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The Age of Non-Reproducibility

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Abstract. Ever since Walter Benjamin's famous essay *The Work of Art in the Age of Mechanical Reproduction*, it is a central idea of media theory – or approaches related to the field – that media enhance and accelerate reproduction and copying. Technologies like the copier, distributed since the 1960s add to this idea. The step from analogue to digital media seemed even more to be an increase in reproducibility. The difference between original and copy seemed to vanish at all. This loss of difference between original and copy is also a central topic in postmodernist theories of "simulation," which are especially connected to the name of Jean Buadrillard. The essay tries to sketch a short history of theories of reproducibility, copy and simulation – and to show their limits. Obviously, the permanent increase of reproducibility also needs an increase in technologies to prevent copying, e.g. in regard to money or documents like passports. So the history of reproducibility has a shadow: the history of techno-juridical ensembles of non-reproducibility.

The broad field of 20th century media theory debate is hardly something that lends itself to succinct summarising. One striking fact, however, is that 'reproducibility' is a recurring theme. What is seen as a distinguishing feature of technical media (since the emergence of photography and film, and in particular, the emergence of the new media) is that the content they store can easily be reproduced. And what is more, their content is designed to be reproducible; it seems as though the very difference between original and copy is becoming obsolete. This has been described by various theorists with varying emphasis as a specific feature and an objective of media development: Part 1. of this article will briefly present a few relevant positions. The mere existence, however, of terms such as *piracy* (cf. Yar 2005) or 'pirated copy,' and of campaigns against 'copyright pirates,' shows that reproducibility is not an unreservedly welcome phenomenon. Reproducibility clashes with the economic imperative of scarcity, and therefore with legal regulations. Thus judicial, technical and didactic procedures work together to prevent unauthorised reproduction – this is briefly outlined in Part 2. Finally, Part 3. offers a short conclusion.

1.

The obvious association evoked by the term 'reproducibility' is Walter Benjamin's well-known text, *The Work of Art in the Age of Its Mechanical Reproduction*, first published in French in 1936. It should be noted that Benjamin, thinking to diagnose a whole epoch, describes an '*age* of technological reproducibility' (as the better translation would be), one which, however, initially refers mainly to the work of art. He does stress that the work of art has always been manually reproducible, but: "Technological reproduction of the work of art is something else, something that has been practised intermittently through history, at widely separated intervals though with growing intensity" (Benjamin 2008, 3). Thus it seems that reproducibility has at least intensified in the modern period.

According to Benjamin, the results of this intensification are firstly "the most profound changes" in the impact of "traditional artworks" (Benjamin 2008, 5). Reproduction detaches the artwork from tradition and makes it "come closer to whatever situation the person apprehending it is in" (Benjamin 2008, 7); the exhibition value supplants the cult value. Secondly, he underlines this diagnosis by pointing to the emergence of art forms – photography and cinema – which are already structurally designed to be reproducible: "From a photographic plate, for instance, many prints can be made; the question of the genuine print has no meaning. However, the instant the criterion of genuineness in art production failed, the entire social function of art underwent an upheaval" [emphasis in the original] (Benjamin 2008, 12).

Benjamin's suggestion has been taken up repeatedly in recent debates on the subject. Rosalind Krauss, for example, wrote: "The structural change effected by photography's material base is that it is a medium of direct copies, where there exist multiples without an original" [emphasis in the original]. She takes this as evidence of a "totally new function of art" (Krauss 2001, 1002), arguing that the art of modernity cannot be understood without this recourse to photography as a multiple without an original (and the art of so-called postmodernity still less). She thus regarded the appropriative art forms of the 1980s, which worked closely with the strategy of the copy, as particularly important. She pointed to the work of artists such as Sherrie Levine, who had, for example, photographed the photos of Walker Evans and presented them as her own work.

But Benjamin had already noted that "its significance [i.e. that of reproducibility, J. S.] points beyond the realm of art" (2008, 7). And indeed: even without explicit recourse to Benjamin, comparable diagnoses were made elsewhere. Günther Anders, for example, had remarked on television reporting

in his 1956 text, Die Welt als Phantom und Matrize (The World as Phantom and as Matrix): "When the event in its reproduced form is socially more important than the original event, this original must be shaped with a view to being reproduced: in other words, the event becomes merely a master matrix, or a mold for casting its own reproduction" (Anders 1956, 20). Again, reproduction seems to be the signature of an epoch, replacing the 'original,' whatever that might be, and/or cancelling out the difference between original and reproduction. Admittedly, Anders was referring to television rather than to photography and film, and his attitude towards this change was marked by much greater cultural pessimism than Benjamin's.

Another similar but more affirmative diagnosis is found in the work of Jean Baudrillard, beginning in the mid 1970s. Very briefly: he formulates – partly with reference to Benjamin – a history of simulacra. His argument is that 'Western' societies, after a phase of imitation in the Renaissance and a phase of industrial production of identical objects, entered the era of 'hyperreal simulation' at some point (he does not specify when) in the 20th century (cf. Baudrillard 1993, esp. 70–76; on Benjamin, cf. e.g. 55–57). By 'simulation' – insofar as it is possible to precisely determine this in his sometimes confusing texts – Baudrillard does not mean (or only means in a metaphorical sense) the construction of performative models in computer simulation, which has become increasingly important, particularly in the military, in technology and science, since 1945 (cf. Schröter 2004a). Instead, his main contention, rather like Anders's (cf. Kramer 1998 on Baudrillard and Anders), is that reproduction has already secured a conclusive victory over the real, and that original and copy can therefore no longer be distinguished. If I understand correctly, he seems to argue that nowadays no substantial depth of reference can be assumed to exist behind the chains of signifiers pointing exclusively to other signifiers – political attitudes, for example, are becoming interchangeable lifestyle accessories. In any case, Kramer summarises as follows that: "simulation thus levels out the differences between original and copy, between the real and its reproduction, and in the end eradicates all references to the referent" (cf. 1998, 259).

Whatever one may think about individual aspects of this strident diagnosis, Baudrillard's texts were extensively discussed in the 1980s and early 1990s. It is probably no coincidence that a series of further publications on related issues followed in the 1990s and early 2000s. To name just two of these: Culture of the Copy is the title of a 1996 book by Hillel Schwartz. In 2004, a book entitled OriginalKopie. Praktiken des Sekundären (Original/Copy. Practices of the Secondary) was published in Cologne at the research centre for "Media and cultural communication," describing diverse forms and processes of reproduction (cf. Fehrmann et al. 2004). We can see, even beyond the question of originality

and its relationship to copy in art, an increasingly firm diagnosis that we live in an 'age of technological reproducibility,' a 'culture of the copy,' even the 'era of simulation.' And this diagnosis does seem plausible. Just a few examples, deliberately taken from a wide range of spheres:

a) Science: the sciences relevant for modernity are based on an epistemology of experiment (however problematic this may be), in which the reality of a theory can only be confirmed if an effect is reproducible. Baudrillard wrote: "The very definition of the real is that of which it is possible to provide an equivalent reproduction" (1993, 73). In this sense, reality depends on its reproducibility.

b) Material production: the industrial manufacturing of goods surrounds us with an abundance of largely identical copies, e.g. of chairs. These obviously follow a reproducible prototype. Andy Warhol gave a well-known, ironic commentary on this development with endless series of Campbell's soup tins and Brillo boxes.

c) Production of signs: reproducible photography covers the world with identical-looking photos. Then, of course, we all use photocopiers to duplicate written documents or pictures, a development Benjamin could not have foreseen. And finally, the emergence of digital media really seems to have brought about the collapse of the difference between original and copy. Digital data is, on a basal level, just a sequence of zeros and ones, and if one simply copies this sequence (or if a computer does), the resulting file is exactly the same as the original. Unlike analogue processes, copying no longer causes a loss in quality, distancing the copy from the original. The difference becomes obsolete. Indeed, the argument initially seems more convincing for digital data than for photography (the focus of Benjamin's and subsequently Krauss's theses); most photographic procedures, after all, still distinguish between an original negative and the positive prints.

This, then, is the grand narrative recounted by certain representatives of media theory: we are entering an 'age of reproducibility' in which everything and everyone will soon be able to be reproduced – and the difference between original and copy will thereby collapse. Thus, for example, Geoffrey Batchen also claims: "We are entering a time when it will no longer be possible to tell any original from its simulations" (2000, 10). Cinema and television are full of corresponding phantasms, particularly in the case of science fiction. There are the fantasies of genetic reproduction, suggesting that we will soon be able to create identical clones of dinosaurs, humans, etc. Or phantasms of virtual simulation, in which future computers will be able to reproduce the world in its materiality – just think of the 'holodeck' from the popular American television series Star Trek – The Next Generation (1987–1994) or, of course, the film The

Matrix (Andy and Lana Wachowski, 1999) (cf. Schröter 2004b, 152–276). The simulations shown here are (almost) as real as reality; the difference between original and copy becomes meaningless.

2.

Having followed this idea to its final, phantasmatic climax, a critical commentary on this grand narrative is pertinent, and several points of departure offer themselves here. From a historical point of view, for example, we can ask whether culture has not always been based on the reproducibility of linguistic signs; thus reproducibility is not exclusively correlating with technical or new media. One should also draw attention to the historical contingency of reproducibility as an attribute of certain technical media: photography, for example, is not reproducible 'in itself,' there have also been non-reproducible photographic processes (daguerreotype, polaroid, etc.).

The thesis that we live in an age of technological reproducibility can be criticised from another angle point, too. The thesis is: the expansion of reproducibility – regardless of whether the principle has always existed or not – into an increasingly broad range of subject areas inevitably entails the emergence of strategies of non-reproducibility. The description of modernity as an age of ever increasing reproducibility is not false, but one-sided. Modernity is also the age of technological non-reproducibility. Especially if, like Anders or Baudrillard, one takes this as evidence that the difference between original and copy is imploding – or has imploded.

For it is obvious that this difference still exists on an everyday level, despite the expansion of analogue and digital technical media: The reproduction of e.g. money, secret documents, and identity documents is prohibited for all but certain institutions. Otherwise the criteria for their 'authenticity' – and this means nothing less than their operability – would be nullified. These types of documents function on the basis of a distinction between original and copy – a copied banknote is no longer a banknote. Of course, there is a history of "unauthorised reproduction,"[1] as it is explicitly called in the relevant guidelines in the European central bank, and the counterfeiting of coins, for example, has long attracted severe penalties (cf. Voigtlaender 1976). There are legal regulations against certain forms of reproducibility – regulations which find expression in pejorative terms such as 'pirated copy' or 'piracy.'

1 EZB/2003/4, *http://www.ecb.int/ecb/legal/pdf/l_07820030325de00160019.pdf.*

But the legal penalty always comes after the fact. When it comes to the currency system, the damage must be prevented in advance, since large-scale counterfeiting would lead to inflation and could even bring about an economic collapse. Because of these dangers, increasing efforts were made in the 20th century to delegate the legal prohibition to technical – and sometimes legally protected – processes, simply to cope with the increase in reproducibility. One way in which reproducibility has increased is the spread of photocopiers since the 1960s.

Parallel to this increase, new types of non-reproducible markings have been devised, or old techniques, such as the watermark (cf. Gerstengarbe et al. 2010), have been resurrected – watermarks are also found on banknotes. But such technical processes as watermarks only work if the subjects concerned – i.e. all of us – know how to decipher the marks denoting authenticity – hence the mass distribution of information about physical and attentional techniques which help to detect forgeries.

The German police advice website polizei-beratung.de gives information on a holographic 'special patch' on the lower right hand side of the 50 euro note: "On the right of the front of the note is a special patch. If you move the banknote, then depending on the angle of viewing either the value of the note or the architectural motif depicted on the note appears in changing colours as a hologram [...]."[2] So one is supposed to learn how to move the banknote, and what to pay attention to in order to be able to distinguish genuine from fake, original from copy. The hologram added to the banknote, which changes its appearance in the light and which cannot be photocopied – e.g. with a modern colour copier – helps achieve this.

To support this aim, the website provides a Java applet with the name 'Euro-Blüten-Trainer' ('fake euro trainer,' sometimes translated as 'funny money advisor') [Fig. 1.]. Here, applying comparative visual analysis in a way Heinrich Wölfflin would surely never have imagined, one can learn to recognise the crucial security markings on banknotes. "Train your gaze to 'incorruptible inspector' standard." Similar training software with corresponding short films can be found on the website of the German Federal Bank.

This didactic endeavour also includes film and poster campaigns such as "Copyright pirates are criminals" [Fig. 2.]. These and similar disciplinary paratexts are important since – and this brings us back to the legal side – there are severe penalties (prison sentences of up to five years) even for unknowingly passing on counterfeit money. These paratexts interpellate all of us, alerting us

2 *http://www.polizei-beratung.de/attension_ressources/downloads/infotexte/Falschgeldkriminalitaet.doc.*

to our duty of learning the physical and attentional techniques which will help us recognise legally protected technical effects that signal the criminal offence of unauthorised reproduction of money or documents.

For this reason, counterfeiters try to distribute their fake notes in chaotic, hectic situations where there is too little time and/or light for a thorough examination. In summary: the aim is to prevent unauthorised reproduction with a heterogeneous combination of three components:

(1) legal threats and the institutional conditions which allow them to function: the legal-institutional complex;
(2) technical effects which cannot be reproduced by the general public (e.g. holograms);
(3) physical or attentional techniques focused on the special effects provided by the technical processes at (2), in order to recognise the differences between authorised and unauthorised reproduction defined according to (1).

This heterogeneous configuration, designed to stabilise what one might call the reproductive difference between original and copy, appears in a wide variety of areas. I will outline just a few of these.

In the area of material commodities, there is product counterfeiting. At the beginning of 2009, a group of secondary school students from Lübeck went on a fatal drinking spree in Kemer, on the Mediterranean coast of Turkey, drinking raki laced with methanol. Following this incident the Süddeutsche Zeitung of 3 April 2009 reported on problems with the counterfeiting of raki in Turkey, and more precisely on "2005, the year of the raki crisis," in which one incident stands out in particular: "First of all, 500,000 holograms, which were supposed to be attached to bottles to guarantee the authenticity of the liquor, were stolen from a raki distillery in Izmir" (transl. from Strittmatter 2009, 10).

Two points can be deduced from this. Firstly: even if Baudrillard may be right in thinking that industrial mass production of goods has led to an unprecedented spread of identical series of objects, this does not necessarily nullify the distinction between original and copy (cf. the example of machine construction: Paul 2010). Secondly: holograms are mentioned again here, as in the discussion of banknotes above. Holography is one of a number of irreproducible photographic processes, designed to curb reproducibility in conjunction with corresponding legal institutions and physical techniques. An original hologram is easy to recognise due to its specific visual features, and no copier can copy it in such a way that these features remain intact. The fact that there are small, identical holograms on many banknotes shows that holographs can be reproduced in certain circumstances, but not by the general public.

Reproducibility is not something that exists or does not exist; it is present in a graduated and variously distributed state (cf. Schröter 2009).

As already mentioned, one of the most important areas in which reproducibility must be contained and reduced, is that of documents pertaining to governmental and economic structures. Money and identity documents, etc. must only be duplicated or produced by the appropriate institutions. These documents are generally to be found in wallets. You, dear reader, can understand this easily: you have, in your wallet, firstly your identity documents, and secondly money or cards which you can access money with. You can easily verify the vital importance of this archive of non-reproducible elements for your economic and political existence, i.e. your existence as a bourgeois and citoyen. Go to a bank without a credit card or identity card and try to get money. Try to travel to another country without a passport – it might work, but bad luck if you strike a checkpoint. You can claim that you are creditworthy as often as you want, and cry all you like – no one will believe you unless you can present a real credit card or a real passport. You would be considered highly suspicious if you dared to present a photocopy of your passport (or your credit card). You are only 'yourself' by virtue of your original documents.

A clear difference does emerge here, though: in the case of money, you have to be able to recognise, e.g., a fake 50 euro note, i.e. you have to learn to distinguish it from other 50 euro notes. But you come across a lot of 50 euro notes, i.e. you have to learn to tell genuine copies from fake copies. With your ID card, the situation is somewhat different. It is only allocated to you, and, of course, it would make no sense to distribute numerous copies of it. I can scarcely use a copy of someone else's ID card to prove my identity, however good the copy may be. Here the non-reproducibility of the ID card is connected to the prototype of my signature and face. My signature and the photo of my face connect me and my identity document indexically (this also applies to biometric data).[3] My face and my signature have to match the face and signature on the document – and vice versa. Thus the prototype has to be reproduced, but it is fixed on a document which is rigorously protected against unauthorised production, by having security features which cannot readily be reproduced. This shows that it is not a matter of playing reproducibility and non-reproducibility off against each other, but of observing their actual

3 The indexicality of the signature is also demonstrated by the fact that, e.g., erasable pencils are not 'acceptable for use on official documents,' since the trace can be deleted or changed (cf. *http://de.wikipedia.org/wiki/Dokumenten echtheit*). A particularly strange phenomenon, which we cannot go into here, is the so-called 'facsimile signature stamp,' i.e. a stamp which imitates a hand-written signature as closely as possible.

configurations, historically, culturally, even situationally. This essay is just a preliminary attempt to chart this difficult terrain.

The ID card, which I cannot validly produce myself, assigns my face, and therefore my body, to my name. And this ID card can only be allocated to the specific, i.e. addressable person, by the approved governmental body. A person can be defined as a living body + an identity document.[4] Much the same can be said for staff ID cards, company ID cards or military ID cards. Access to certain institutions or resources can only be obtained through such processes of identification; this is why 'identity theft' (cf. Hoofnagle 2007) is now a key crime in the areas of espionage, industrial espionage, illegal immigration and emigration.

While every banknote in a series shows the same reference, e.g. 50 euros, the singular reference is the difference between ID cards. The issue with ID cards is therefore to distinguish a fake from a genuine original. Strictly speaking, every banknote is also an original, since it has a singular number, but here the question is always whether a given banknote is a valid copy of its prototype. Besides, as users in practice, we do not really have any opportunity to check whether the number is correct – e.g. by visiting a bank. Hence we can and generally must disregard this singularity and differentiate, in the case of banknotes, between fake and genuine copies.[5] This strange expression may cause discomfort – perhaps it would be better to say 'authorised' and 'unauthorised' copies – but, from the point of view of the authorising bodies, this is the same as the difference between genuine and fake.[6]

In the art system, of course, the distinction between original and copy is still maintained. This is particularly evident in the 'vintage print' in photography, a

4 It is not customary to possess ID cards in every country or culture, though – this should be made the subject of a comparative cultural study on the production of identity. In the conditions of modern mass societies, however, some sort of mechanisms of identification are generally necessary, cf. the very detailed overview at: *http://en.wikipedia.org/wiki/Identity_document*.

5 Both Jochen Venus and Timo Schemer-Reinhard have raised the question of whether it would be better to speak of banknotes as 'specimens' or 'examples' (in German: 'Exemplare') rather than 'copies.' This question is quite justified, but it raises the further question of how to distinguish between 'example' and 'copy' – a difficult question which can only be hinted at here. The first problem is that the distinction may only be possible in certain languages – what is referred to as an 'Exemplar' of a book in German is simply called a 'copy' in English.

6 In an email of 14 November 2009, Jochen Venus objected: "The distinction between a 'genuine copy' and a 'fake' one seems to me to be contrary to the meaning of the term copy. I don't think you would talk about a fake imitation either." And yet, clearly, this difference does exist, as one can see from the phenomenon of 'certified copies' of documents issued by administrative bodies (cf. *http://de.wikipedia.org/wiki/Beglaubigung*).

practice which would undoubtedly have seemed very peculiar to Walter Benjamin, and would probably also strike Rosalind Krauss as odd. The first print made from the negative by the photographer is valued higher than every subsequent reproduction, and there are always conflicts about the secure documentation of these processes. It is, furthermore, standard practice today for photographers to make just a few prints of their photos – sometimes even destroying the negative after producing the prints – to ensure that only a small number of copies are in circulation. Thus even the works of Appropriation Art, which Krauss valued so highly, have now become expensive originals.

In the digital field, too – and especially here – the reproductive difference is continually being reconstructed. Precisely because a loss-free reproduction could theoretically diminish the difference between original and copy (if one disregards the frequent need to compress data, thus entailing losses [cf. Salomon 2008]), the frantic efforts to rebuild this distinction are redoubled. In the digital realm, increased reproducibility seems liable to break down the object's nature as a commodity and thus the very condition that makes an economy possible. A digital commodity – software, a film, music – can be reproduced any number of times. This has a huge negative impact on its commercialisability if the digital commodity is reproduced by users rather than producers.

But the problem is even more fundamental: whether I hand over a piece of software for money or for free, I always keep a copy. No exchange takes place, and thus the object's nature as a commodity seems questionable (cf. Grassmuck 2004).[7] Again: strict laws and their institutions of enforcement, complicated technical processes – think of digital rights management[8] or copy protection systems for DVDs (cf. Heilmann 2010) and audio CDs (cf., for example, Wöhner 2005) – and physical and attentional techniques are supposed to prevent the technical potential of digital technologies from becoming usable, because this potential is not compatible with the economic principles which are currently in place.

7 See an article by Stefan Meretz on the trial to stabilise the commodity-form in digital media: *http://www.opentheory.org/kampfumdiewarenform/krisis_31_meretz.pdf*.

8 On DRM, see the wealth of information on the website *http://waste.informatik.hu-berlin.de/Grassmuck/drm/*. On the problem of law relating to digital media, cf. Boehme-Neßler (2008).

3.

Reproducibility presents a fundamental threat to the existing governmental and economic structures of modern societies; I believe Benjamin saw this much correctly, albeit in a different way.[9] Hence the emergence of dramatic terms such as piracy (cf. Yar 2005). To combat these threats, a heterogeneous ensemble of (a) special technological processes (such as holography), (b) legal regulations and (c) attentional techniques, is constructed. I call this the 'heterogeneous ensemble of reproductive difference.' It is intended to stabilise the differences between genuine and fake originals, and between genuine and fake copies.

The heterogeneous ensemble of reproductive difference is a mode of – to borrow Foucault's use of the term (1981, 58) – "rarefaction," without which neither the circulation of money, nor personal identity, nor the circulation of goods can be maintained. Such rarefactions seem, depending on the individual practice or subsystem, to be a more or less urgent necessity. It is nonsense to claim that the difference between original and copy is now obsolete. Whole industries, which earn their money by preventing copies and thus stabilising originals, have sprung up.

Some of the media theories, which this article began with, tend to consider the potential of technologies in an abstract way, separate from their social context, and thus draw overstated and one-sided conclusions about their effects. The reproducibility of some forms of photography, for example, leads them to announce an 'age' in which reproducibility conquers all. But the age of technological reproducibility is also the age of technical non-reproducibility. There seem to be social structures or imperatives which are more powerful than changes in media technology, but which, nonetheless, have to respond to these changes (cf. Winston 1998, 1–18). It remains to be seen how this struggle will end.

References

Anders, Günther. 1956. The World as Phantom and as Matrix. *Dissent* no. 3: 14–24.

Batchen, Geoffrey. 2000. Ectoplasm. Photography in the Digital Age. In *Over Exposed, Essays on Contemporary Photography*, ed. Carol Squiers, 9–23. New York: The New Press.

9 Benjamin hoped that reproducibility would encourage socialist transformations of society.

Baudrillard, Jean. 1993 [1976]. *Symbolic Exchange and Death*. London: Sage.
Benjamin, Walter. 2008 [1936]. *The Work of Art in the Age of Mechanical Reproduction*. London: Penguin.
Boehme-Neßler, Volker. 2008. *Unscharfes Recht. Überlegungen zur Relativierung des Rechts in der digitalisierten Welt*. Berlin: Duncker & Humblot.
Fehrmann, Gisela et al., eds. 2004. *OriginalKopie: Praktiken des Sekundären*. Köln: Dumont.
Foucault, Michel. 1981 [1970]. The Order of Discourse. In *Untying the Text. A Post-Structuralist Reader*, ed. Robert Young, 48–78. Boston: Routledge.
Gerstengarbe, Carina et al. 2010. Wasserzeichen. Vom 13. Jahrhundert bis zum Digital Watermarking. In *Kulturen des Kopierschutzes II*, eds. Jens Schröter et al., 9–62. Siegen: universi.
Grassmuck, Volker. 2004. *Freie Software: zwischen Privat- und Gemeineigentum*. Bonn: Bundeszentrale für politische Bildung.
Heilmann, Till. 2010. Digitale Codierung und Repräsentation. DVD, CSS, DeCSS. In *Kulturen des Kopierschutzes II*, eds. Jens Schröter et al., 95–112. Siegen: universi.
Hoofnagle, Chris Jay. 2007. Identity Theft. Making the Known Unknowns Known. *Harvard Journal of Law & Technology* vol. 21 no. 1: 98–122.
Kramer, Wolfgang. 1998. *Technokratie als Entmaterialisierung der Welt: Zur Aktualität der Philosophien von Günther Anders und Jean Baudrillard*. Münster: Waxmann.
Krauss, Rosalind. 2001. 1959, 9 January. The Ministry of Fate. In *A New History of French Literature*, ed. Denis Hollier, 1000–1006. Cambridge/MA:Harvard University Press.
Paul, Holger. 2010. Hologramme auf die Maschinen. Um sich vor Plagiatoren zu schützen, setzen die deutschen Maschinenbauer vor allem auf technologischen Vorsprung. Das reicht nicht aus, findet ihr Verband. *Frankfurter Allgemeine Zeitung* no. 15 (19 January): 20.
Salomon, David. 2008. *A Concise Introduction to Data Compression*. London: Springer.
Schröter, Jens. 2004a. Computer/Simulation. Kopie ohne Original oder das Original kontrollierende Kopie? In: *OriginalKopie. Praktiken des Sekundären*, eds. Gisela Fehrmann et al., 139–155. Köln: Dumont.
Schröter, Jens. 2004b. *Das Netz und die virtuelle Realität. Zur Selbstprogrammierung der Gesellschaft durch die universelle Maschine*. Bielefeld: Transcript.
Schröter, Jens. 2009. Das holographische Wissen und die technische Nicht-Reproduzierbarkeit. In *Das holographische Wissen*, eds. Stefan Rieger and Jens Schröter, 77–86. Berlin: diaphanes.

Schwartz, Hillel. 1996. *The Culture of the Copy: Striking Likenesses, Unreasonable Facsimiles*. New York: Zone Books.

Strittmatter, Kai. 2009. Selbstgebranntes Gift. In der Türkei sterben öfter Menschen, weil sie gepanschten Alkohol trinken – der Tod eines deutschen Schülers ist kein Einzelfall. *Süddeutsche Zeitung* no. 78 (03. 04. 2009): 10.

Voigtlaender, Heinz. 1976. *Falschmünzer und Münzfälscher: Geschichte der Geld-fälschung aus 2½ Jahrtausenden*. Münster/WF: Numismatischer Verlag Dombrowski.

Winston, Brian. 1998. *Media, Technology and Society. A History from the Telegraph to the Internet*. London: Routledge.

Wöhner, Thomas. 2005. Analyse und Bewertung von Kopierschutzverfahren für Audio-CDs. In *Sicherheit 2005*, ed. Hannes Federrath, 175–188. Bonn: Gesellschaft für Informatik.

Yar, Majid. 2005. The Global 'Epidemic' of Movie 'Piracy': Crimewave or Social Construction? *Media, Culture and Society* vol. 27 no. 5: 677–696.

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Figure 1. Euro-Blüten-Trainer ('funny money advisor'), screenshot. (*http://bluetentrainer.polizei-beratung.de/blueten_euro/ trainer_d.html*)

Figure 2. *"Raubkopierer sind Verbrecher"* (Copyright pirates are criminals).