are actually productive.

What, then, do digital images refer back to? In the case of basic computer-aided design, it seems, they refer back to the virtuosity of the user, which is a rather dull return to a pre-modern kind of visual culture. Secondly, they also refer back to the historical state of software development that we can gauge by the quality of the image. But whenever ‘realism’ is seen as a standard for digital processing, a new, mimetic dimension becomes apparent: the realistic digital representation of the motion of the human body, the movement of facial expressions and natural phenomena contradicts the widespread assumption that digital images are non-referential. In the face of terrifyingly endless algorithmic possibilities, this exemplifies our need for some kind of standard. At the same time, the concept of *mimesis* needs to be re-examined within this context: while representation and similarity might remain at the heart of *mimesis*, it cannot be reduced to either of these concepts.

Most strongly, however, digital images refer back to the play of semi-otic structures themselves: the synthetic visual simulations that mark the aesthetics of contemporary computer-generated music videos perform the dance of data in terms of complex rhythmical patterns, illustrating their proximity to mathematical chaos. One of the general tendencies of the modern avant-garde, the tendency toward abstraction, has reached the universe of technical images. Largely absent from the world of photography and film, abstraction had to await the advent of the computer, although within modern art it already anticipated our current situation within the history of media.

In a curious analogy to Plato’s cave, our task is to conceptualize what appears in these representations: for Plato, knowledge had to find an access to ideas behind the world of appearances, but for the digital universe we

have to find an access to those structures that are vaguely present within the concrete experience of the applications we use. That there is a relation between these symbolic systems despite their obvious differences, that there is a kind of common project represented by both visual culture and the digital universe, is the main argument of this article. The crisis of the signified has triggered this project, which we generally understand as 'the history of media.' The suspicion of the signified, the fear of arbitrariness, social mediation and history connect the universe of the computer to the universe of technical images. Much like the technical images, the flow of information aims to be a 'speaking without language.'

*Translated by Christian J. Emden*

CULTURAL HISTORY AND LITERARY IMAGINATION

EDITED BY CHRISTIAN J. EMDEN & DAVID MIDGLEY

VOL. 9

ImageScapes

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**Bibliographic information published by Die Deutsche Nationalbibliothek**

Die Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available on the Internet at <http://dnb.d-nb.de>.

A catalogue record for this book is available from the British Library.

Library of Congress Cataloging-in-Publication Data:

ImageScapes : studies in intermediality / Christian J. Emden, Gabriele Rippl.

p. cm. -- (Cultural history and literary imagination ; v. 9)

Includes bibliographical references and index.

ISBN 978-3-03910-573-1 (alk. paper)

1. Mass media and literature. 2. Intermediality. 3. Mass media and the arts. 4. Intertextuality. I. Emden, Christian. II. Rippl, Gabriele.

P96.L5143 2010

809'.93355--dc22

2010028047

ISSN 1660-6205

ISBN 978-3-03910-573-1

© Peter Lang AG, International Academic Publishers, Bern 2010

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Printed in Germany

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