The Question Concerning the Sustaining Support of Digital Objects

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ABSTRACT

This is a text printed on paper. I have written it using a computer. You might read this text in re-digitalized form, as a PDF file. In this case, you see it as the image of the document it became; it exists as a picture of itself. The pages in a PDF-file are not tangible (Gittelman, *Paper Knowledge* 114ff). However, if you are indeed reading this text in digital form, there will have to be some tangible thing making you see the image of this document. Some *thing* is functioning as an interface right now. Although I do not know exactly what this thing is, I know for certain that there is something here, slipping your mind as you read this text. This knowledge and this slipping away is what this thesis is about. This thesis aims to question the sustaining support of digital objects.

I try to challenge the habitualization towards digital devices, the forgetting of the physical interface that leads to the supposition of digital immateriality, by making the computer apparent as an absurd thing that escapes language. Leaning on Heidegger's »Question Concerning Technology« and Mel Bochner's mural stating that »No Thought Exists Without a Sustaining Support«, I seek to position myself among these strange and aloof digital things and their effects. I attempt to encircle the ungraspable realm of the computer's black box by explicating its *formal material* (Kirschenbaum), which results from the fundamentally irresolvable tension between the metaphysical idea of the Turing machine and the worldly *stuff* that embodies and performs it.

First, I approach this *stuff* through language. I introduce three metaphors to compare the computer to other worldly things: ruins (considering the existence of the machine, its resting body, and the expectations and promises it entails), vessels (thinking about its function), and windows (reflecting the notion of digital transparency and contingency). Then, I verbally enter the computer, contemplating how its mechanism depends on an act of inscription, a physical *in*-formation of material, and how its effects can therefore also be understood as writing, as embodied information.

However as computing has become ubiquitous, seamless and powerful enough to supersede the speed of thinking (Kittler S), it has become increasingly difficult, if not impossible, to phenomenologically grasp any friction resulting from this embodiment in the workings of the machines as they operate. In my practice, I physically grapple with this highly evasive body of digital media. Building on the metaphors and terminology I establish, and looking for comparisons between Bochner's post-conceptual sensibility and post-digital ideas, I aim to evoke the things on which I rely but that lie outside of language: I attempt

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with a knowing futility to (re-)insert myself in the processes of digital translation. I slow the effects of the computer down, I empty out its already silent interfaces, aiming to *re*-present it. I constellate and associate pieces of work, suggesting a grammar rather than a narrative, in order to listen to the »language of things« (Benjamin).

AUTHOR'S DECLARATION

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any other academic award or qualification other than that for which it is now submitted.

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»I have to choose what I detest — either dreaming, which my intelligence hates, or action, which my sensibility loathes; either action, for which I wasn't born, or dreaming, for which no one was born. / Detesting both, I choose neither; but since I must on occasion either dream or act, I mix the two things together.«

Fernando Pessoa, Text 2 of *The Book of Disquiet*

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0 This text exists in various materializations. I wrote it using a plain text editor on my computer and saved it as a txt-file. As it grew, I realized that its very existence as a digital object and more importantly the physicality of the bits encoding it, which lay outside my grasp, are what the conceptual content of this text is trying to encircle. To focus on the /stuff/ that is imperative for this text to become recognizable, readable, and thus conceptual, I decided to introduce it by explicating its material reality. I deliberately chose a poor quality representation, to trigger what Karl Schawelka describes as a ›frustrated synthesis‹ (26)--the complication of the well practiced and unconsciously performed act of recognition. As I do not want to seem intentionally obnoxious, the rest of the thesis is laid out conventionally. I am also attaching this introduction in this re-formatted form as an appendix.

This text now exists as the finished raw txt-file [1], as a laid out PDF-file [2], and in the form of five bound 'hard' copies [3]. One of those books contains the actual, physical pages that have become the images that make up the following pages in the PDF-file you might be reading right now. The bits that make up this text have been scattered across numerous devices: hard disks on remote servers, flash storage on ebook readers, printers, etc. Their physical presence has produced--or is producing--the concrete instantiation of the text you are reading right now, either as some kind of organized smudges resting on a substrate, or as a shadowy glow of a screen.

0. [INTRODUCTION. A PRELIMINARY NOTE AND A PRACTICAL DEMONSTRATION ON THE THING YOU SEE HERE / OR: ON THE THING BETWEEN YOU AND ME

This text was PRINTED on paper using a dot matrix printer. The printer received the 'raw' txt-file encoding the text as a string of letters, signs and spaces using 7-bit ASCII (American Standard Code for Information Interchange). A bit is a yes or a no, a zero or a one, an impulse or silence, a raised or resting arm, heads or tails... It does not matter what /thing/ a bit is, what matters is its potential to clearly embody a discernible difference, a clearly distinguishable state. Every /thing/ can be a bit. Seven bits can be combined in 128 different ways. These combinations are used in 7-bit ASCII to encode 33 non-printable control characters (Fischer 12-16)--such as

/Start of Header/, /Bell/, /Line Feed/, or /Cancel/

and 95 printable characters:

!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
{|}~ and /space/

The txt-file is 149.075 bytes 'heavy', translated into binary code it contains 471.327 'zeros' and 538.636 'ones'. The printer decoded this information and composed each character by printing small dots in a 9x9 matrix. They are easily discernible. It turned 1001 011 into K, 1110 011 into s, and 1011 101 into]. Again, these dots can be understood as bits, as 'ones' (printed dot) or 'zeros' (no dot). Although a 9x9 grid offers 241785163922925834941235 2 possible combinations of printed and unprinted dots, not many of these combinations can be recognized as characters that convey meaning. There are only a few different fonts preset on the printer. They link each ASCII character with one particular combination of printed and unprinted dots and thus define that 1001 011 looks like this particular K .

The PDF you may see now was written using black and white scans of these dots printed on paper: a immensely complex redigitalization of this invisible string of bits that I write by hitting the keys of my laptop.

1 Bonnie Mak likewise notes that »despite its central role in the transmission of thought, the page often passes without registration or remark. So habituated to its operation, we often overlook how the page sets the parameters for our engagement with ideas« (9).

This text was printed on PAPER. The paper remains /evident/ and /manifest/. (Unless you are reading this text in digital form, then it is only /evident/, as /manifest/ derives from Latin, /manus/ = 'hand' ('manifest'), whereas /evident/ stems from Latin /videre/ = 'to see' ('evident')). However, if you read the text printed on paper, the paper may seem to become invisible, to lose its evidence while you read:

[QUOTE] Where is the book I held in my hands? It is still there, and at the same time it is there no longer, it is nowhere. That wholly object, that thing made of paper, as there are things made of metal or porcelain, that object is no more, or at least it is as if it no longer existed, as long as I read the book. For the book is no longer a material reality. It has become a series of words, of images, of ideas which in their turn begin to exist. And where is this new existence? Surely not in the paper object. Nor, surely, in external space. There is only one place left for this new existence: my innermost self. [UNQUOTE] (Poulet 4) <--1

As you see here, if I take any text written or printed on paper, crumple it up and then flatten it out again, it is much more unlikely for the paper to become invisible in this way, to be actively filtered out, or repressed, the way George Poulet described. The text is still here, its abstract content unchanged, but the slight damage increases and thus brings to attention what can be described as the background noise of the material support of the writing, its /thingness/ made explicit and palpable, /manifest/.

In /Thing Theory/, Bill Brown explains that we are seldom confronted with this thingness of things, as "we look through objects [...], because there are codes by which our interpretive attention makes them meaningful, because there is a discourse of objectivity that allows us to use them as facts" (5). He describes the realization of the thingness of things as a rupture: we experience their underlying thingness when objects suddenly no longer comply according to these codes, when they disappoint the expectations we have in them:

[QUOTE] We begin to confront the thingness of objects when they stop working for us: when the drill breaks, when the car stalls, when the windows get filthy. [UNQUOTE]

[When my computer does not boot up,
when the battery of my smartphone is empty and I am
relying on it to find a place I have never been to before,

when my screen cracks,
when I cannot show my slides because the adapter
for the projector is missing,
...)

[QUOTE] when their flow within the circuits of production and distribution, consumption and exhibition, has been arrested, however momentarily. [UNQUOTE] (Brown 4)

But the crumpled paper here is less a rupture than a noise. Although the crumples obstruct the process of objectification, they do not arrest or silence it. The crumpled paper does not /re/sist objectification (the text has not become completely unintelligible), rather it /in/sists on its own significance in the process of objectification; here: of playing its part in how printed dots are disregarded individually in order to become meaningful constellations, signifiers pointing at something beyond themselves: a text. (The crumpled paper plays /along/, making the text it sustains less stable and sound.) The insistence of /things/ produces friction. Things insisting on their thingness demand an increased level of attention, putting to the test the automated and unconscious mechanisms of our reading them. Karl Schawelka refers to this as "frustrated synthesis": the cognitive process of turning sensory information into meaningful objects is impeded, the mind has to work harder to grasp what reality is confronting it with (26).

A thing is both more and less than an object. As Brown notes, things "hover over the threshold between the nameable and unnameable, the figurable and the unfigurable, the identifiable, and the unidentifiable" (Brown 5).

'Object' can be translated as /Objekt/ and /Gegenstand/ into German. (Both words are often used as synonyms (HD). /Gegenstand/ literally means "that which stands against", "that which opposes something" (ibid.). Thus /Gegenstand/ indicates a relationship: some thing opposes (the subject). It is never just by itself. It exists as an opposition. The word 'object' has a slightly different meaning. It derives from the Latin word /objectum/. The prefix /ob-/, translates as "in the way", /iacere/ is 'to throw'; the /object/ is "that which is thrown in my way" ('object'). An /object/ is actively moving, it is a projectile, its movement causes an effect. /To object/ is to actively oppose someone or something, to become a /Gegenstand/ in order to stand against someone or something. While the object is thrown at me and I have no choice but to deal with it, the /Gegenstand/ is

static and calm (although not passive) in its resistance. It does not move, it stands. Immanuel Kant subtly differentiated between /Objekt/ and /Gegenstand/: A /Gegenstand/ exists as an experience, as a product of sensory data. It is not (yet) necessarily /cognized/ by the understanding. An /Objekt/ exists because it has been /re/cognized by the understanding. It is the synthesized /Gegenstand/ (McWherter 157). Looked at this way, a /Gegenstand/ could be regarded as being in between things (the thing-in-itself cannot be known, it lays outside of cognition) and objects (Eisler "Objekt"). For Kant, a /Gegenstand/ is that which is experienced but which is not (yet) meaningful; it is being grasped while it withstands. It can only be grasped /because/ it withstands. The withstanding of the /Gegenstand/, that which stands against the subject in the process of cognition, is its unknowable, unprocessable thingness. Even though this thingness cannot be realized itself, it remains apparent in the opposition it causes.

Brown's idea of a 'thing' could thus very well be understood to mean a /Gegenstand/ in the Kantian sense. However, since my aim is to put my finger more on that which causes the /Gegenstand/ to stand against, and not so much on the subject it is standing against, I will continue to use the word 'thing' in this text. In accordance with Brown's idea of "Thing Theory" and Daniel Miller's notion of /Stuff/, I understand things to be the /stuff/ of everyday life that cannot fully be grasped by our understanding.

When I see the object I do not see the thing. I see what I can /re/cognize in the thing, what it reminds me of. The object is more a reflection of my memory than something outside myself. Daniel Miller notes that objects are significant "precisely because we do not 'see' them. The less we are aware of them, the more powerfully they can determine our expectations by setting the scene and ensuring normative behaviour, without being open to challenge. They determine what takes place to the extent that we are unconscious of their capacity to do so" (/Materiality/ 5). The thing that makes an object recognizable can be experienced but it cannot really be described. The insistence of things and the friction it produces lets them reappear out of oblivion.

Just before Roquentin, the protagonist of Jean-Paul Sartre's /Nausea/, has his famous epiphany over the roots of a chestnut tree and finds "the key to Existence" (129), his objects and words already begin to fray and disintegrate when he sits in a tramway:

[QUOTE] I lean my hand on the seat but pull it back hurriedly: it exists. This thing I'm sitting on, leaning my

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hand on, is called a seat. They made it purposely for people to sit on, they took leather, springs and cloth, they went to work with the idea of making a seat and when they finished, that was what they had made. They carried it here, into this car and the car is now rolling and jolting with its rattling windows, carrying this red thing in its bosom. I murmur: "It's a seat," a little like an exorcism. But the word stays on my lips: it refuses to go and put itself on the thing.[...] Things are divorced from their names. They are there, grotesque, headstrong, gigantic and it seems ridiculous to call them seats or say anything at all about them: I am in the midst of things, nameless things. Alone, without words, defenceless, they surround me, are beneath me, behind me, above me. They demand nothing, they don't impose themselves. [UNQUOTE] (Sartre 125)

Brown writes: "The story of objects asserting themselves as things, then, is the story of a changed relation to the human subject and thus the story of how the thing really names less an object than a particular subject-object relation." (4)

The thing is strange. All I can do is try to /figure/ it out. But things are underwhelming. The friction they cause is not productive, their noise does not make sense. The thing remains absurd. It reveals not itself but a disturbing excess, an indigestible residue. It is a bother, potentially even uncanny (cf. Trigg). The futile action of reaching out in the attempt to objectify it, to pin it down using language, lets it become apparent as a rift: It is identifiable only as that which is not like anything else. It cannot exist as a concept. It is here because I am here struggling with it. Thus, this underwhelming encounter with things refusing to shut up entails a chance of sublimity, a chance to experience the process of realization, of watching oneself recognize. For Kant, the sublime was not the beautiful /per se/, but rather connected to the realization of a "super-sensual capability", which enables an intellectual transcendence of the resistance imposed on us by the harsh and overwhelming physical world. Due to its unfathomable size, the superiority of our environment leads to the realization of our cognitive faculties. This realization is the sublime (Eisler "Erhaben"). Kant exemplified this with the overwhelming experience of standing by the sea and watching the power of the waves. As the subject feels overpowered and helpless, he or she may realize that it is in fact he or she who realizes this overwhelming vastness and inconceivability after all.

I would like to argue that the same realization is possible when the subject is underwhelmed: the absurdity and

2 The Japanese language has a rich vocabulary to grasp this endurance of the underwhelming noise of sheer things. To give just one example: the term /aware/ »is applied to the aspects of nature (or life, or art) that move a susceptible individual to an awareness of the ephemeral beauty of a world in which change is the only constant. His or her reaction may be a resigned melancholy or an awe, or even a measured and accepting pleasure« (Richie 52). See also: Francesco Orlando's extensive study /Obsolete Objects in the Literary Imagination. Ruins, Relics, Rarities, Rubbish, Uninhabited Places, and Hidden Treasures./

3 As a trained typographer, I am intimately aware of the standards of written communication. Typography is the attempt to give language a (reproducible) form. Good typography—in the eyes of many—makes the traces of the work of the typographer invisible: it lowers the noise of the materials of the text. A typographer manipulates this material to communicate ideas effectively. In order to do so, I need to get in touch with those materials of communication: this once meant setting actual, tangible lead characters, today it means to handle digital tools. I think it is fair to say I have what Richard Sennett calls a »material consciousness« for text (120).

unintelligibility of silent and stubborn things, of obsolete objects, is much more easily brushed aside and ignored than the breaking of big waves; nevertheless, small things may cause a similar, albeit much quieter feeling of being lost or impotent. <--2

[when someone spills tea on my laptop,
when the internet connection does not work,
when the power supply fails,
when the server is down,
....]

It may be too bold to claim that a crumpled page has the potential to galvanize us out of self-oblivion. However, its stubbornness strikes me as an extraordinary banality: in this thesis, as in almost any other book, all pages with text on them look roughly the same. They are all printed on the same paper, the layout of the text does not vary. Following typographic standards, this establishes a visual grammar, which helps to orient and focus the reader; to silence the noise of the thing. 'Decluttering' aids to foreground the text and its abstract content. <--3

This abstraction through noise reduction /trajects/ the content; it is not /thrown in my way/, but /across/ ('trans'). My head intuitively turns away from the source of this movement, and I begin to wonder where the meaningful object might strike next. The writing is meant to transcend its substrate. As leaves of paper become pages, they fade out of attention and thus seem to become invisible; the words they contain are thought of as disembodied thought, bodiless effects. Vil┼m Flusser called this--in his opinion "problematic (doubtful)" (50)--attempt to lead the reader's attention by removing distinctions "typification". Without typification, reading would be impossible:

[QUOTE] Something printed is a typical thing, and not a distinctive, incomparable, unique thing. A printed paper is a specimen, one among many examples of one unique thing (e.g., of a manuscript). Something printed is valuable not as a distinctive object (as this singular piece of paper) but as a type. The interesting thing about it is not the production of print (of papers, of printed writing) but the production of the types (of the text). [UNQUOTE] (51)

These crumples here activate and single out a page, hindering its abstraction and thus the abstraction of its content. The crumples re-individualize the page. It is not typical anymore. But no /thing/ is added or taken away. The thing

itself, the paper, has been crumpled; it has been /in-/formed. Flusser points out that "/to inform/ originally meant 'to dig forms into something'." (12) Understood this way, form is not solely abstract and conceptual but realized through a cognitive act of extraction: the effects resulting from the formation of some /thing/ are recognized and foregrounded, the ungraspable thing sustaining them becomes a background-noise. This /in/-formation of the page-paper-thing causes what I have just described as an unproductive friction, an irritation, slightly frustrating the reader's synthesis, their hermeneutical endeavour. The crumples /re-/present the paper. They make apparent that the paper was there all along, a sustaining support, whose silencing through typification makes the meaning of the text possible. These crumples are nothing like Kant's waves. They are not /awesome/ and /terrific/. However, as they disturb the flow of meaning, they might have the potential to reveal the unbridgeable existential gap between the things we encounter and the ideas we recognize in them. Beyond our frustration about things not working the way we want them to, there is a chance to realize how entangled we are in them, that making sense does not come 'naturally'.

The body of digital media cannot be foregrounded by crumpling it like a page. It is even more successfully rendered 'invisible'. In this research project, I sought ways to foreground the sustaining material support of digital devices, and their role in the hermeneutic process. How can their thingness be revealed in the construction of meaning across an interface? The potential emptiness of a screen (or a digital projection) is clearly very different to the emptiness of a sheet of paper. The aim of this thesis is to investigate this difference.

As I know that I cannot crumple digital interfaces as I can crumple a page, I make this futile attempt the focus of my inquiry. I try to be as insisting as the things that sustain meaning. My practice is concerned with the distance between the act of (/in-/)formation and understanding. I approach things that have been /in-/formed to behave as digital machines and look at their effects, the only superficially immaterial /in-/formation they produce. I reflect my own position in this entanglement by actively and often futilely attempting to (re-)insert myself in the ungraspable processes of digital translation. I investigate if Flusser's claim that the "absurd objective world is stronger than the subject's will to inform it" still holds true today, now that with highly advanced and ubiquitous digital interfaces, the literal /in/-formation of the

physical page has become an abstract matter of resolution concerning bits lighting up pixels.

[QUOTE] But as my eyes fell on the pad of white sheets, I was struck by its look and I stayed, pen raised, studying this dazzling paper: so hard and far seeing, so present. The letters I had just inscribed on it were not even dry yet and already they belonged to the past. [...] I had thought out this sentence, at first it had been a small part of myself. Now it was inscribed on the paper, it took sides against me. I didn't recognise it any more. I couldn't conceive it again. It was there, in front of me; in vain for me to trace some sign of its origin. Anyone could have written it. But I... I wasn't sure I wrote it. The letters glistened no longer, they were dry. That had disappeared too; nothing was left but their ephemeral spark. [UNQUOTE] (Sartre 95)

Looking at a sheet of paper through the conceptual lens of digitalization may serve to reveal something about the preconceptions of the observer. I stubbornly resist seeing objects as interchangeable equals--this A on my screen here is not this A ; it is neither the electrical charges stored on my hard disk nor one of the letters you see printed out right now. How come I take the portion of an illuminated white rectangle in my text editing software, the contents of the screen of my e-ink ebook-reader or a PDF-file to be a page? How does this experience change the way I think about the objects sustained by the paper of a page in a book? How come I see that and this A as equals, even though the very /Gegenstand/, the thing sustaining them, has radically changed?

[ON STRUCTURE

This thesis consists of two parts. The first section, titled /THE CONDITION/ is a phenomenological and theoretical questioning of the computer as a thing.
First, (1.1) I /approach/ it metaphorically. I compare computers and their interfaces with other worldly things: ruins (considering the existence of the machine, its resting body, and the expectations and promises it entails), vessels (thinking about function), and windows (reflecting on the notion of digital transparency and contingency). Then, (1.2) I verbally /enter/ the computer. I write about how the Turing machine came to embody and perform language by turning everything into writing and how it itself relies on written structures.

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The space of language is the space between things; language relates things by denoting them but fails to grasp the thing itself. In this first section, I collect ideas and define a set of terms to stake out this ambiguous, inter-textual space as the background for my practice, a room I go on to furnish with things that cannot be put into writing.

I begin the second part, titled /THE CONCERN/, by (2.1) revisiting Mel Bochner's mural "No Thought Exists Without A Sustaining Support", which has had a major influence on my work. I describe how Bochner's work can be understood as making things embody and perform concepts. I then speculate about how his post-conceptual sensibility could be related to the so-called post-digital condition: /Things/ re-emerge as it becomes apparent that there is always a physical remainder that cannot be wholly conceptualized.

I follow by concisely introducing my practice as a series of exercises in grappling with the evasive body of digital media. I describe the conceptual journey that lead to the individual projects, moving from questions and complications on the process of (digital) translation (2.2) and the physical act of /in-/formation (2.3), to interfaces as things (2.4). I regard the results of these exercises to be more than illustrations or materializations of the terminology I establish in the first section; I want them to become extensions of the linguistic inquiry into this thing that I constantly forget is here in front of me.

I include my work as reproductions, consciously regarding this inclusion as an act of writing things as images, of turning what I intend to show as distant things into digital objects once more, before they are printed. The individual pieces appear several times in different forms, to raise questions around the links between them. The physical existence of the reproductions (as things) is what sustains the inter-references between the works and the text that I am interested in.

Theodor Adorno notes that "indirectness can no more be hypostatized than can the poles of subject and object: it is valid only in their constellation. Transmission is transmitted by what it transmits" (N 99). For Walter Benjamin "[i]deas are to objects as constellations are to stars" (O 34). In this way, I view the thesis as a constellation following Adorno and Benjamin's ideas of constellations as a means to break binaries, and so also the idea of self-identicality. Rather than trying to directly identify a thing or situation, (to argue inside a framing structure or

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against it by trying to step out of it) they suggest /encircling/ it. Since language eventually always fails to be completely abstract and objective, because it always--ever so slightly--misses its target, Benjamin and Adorno proposed using its abstracting trajectory to address the thing in question by retracing the multiplicity of its relations. I can only point at the ontology of digital objects, I cannot reduce it to the blueprints of computer chips or images of servers or by printing out binary code as zeros and ones. By associating things and ideas both conceptually and visually (through choices in layout and various numbering systems) I hope to evoke the material and cognitive friction that occurs when things are translated into and out of (digital) objects--the thingly space of (digital) transmedialization. To continue this cross-referential approach, I include smaller pages with reproductions of artworks by other artists and a few found images that resonate with certain passages of the text; the artworks appear as literal screenshots, digital photographs that show how I accessed the documentation of the work online as a digital object.

I conclude the thesis by contextualizing my questioning within the wider debate on the contemporary digital condition, to ask: are we witnessing a /resolution/ of existence?

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overleaf: image depicting a ›fatberg‹ in a London sewer. | The Oxford Dictionaries define a fatberg as »[a] very large mass of solid waste in a sewerage system, consisting especially of congealed fat and personal hygiene products that have been flushed down toilets.« (ONE)

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1
THE CONDITION

1.1 APPROACHING THE COMPUTER

This text was written and is been written using a COMPUTER.

The writing I am conjuring up on the screen in front of me here and now is supported differently than the writing you see on the page in front of you. (Although not so much if you are reading this thesis as a PDF-file.) Even though the text is right there, and despite the fact that I can easily edit it—just now I made the whole text disappear and reappear again by pressing just a few buttons on the keyboard (cmd+A | cmd+X | cmd+V), it was all gone but still in there, somewhere, somehow—it is out of reach and intangible; to edit it is not to manipulate it (from Latin *manipulus* = ›handful‹) (»manipulation«). Text and substrate feel utterly dislodged. The words I see are phantoms (Kittler G 22).

Their appearance is an effect of light passing from the back of the screen through little pixels, actual little things; but as they are too small to me to discern I tend to forget about them. The liquid crystals of the pixels either block the light or let it pass through. Some of this light travels the short distance between the screen and my eyes. When it hits my retina, the light turns into electrical impulses, these impulses travel to my brain, my brain synthesizes and recognizes that the text appearing on the screen exists and means.

> [After Karin Winter got her eyes lasered in 1999 using the newly developed technique called aberrometry in which the distance between the lens and the retina is precisely measured, she had a vision of 23/10. That is 2.3 times better than what is considered average vision. She quickly noticed a downside of being able to see so exceptionally well: she was bothered by having to see the space in between the pixels of her TV set. (Focus)]

I do not know where those electrical signals triggering the light and shadow of the pixels have their precise origin. It must be somewhere right under the keyboard I am typing on.

Jacques Derrida aptly described this inevitable profound ignorance of the material of digital writing as follows:

> I know how to make it work (more or less) but I don't know *how* it works. [...] Not knowing, in this case, is a distinctive trait, one that does not apply with pens or with typewriters either. With pens and typewriters, you think you know *how* it works, how ›it responds.‹ Whereas with computers, even if people know how to use them up to a point, they rarely know, intuitively and

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overleaf: image of an e-waste landfill.

»[T]he profound peace which, like a holy charmed circle, surrounds the ruin, conveys a sense of this constellation: the obscure antagonism which determines the form of all existence--now acting among merely natural forces, now only within psychic life, and now, as in the present case, taking place between nature and matter. This antagonism--although here too it is in disequilibrium--letting one side preponderate as the other sinks into annihilation, nevertheless offers us a quietly abiding image, secure in its form. The aesthetic value of the ruin combines the disharmony, the eternal becoming of the soul struggling against itself, with the formal satisfaction, the firm limitedness of the work of art« (Simmel 384) (TWO)

> without thinking — at any rate, I don't know — *how* the internal demon of the apparatus operates. What rules it obeys. This secret with no mystery frequently marks our dependence in relation to many instruments of technology. We know how to use them and what they are for, without knowing what goes on with them, in them, on their side; and this might give us plenty to think about with regard to our relationship with technology *today* — to the historical newness of this experience. (Derrida 23)

Are there ways to make manifest how this peculiar device in front of me is making the text cling to itself right now — as a thing, not as an abstract concept? Is it possible to find ways to think »without words, on things, with things« (Sartre 130) while they function as digital interfaces, designed to slip the mind? [4]

To do so, I borrowed Martin Heidegger's idea of ›questioning‹ which he explains in the very beginning of *The Question Concerning Technology*:

> In what follows we shall be *questioning* concerning technology. Questioning builds a way. We would be advised, therefore, above all to pay heed to the way, and not to fix our attention on isolated sentences and topics. The way is a way of thinking. All ways of thinking, more or less perceptible, lead through language in a manner that is extraordinary. (Heidegger Q 3)

4 Some digital effects are designed to alert a user, to intrude upon his or her mind. However, I would like to argue that—even in such cases—it is not the body of the thing that sustains this effect that intrudes, but its functioning as an interface.

Heidegger's ›way‹ leads into the metaphysical. In his attempt to grasp the essence of technology, he *played* with words, he used language like a material. Heidegger bent and twisted language in ways that are extraordinarily hard and sometimes even impossible to translate into English. He alienated language to make it do something: the aim of his essay was not first and foremost to arrive at the conclusion that the essence of technology lays in the *Gestell*, but in the ›exemplification‹ of his way of thinking *through* language. (I explain the idea of *Gestell* in this annotation >5.) Through this thesis, and in my practice, I aim to

5 Albert Borgmann regards William Lovitt's 1977 translation of /Gestell/ as the neologism ›enframing‹ to be ›unfortunate‹ (Borgmann BCH 428). He recommends the word ›framework‹, which still does not quite capture the meaning of /Gestell/: the German prefix /Ge-/ forms a collective noun. If /Ge-/ is followed by a verb form, it denotes the result of a completed passive action.
— /Gebäck/, from /backen/ = ›to bake‹, literally means ›that which has been baked‹, ›pastries‹, ›biscuits‹, etc.
— /Gebirge/, from /bergen/ = ›to retrieve‹, also ›to salvage‹, literally means ›that which has been retrieved‹, ›the mountains‹ (Heidegger also frequently uses /verbergen/ = ›conceal‹ and /entbergen/ = ›to reveal‹).
Heidegger used this word form to point at the force that is causing the addressed action. He calls this force »that which gathers« (Heidegger Q 19).
/Gebirge/ thus is read as »that which causes the gathering of the mountains«, »that which retrieves / reveals the mountains«. >>>

question in order to build a way (or to span a field) that leads away from language, away from the metaphysical, towards the silent and aloof physical things sustaining (digital) objects, and thus, finally, towards a confrontation with how it is human *re*cognition that makes those things meaningful. Bill Brown writes that things »lie beyond the grid of intelligibility the way mere things lie outside the grid of museal exhibition, outside the order of objects.« As a »relief from ideas (what's encountered as opposed to what's thought)«, the Thing names »that enigma that can only be encircled and which the object (by its presence) necessarily negates.« With this thesis, I try to encircle the thingness of computers with a constellation of words, images and artifacts.

After visually introducing my practical work, I will now proceed in this encircling by approaching the computer with three metaphors. Metaphors are figures of speech and thought, the attempt to describe the unknown through a figure that is known. Metaphors are therefore often used to explain the experience of cultural artefacts by comparing them with natural objects (Krysmanski 1). I point toward the thingness of computers by comparing them to other man-made objects: ruins, vessels, and windows, using these metaphors as ways of thinking around the habitualized language of digital objects. Wendy Chun notes that »metaphors dominate user interfaces«, because they »make abstract computer tasks familiar, concrete, and easy to grasp, since through them we allegedly port already existing knowledge to new tasks.« (Chun P 57) Digital objects are described variously as ›folders‹, ›waste bins‹, ›desktops‹, ›inboxes‹, or ›clipboards‹, while the further abstracted idea of the internet and data storage is referred to as a ›cloud‹. Because »[c]omputers, understood as universal machines, stand in for substitution itself« (ibid.), they are perceived to be empty, created not to exist as independent objects but for their function, a (metaphorical) performance of likeness. There always needs to be *this other thing* that is not the computer that can be substituted by turning it into a codable metaphor that acts to fill the computer's seemingly abstract functions with comprehensible meaning. I aim to use these three metaphors to move away from the familiar and conventional language of the computer, to expose the *stuff* that sustains the alleged magic of its

>>> – /Gestell/, from /stellen/ = ›to put‹, ›to set‹ (in the sense of putting something so it stands, Lovitt translates it as ›setting-upon‹), literally means »that which has been put to stand«, ›rack‹, ›frame(work)‹, ›stand‹. Heidegger defines the essence of technology as a mindset that ›enframes‹ all things, causing us to regard them as resources (/Bestand/, from /stehen/ = ›to stand‹, literally meaning ›that which stands‹), is meant to be »that, which can be exploited (because it is set to stand)«. Technology challenges all things. It sets (/stellen/) them so they stand (/stehen/) as resources (/Bestand/), ready to be summoned and exploited (/bestellen/, which not only translates as›to order (goods)‹, ›to summon‹, but also as ›to cultivate‹ (land, a field), ›to till‹). Heidegger's /Gestell/, even though deduced painstakingly by alienating everyday language, is not that different from Flusser's idea of ›typification‹. Both Heidegger and Flusser shared the concern that such an abstracting mindset might pose the biggest threat to humanity (cf. Borgmann BCH 430, and Flusser 52).

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surface effects, and to question its ungraspable thingness: the gap between the thing and the objects that we habitually recognize. If, as Mel Bochner put it »language is not transparent«, is it possible to use its opacity to approach the ungraspability of digital objects?

1. 1. 1 THE RUIN

›Ruining‹ my computer, crumpling it in a metal crusher, may break the device, but would it destroy this text within it? The text might physically still remain *in there* — somehow, somewhere — stored as magnetic or electrical charges, but without a working interface to get it *out of there* one could just as well consider it to be lost. Crushing the materiality of the computer would render it a useless thing and consequently silence the text. [6]

A computer does not slowly age, wither away and wear out like other everyday objects. Digital death is sudden, sharp and relentless. If it ceases to function, a computer immediately turns into an aloof, awkward box, an empty case. It might become ›slower‹ over time when new software demands more resources, yet this is not a sign of the machine's gradual demise — digital bits do not rust or burn out like a light bulb — but of changed expectations (and probably of planned obsolescence.) Today, a computer is often replaced even before it stops working (Spinks). Still full of unwanted potential it then becomes a kind of ruin, catching dust on a shelf or, shipped out of sight, wasting away in an e-waste dump (Vidal, Parikka 142).

As an obsolete object, a crumpled laptop or a discarded smartphone could be interesting: a broken interface tells a story about what its now deranged physical make-up once made possible. A silenced digital device may raise questions about the reasons for its abandonment. The uselessness of unwanted electronic devices can be understood as a foil of their former potential (cf. Orlando 5f). They are *strange* objects.

Indeed, there is an ever growing interest in media archeology — the study of these ruins, of the obsolescent devices and the practices and forms of communication they formerly established. Lori Emerson and Matthew Kirschenbaum set up labs with old computer equipment to recreate and preserve, and thus also understand, how the peculiarities of these systems informed how writers used them. Their interest grew out of practical questions

6 In /Mechanisms. New Media and the Forensic Imagination/ Matthew Kirschenbaum examines the reading and writing mechanism of hard disks. He explains how they cause physical manifestations of data, /traces/, that, despite being inaccessible to human senses, are not at all immaterial. Looking at the techniques of computer forensics (»the activity of recovering or retrieving electronic data, analying and interpreting it for its evidentiary value, and preserving the integrity of the data« [M 46]) he notes that the »magnetic inscription is a temporal as well as a planographic intervention, whereby even data that has been overwritten continues to resonate as a result of the ongoing oscillation of the magnetic field«. (M 66) Computer forensics can often access this material ›shadow‹ of bits and thus challenge the idea of the immateriality of data.

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around the preservation of digital texts: if handwritten manuscripts are kept as documents of the development of a text, would it then not also be useful to keep the computer systems authors used to write digital texts? (Emerson is head of the *Media Archaeology Lab*, Kirschenbaum is director of the *Deena Larsen Collection*.) How to ensure digital artworks will still be accessible in the future? (cf. Buckland, »What is a document?«)

In a recent exhibition on Flusser's influence on the arts, much care was taken to recreate a computer set-up one might have used to read his text »Schrift. Hat Schreiben eine Zukunft?« (translated into English in 2011 as »Does Writing Have a Future«). The essay was first published in 1987 exclusively as a digital text stored on a floppy disk (*Bodenlos.*).

Flusser chose this form to reflect the matter of concern of the text: The software on the disk that renders it readable for humans eyes could also be used to edit it; and as Flusser regarded it to be in flux, he encouraged his readers to do so. (Berning 134.48) The first printed version of the text came out in 1992. However, whereas the book is still widely available, accessing the digitally encoded version now requires computer historical skills and access to outdated equipment. The text on the disk is no longer in flux but rather entombed.

Flusser's text file could thus be regarded as an example showing how the persistent belief that ideas can be ›saved‹ untethered from a material substrate will likely turn out to be a wishful fantasy. The digital storage devices which are metaphorically described as ›memory‹ often reliably become incompatible with newer equipment. Kirschenbaum's and Emerson's media labs are attempts to find practical frameworks to ensure the devices used to write, store and display digital data are preserved in order to prevent them from becoming silent ruins. By maintaining obsolescent computer systems as functional historical artifacts, they help to keep digital information alive as memory by keeping it accessible.

Another strand of media archeology is concerned with the »deep time« of media — the attempt to understand how all contemporary digital media incorporate thousands of years of cultural development (Siegfried Zielinski, Wolfgang Ernst) and how the devices that propagate a sense of acceleration are made from unearthed archaic materials formed in geological processes over the course of millions of years (Jussi Parikka, Erkki Huhtamo). In the appendix to his book »A Geology of Media«, titled »Zombie Media«, Jussi Parikka, together with the artist and researcher Garnet Hertz, proposes media archeology as an art methodology, an »alternative archaeology of tinkering, remixing, and collage« that »would not start from Duchamp and others but from opening up the technological gadget, the screen, and the system.« (151) They do believe that »media never die: they decay, rot, reform, remix, and get historicized, reinterpreted, and collected. They either stay as a residue in the soil and as toxic living dead media or are reappropriated through artistic tinkering

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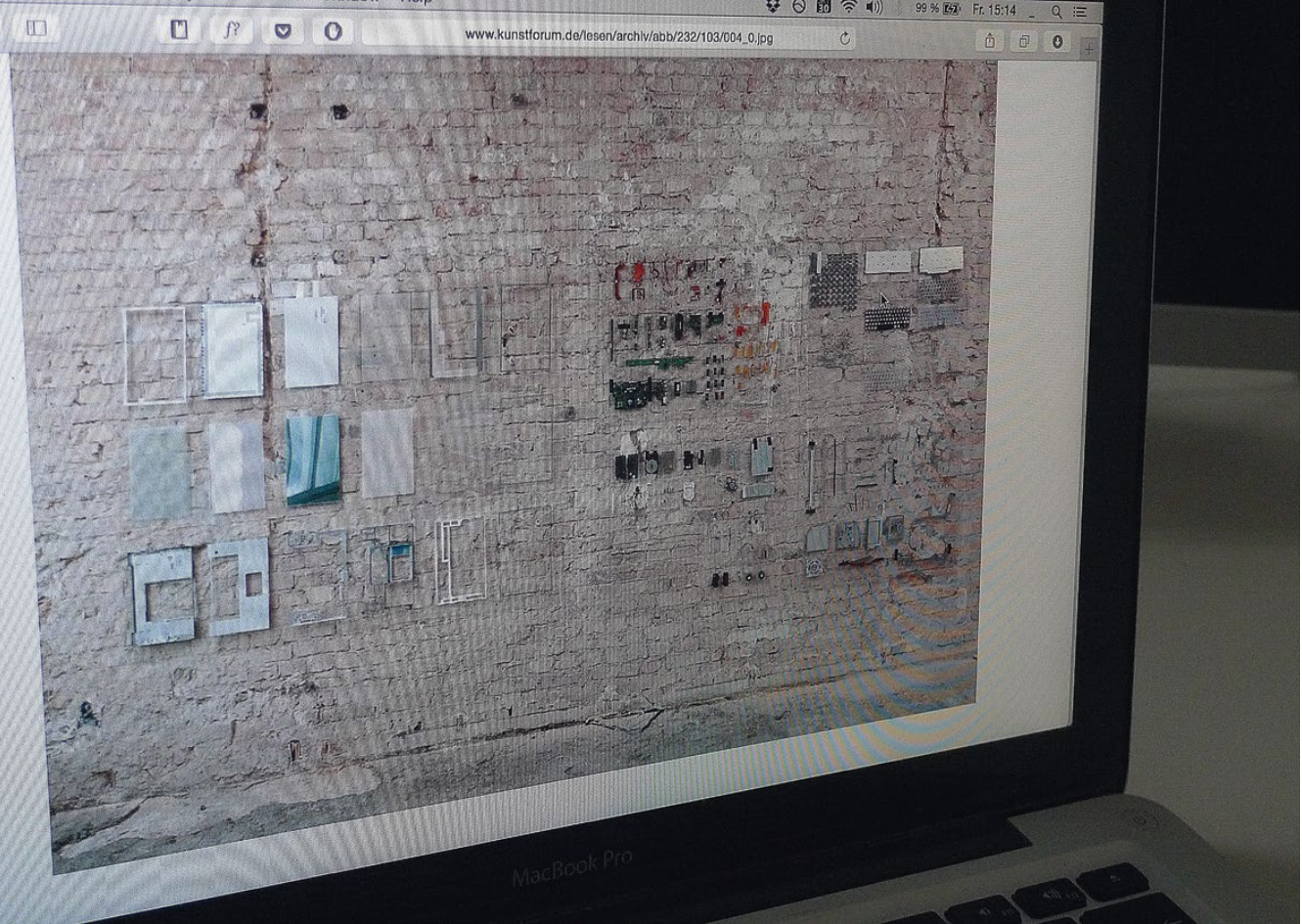
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MacBook Pro

overleaf: installation shot of Henrik Olesen's /I Do Not Go to Work Today. I Don't Think I Go Tomorrow/ (2010)
For this series of works, Olesen disassembled various digital tools: his laptop computer, a digital camera and a photo printer. He neatly arranged the components on large acrylic and chipboard sheets in an anatomical manner. Each single thing the device consists of becomes visible, revealing interdependencies between pieces, but mainly just leaving the viewer puzzled how all those parts connect to become functional. Olesen's analytic disassembly turns the devices into ruins: As the material body that sustains their function is revealed, this function is lost.
The title ironically reflects how deeply dependent Olesen is on the operation of these devices. Indeed, most work today will at some level involve handling digital data. The act of unpacking the device one relies on could thus be understood as a slight subversion, a reclaiming of one's capability to make decisions, nevertheless. (b)

methodologies.« (153) Parikka and Hertz regard this emancipation through appropriation of the physical ruins of digital black boxes as a way to gain a deeper understanding of how these devices are enmeshed with human subjectivity; how they manage and inform how we relate to the world.

Looking at a broken computer, I predominantly feel the absence of its performance that I am used to. It is a feeling of a disappointed expectation. I use computers because of the digital objects they conjure: this text here, the app on my smartphone that helps me to get home, the EPUBs of the papers I quote from, videos of kittens, my music files… [7]

A broken computer severs me from such conjurings. A chair with one of its legs missing or a hammer without a handle are obsolete in a very different way. They lack the inherent emptiness of a computer, which, if it functions, becomes a stage on which bits act out information, broadcasting meaning. What I realize are the effects of this performance. They are emitted by interfaces that my senses are compatible with and have become habituated to. What factually, physically, causes those effects remains hidden from my comprehension in the black box of the computer.

> In a promotional video, Apple's Chief Design Officer Jonathan Ives introduced the original iPad in 2010 by stating: »You know, it is true: When something exceeds your ability to understand how it works it sort of becomes magical—and that is exactly what the iPad is« (Apple, 0:00-0:12). Maybe this slight attenuation of the computer's magic pinpoints the contemporary phenomenological condition of the computer's »secret with no mystery«: we know that it is not magical, but we cannot but experience it as if it were.

A broken computer does not reveal how this black box works; there is no way to pry it open. However, as it confronts me with the suddenly apparent physical excess of its broken emptiness, I may grasp the contingent nature of digital objects (cf.

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7 For Yuk Hui, digital objects are necessarily networked, he defines them as »objects on the Web, such as YouTube videos, Facebook profiles, Flickr images, and so forth, that are composed of data and formalized by schemes or ontologies that one can generalize as metadata.« (380) He notes that the internet »is acting both as an interface between users and digital objects and as a world in which these digital objects conceal and reveal—in both physical and metaphysical terms.« (381)
Jannis Kallinikos, Aleksi Aaltonen, and Attila Marton »subsume under the category of digital objects all digital technologies and devices and digital cultural artifacts such as music, video or image.« (par. 3); they define the main differences of digital objects from physical objects and other cultural records to be their immanent pliability (the possibility to edit and modify them), interactivity (»offering alternative pathways along which human agents can activate functions embedded in the object or explore the arrangements of information items underlying it and the services it mediates« (par. 8)), openness (the possibility to access and to modify them by means of other digital objects) and distribution (they are »seldom contained within a single source or institution« (par. 10).) I understand digital objects as synthesized, discerned effects caused by computers.

Kallinikos, Aaltonen, Marton, par. 8), the vast distance between what I have come to desire and rely on and this physical thing effecting it: I may realize my dependence on its function and the physical integrity sustaining its ›magic‹. A fall from grace is fatal for digital devices; their ›magic‹ quickly dissipates. This underwhelming and frustrating encounter evokes the existential rift that the fully functioning interface is constantly bridging. *Left to my own devices*, I may realize that all is not lost, that no computer system failure can take away my being here, and my constant struggle to make sense — yet. I am all tangled up but independent; I am independent not because I am superior, but because I am impotent.

1. 1. 2 THE VESSEL

The objectness and the function of chairs (Arendt 137), chalices (Heidegger Q 6), jugs (Heidegger T 164), and hammers (Heidegger B 64) is directly grounded in the formation of the material they are made of. Like the paper page, it is manifest and evident. The objectness of a computer, on the other hand, is in my opinion commonly regarded to be a necessary evil, as a computer — to refer to Flusser's idea of ›typification‹ once more — is not interesting for being a distinct object in itself, but for its potential to embody this certain contingency that I have just tried to describe: the possibility to create and recreate infinitely different digital objects. A computer rather functions as an interchangeable container for fluid effects: While the appearance of the words of this .txt-file would change if I transferred it to other computers of other dimensions, the abstract context of the text would stay unchanged. I have learned to trust that the machines do not lose words in translation.

Even though many people have a fond relationship to their devices (cf. Chatfield: »The Most Intimate Relationship In Your Life: Your Smartphone«), the computer's ability to turn data into experiences is usually regarded to be of much higher value than the substitutable thing holding and presenting this data. [8] An iPad is an iPad is a computer... However, no matter how exchangeable, the individual computer is not at all insubstantial. Every computer is a material manifestation of the mathematical model of the universal

8 For the book /The Comfort of Things/ the anthropologists Daniel Miller and Fiona Parrot conducted extensive interviews with people living in an ›ordinary‹ street in south London. Visiting their homes, they tried to understand how things mirror and inform how people express who they are, and how they use them to relate to others. Miller states that the book »grew out of a desire to demonstrate that the humanity of people we encountered [...] could be revealed by their material possessions.« (300) The primary research was completed in Sept 2005 (ibid.)—thus Miller and Parrot just missed the rise of smartphones and social media (a topic Miller is now researching). However, in Portrait 6, »The Aboriginal Laptop«, we get to know Malcolm, who, constantly moving between Australia and the UK, is most at home in the order of his computer: >>>

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Turing machine, a machine that »when fed with the instructions of any other machine, can effectively imitate it« (Dyson 5; cf. Kittler S). This abstract model exists as a concept and thus does not itself presuppose any concrete material instantiation. But without a material presence, it cannot be made to act. Stuff needs to be *in*formed to become functional as a receptacle for bits. [9]

Apart from the chips that act like Turing machines, a modern computer, a smartphone for example, contains hundreds of components and a multitude of materials (Rohrig; Brunning). The embodiment of the machine is usually embedded into a complex system of sensors and other interfaces that either feed it with data or emit the results of its calculations in translated form (Ince 5f). The surface of a computer and the ways in and out of its black box are a concern of engineering and design, an issue of furnishing what is between me, the user (or between another computer), and the black box which approximates a universal Turing machine.

Computers fundamentally rely on what Philip E. Agre defines as the ›digital abstraction‹, the translation of physical signals or *things* into clearly distinguishable binary quantities (90ff). Jean-Francois Blanchette notes that theoretically anything from »Tinker Toys to hydraulic valves« could function as a bit. »[A]s long as a material can support the basic operations of the

>>> »Malcolm is a digital man to the core. But he has become one not because of any particular technological interest or predilection towards the latest gimmicks and possibilities. What he relates to and cultivates is nothing to do with the mechanical quality of the thing. It comes from his discovery that the laptop can facilitate the quality of order out of which he has built his relationship to people, and most especially his relationship to himself. [...] For Malcolm, the emergence of the digital resolves his basic contradiction of materiality. How can he, at one and the same time, both keep things and dispense with them as objects? Digital media compress all the sensual objects of the world and reduce them to an other-worldly domain, where they remain a virtual presence. But that other world has its own order and aesthetics. It is not merely an alternative medium for the creation of self-archiving. Digital media creates its own sensual field, of text complemented by visual materials and sound. It can respect the larger integrity of connections between the media it incorporates. « (68)

9 Turing himself famously illustrated the mode of operation of this machine using the metaphor of a »› tape ‹ (the analogue of paper) running through it, and divided into sections (called › squares ‹) each capable of bearing a › symbol ‹. « The symbols are written or erased, one at the time, by a computer (for example by a person), according to a fixed table of rules (the programme)« (231). In this manner, tasks can be divided into smallest steps and expressed as an executable algorithm. Joseph Weizenbaum resorted to toilet paper and black and white stones to explain the workings of the machine (51f) –>IMAGE (A). The first published description of a computer using the stored program concept (cf. Dyson 78), John von Neumann's 1945 »First Draft of a Report on the EDVAC«, stresses that it requires a physical representation of bits in order to operate: »Instructions must be given in some form which the device can sense: Punched into a system of punch cards or on teletype tape, magnetically impressed on steel tape or wire, photographically impressed on motion picture film, wired into one or more fixed or exchangeable plug boards—this list being by no means necessarily complete« (von Neumann 1. 2).

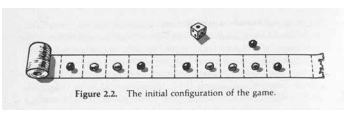

Figure 2.2. The initial configuration of the game.

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digital abstraction, it can be used as the basis for a computing system« (11). Instead of Tinker Toys, a modern computing device usually embodies the bits it is computing with as a discrete presence or absence of electrons. Bits are »represented by an electrical voltage or current pulse, or by the electrical state of a flip-flop circuit.« (»Bit«)

To make the chips of a modern computer, silicon is *in*formed to become a framework, a realm of pure mathematical abstraction in which the »distinction between numbers that *mean* things and numbers that *do* things« (Dyson ix) is dissolved. Bits are not called into existence to just self-sufficiently *be*, but only to *do* something; they are regarded as bodiless signifiers, their substance is insignificant to the mathematical model, they mediate and ›flow‹. The material reality of a computer, its thingness, is built around this compelling mathematical abstraction. It is a complex enclosure of empty space that contains and conducts electrons.

A computer is a vessel.

Electrons pour into the computer and pulse through its chips at ever increasing frequencies. With every beat the Turing machine reads a symbol, a bit, an electrical state, and acts according to the instructions of the program. It either erases and rewrites it, by changing an electrical state, or interprets it as an indicator to look at another symbol, another electrical state, someplace else. In the process, electrons are channeled and guided through funnels, are contained in bulges (as ›memory‹), or are poured out again, sending an impulse to the liquid crystals in the screen, telling the speaker to produce a sound, ordering the hard disk to translate a current into a magnetic charge, or regulating the fan so that the computer does not overheat...

Examining a jug as a prototypical thing, Heidegger concluded that the ›essence‹ of the jug, as of things in general, is its *Geschenk* (T 164). Albert Hofstadter's translation of *Geschenk* as ›gift‹ is somewhat deficient: the word stems from the verb *schenken* which indeed only translates as »to make a gift«. However, it contains, like a residue, an older etymological layer that refers to the act of pouring, which is still present in the noun *Schenke*, an old-fashioned word for ›tavern‹, ›inn‹, ›pub‹, for »a place where drinks are poured«, or the common verbs *einschenken* and *ausschenken* which both only relate to the act of »pouring a drink«. The act of welcoming someone by giving her or him a drink is supposed to be the reason for this shift in meaning (»schenken«). *Schenken* — in the way Heidegger used it — thus is not just the act of giving, but also implies pouring (a drink). The German word for ›the outpouring‹, which Heidegger employed to define the function of the jug, is *Guss*. The *Guss* is what the jug is capable of. Although the verb *gießen*, from which *Guss* stems, is the clearest translation of ›to pour‹, *schenken* — the way Heidegger uses it — has a stronger

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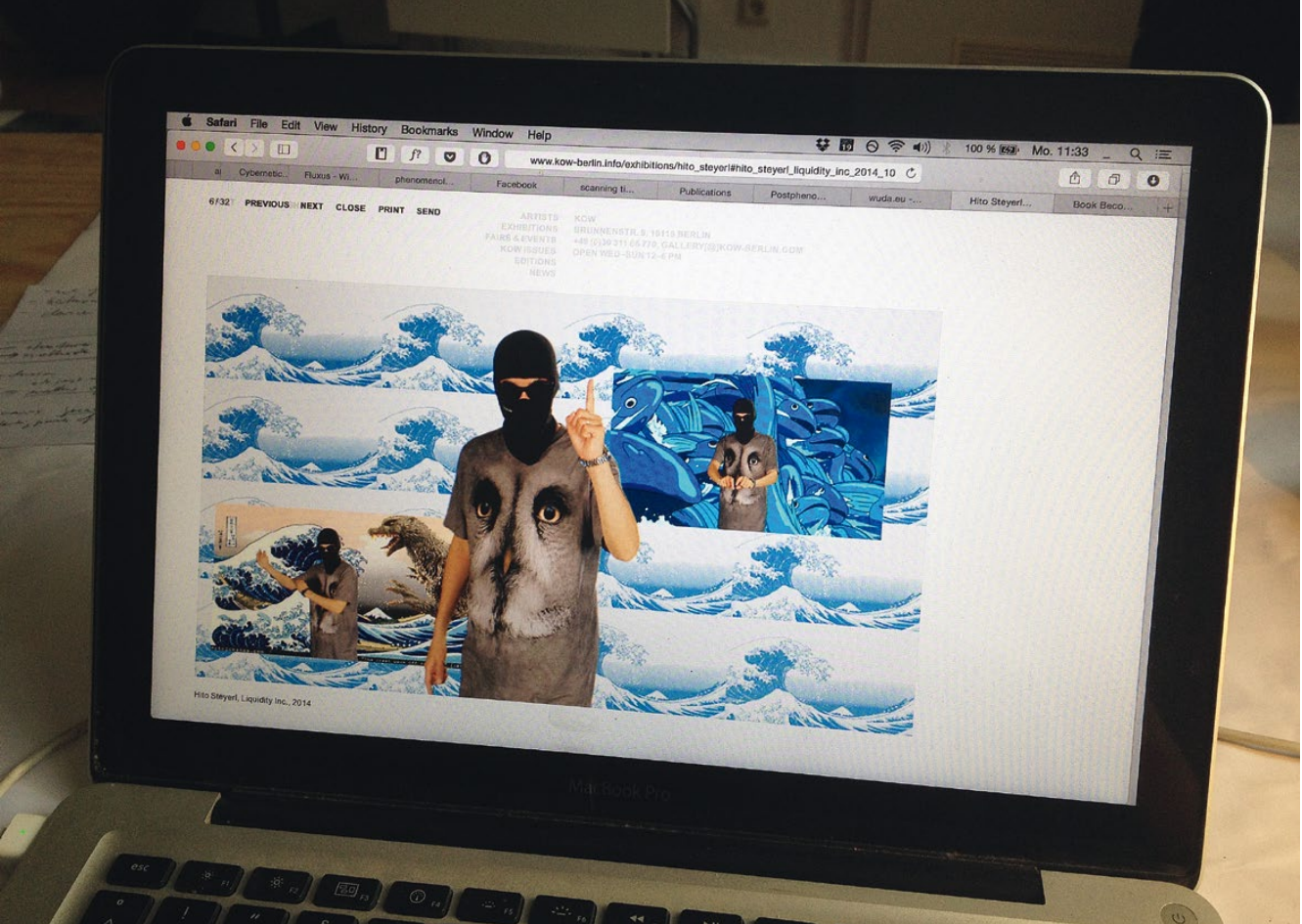
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OPEN WED–SUN 12–6 PM
Hito Steyerl, Liquidity Inc., 2014

overleaf: Still from Hito Steyerl's /Liquidity Inc./ (digital video, 30min. 2014)
Hito Steyerl's experimental film begins with an inspirational quote from Bruce Lee: »Empty your mind, be formless, shapeless like water, if you put water in the cup it becomes the cup, you put water into a bottle and it becomes the bottle, you put it into a teapot, it becomes the teapot. Now water can flow or it can crash. Be water my friend.« Steyerl uses the contemporary aesthetics of graphical user interfaces to evoke the changed status of objects: they are no longer solid and fixed points to position oneself amongst, but increasingly considered as fluid realities, demanding humans to respond fluidly as well. (c)

implication that someone is actively pouring (and giving): *ausgießen* is simply »to pour out something«, also »to discard liquid«, *ausschenken* is ›to pour [a drink]‹ (in order) ›to serve‹; *gießen* thus emphasizes that which is poured, not who or what is pouring. For Heidegger the *Guss* is passive, it is that which the jug holds and which can be poured out. The *Geschenk*, literally »that which has been given / poured«, is that which is — actively — gathering together to bring the jug into being as a jug, that which thus enables the jugs potential to pour, or to give the *Guss*. For Heidegger this gathering and uniting is the essence of all things.

Just as liquids can be poured from one container to another, the bits that cause the existence of digital objects can be fluidly exchanged between different computers. So if a computer could be understood as a vessel, and its *Guss*, its outpouring, as the effects caused by the electrons pulsing in and through and out of the black box it embodies, then, with Heidegger, the essence of the thing that a computer is, its *Geschenk*, would be that which gathers and unites the metaphysical idea of the Turing machine with the human ingenuity realizing it, using materials extracted from the earth. 10

Geschenk, like *Gestell* (see 5), is a collective noun. It denotes the outcome of a completed passive action: something has been done by someone or something, resulting in the presence of the signified thing. By pointing at the result of a (transformative) action, the word names this action; it does not, however, reveal who or what was acting. Yet, as the signified thing reveals itself to be a result of the named action, it indirectly refers to the forces that have caused its existence. Heidegger used this as a way into the metaphysical: in what could be understood as ontological forensics, he tried to verbally grasp the forces that bring things into being by *retracing* how these forces cause the becoming of things; he named and described them by looking at being as completed becoming, as »that which has been been«. Things, according to Heidegger, are not at all as fixed and passive as they might seem. Rather, he regards them to be consequences of constant becoming, gathering, and dispersing. This approach very much resonates with Walter Benjamin's idea of the »language of things« (Benjamin S), which Hito Steyerl refers to in her essay »A Thing Like You And Me« as follows:

> In this perspective, a thing is never just an object, but a fossil in which a constellation of forces is petrified. Things are never just inert objects, passive items, or lifeless shucks, but consist of tensions, forces, hidden powers, all being constantly exchanged. While this opinion borders on magical thought, according to which things are invested with super-

10 The outpouring of digital devices requires much more than shaping clay into a jug: To produce one e-reader, approximately thirty-three pounds of minerals have to be extracted (Goleman and Norris; figure from 2011); a study found that many rare earths necessary to manufacture smart devices are not substitutable—there is as yet no answer as to what to do when natural resources will be depleted (Graedel et al.).

> natural powers, it is also a classical materialist take. Because the commodity, too, is understood not as a simple object, but a condensation of social forces. (Steyerl T)

Bruno Latour describes this in yet another way: to dissolve the rigidity of the subject-object binary, he stresses how both actively shape each other by acting upon each other. He regards them as equal ›actants‹. The acting object (which could be understood as the resisting or insisting object, the noncompliant, crumpled page, or the jug holding and giving the outpouring), has no fixed and rigid existence but is rather, as for Heidegger and Benjamin, constantly shaped through its interactions and dependencies. It only exists because it is embedded in a fluid network of relations to other (human and non-human) objects, because it is being »gathered« (cf. Latour C 75).

Thus a computer can be understood as a manifestation of a thought, a precipitation of an idea or in other words, still: a constellation of the forces that bring it into existence. Just as it does not seem to matter from which kind of container a drink is poured, the computer is regarded to be a supposedly interchangeable and thus objective vessel. Its *outpouring* is caused by bits whose physical existence is generally considered to be insignificant. But how can something be poured if there is no thing to contain it? Who is pouring, and why?

1.1.3 THE WINDOW

Graphical user interfaces have ›windows‹ that are made from code. They are made to be *like* windows but they cannot be the thing that a window is, the thing that cannot be fully grasped by language. Microsoft's operating system ›Windows‹ may be the most well-known play on this metaphor. [11]

Windows are *peculiar* things. They frame a sheet of glass, which thanks to its thingness, its existence as a solid thing, shields me from the outside world, muffling sound, keeping out the wind and cold; and yet, due to its transparency, I can look through the pane of the window as if it was not there at all. My gaze may pass, but my hands cannot. The light shining through the glass into this transparently enclosed inside hits my eyes; I see whatever reflected or emitted it, but I am separated from it.

For some years glass has been used again in computer displays after it had disappeared almost completely when the curved cathode ray tube monitors were superseded by flat, glassless and predominantly matte LCD screens in the mid-2000s (Simmons). As multi-touch devices such as smartphones and tablet computers

11 However, the company was not the first to implement the visual language of the window into a graphical user interface. Xerox did so first in 1973 (Xerox Alto), followed by Apple in 1983 (Lisa). The first version on Microsoft Windows came out in 1985 (Reimer).

became a prevalent way in which to interact with digital objects, users quickly got used to do so by tapping, pinching or swiping on the glass that now covers the display. This glass is a substrate for a transparent coating used to measure where it is touched, to digitize touch (Brunning). The same technique is used in the trackpad on the Apple MacBook Pro I am writing this text on; it is covered by glass, too (Macari). To match the glossy aesthetics of smart handheld devices, glass panes now also often cover the previously matte screens. The light emitted by the screen on which I see the shadowy letters I type passes through a pane of glass, just like the sunlight passes the window of my studio.

However, when I look at the writing on the screen in front of me, I do not look into an outside world. When my computer is on, the screen becomes an ever-changing surface that grasps my attention; there is no depth, no ›beyond‹ the screen. Still, it carries the implication (and hope) that there, within the confines of this rectangle, lay unlimited possibilities made accessible to me: a window of opportunity. But when the screen is not working, when its light is turned off, the glass of the display instantaneously becomes a window that directly faces a dark wall; it turns into a black mirror. [12] All I can recognize in this sudden darkness are the reflections of things and of myself; as if I was trying to look into the dark night through a window from a well-lit room.

Jonathan Crary identifies a »transitional moment that happens when one shuts off an apparatus after having been immersed in any televisual or digital ambience for an extended period. There is a brief interval *before* the world fully recomposes itself into its unthought and unseen familiarity. It is an instant of disorientation when one's immediate surroundings [...] seem both vague and oppressive in their time-worn materiality, their heaviness, their vulnerability to dilapidation, but also their inflexible resistance to being clicked away in an instant. One has the fleeting intuition of the disparity between one's sense of limitless electronic connectedness and the enduring constraints of embodiment and physical finitude« (»24/7« 88).

This brief moment of being lost is another occasion in which the rift between objects and things becomes abruptly palpable: I continue to exist in space and time — but the context of this existence seems radically altered. I no longer observe mediated objects from a safe distance, through a window; I am confronted with their thingly actuality. This changed environment requires another set of skills and other ways of looking. The noticeable shift between these cognitive states, from one habitualized way of

12 »Black Mirror« is the name of a song by Arcade Fire from their 2007 album / Neon Bible/ and a BBC TV series created by Charlie Brooker. Both deal with this ambiguity of computer displays and the influence of digital devices on society in general. The term »black mirror« is another name for a »Claude glass«, a small, usually slightly convex mirror with a tinted surface. Named after the French landscape painter Claude Lorrain, it was widely used in the late eighteenth and early nineteenth century by artists and spectators of landscape to make tonal values and areas of light and shade visible (Maillet).

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recognizing to another, is not effortless. In this fleeting moment of reorientation I might catch myself grasping for hold. I might realize how the objects that I require to be stable external entities — stars I can situate myself among — are there because I am actively *re*-cognizing them; I can realize them because I have come to understand them; I make them into objects by positioning myself, by cognitively distancing myself from them. A window could be understood as a manifestation of this cognitive process of distancing. It physically sustains a distance; it is an objectification device.

Oily fingermarks and smudges on the glossy glass, as well as cracked displays, serve as reminders of the fact that even ›smart devices‹ are exposed to what Hannah Arendt described as »the voracious needs and wants of their living makers and users« (137). Objects, she argues »have the function of stabilizing human life, and their objectivity lies in the fact that [...] men, their ever-changing nature notwithstanding, can retrieve their sameness, that is, their identity, by being related to the same chair and the same table.« (ibid.) She concludes:

> Only we who have erected the objectivity of a world of our own from what nature gives us, who have built it into the environment of nature so that we are protected from her, can look upon nature as something ›objective.‹ Without a world between men and nature, there is eternal movement, but no objectivity. (ibid.)

The now ubiquitous digital windows sustain an even greater objectivity than the objects Arendt refers to. The further they appear to be detached from a physical substrate, the closer the object seems to my thinking, to become conceptual. At the same time, through this distancing and because of their interactive nature, the objects on the other side of the glass seem no longer to be completely severed from me. I have come to believe that I have the power to conjure these digital objects into and out of existence, to call up whatever I desire to see. (At least I feel this way until the battery dies and I see my own real-world reflection again.) [13]

Instead of having to deal with the harsh reality of inexorable things, computers are believed to create a reality in which one can access, manage and control things by means of seemingly disembodied information. Just like windows, computers suggest that there is an outside world that can be observed from a safe distance. On a practical level, with the ubiquity of computers, digital objects are treated and used as if they were conceptual entities every day; they have become functionally immaterial. Now, the move from considering computers as single entities to

13 Sometimes, I might also realize how the limits of this alleged freedom are the limits of the graphical interfaces I grew habituated to (cf. Chun H). Lori Emerson stresses how the frame of the graphical interface does not just enable but also restrict human agency; she argues that they necessarily entail an ›ideology of the user-friendly.‹ (47)

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EIZO

overleaf: still from Jon Rafman's /Still Life (Betamale)/ (digital video, 4min54sec. 2013) (d)

understanding them as nodes in a vast network consolidates the idea that the romantic wish to merge the imagined and the real has become a reality:

In his 2013 film *Still Life (Betamale)* Jon Rafman examines this romantic gaze through digital windows. A digitally distorted voice tells us: »You see the things that were inside you. This is the womb, the original site of the imagination. You do not move your eyes from the screen, you have become invisible« (0:32). The film is a relentless stream of disturbing images and short clips that Rafman found online, mostly on the website 4chan.org, an English language imageboard on which users post anonymously (Rafman SL; 4chan). He combined these images with ethereal electronic music by Oneohtrix Point Never and a spoken text reflecting this contemporary state of cognitive-computational entanglement. The images and videos are a digital curdling of bizarre desires. Their digitality is a prerequisite of

how they came into being and how they exist. They are puzzling explications of an endless, obsessive stream of consciousness, captured fragments of the weird visual overload of obsessive computer users. There are many images of revoltingly filthy computer equipment; others show people in animal costumes, more or less erotic 8-bit manga animations, a smiling cartoon bunny laying on his back, lifting up his legs, presenting his anus; there are more people in costumes posing in front of the camera; later still, more manga fetish fantasies, and more images of filthy computer equipment, now layered on top of each other, partially transparent and seen in fast succession, too fast to really grasp.

In this short but challenging piece, Rafman encapsulates what could be understood as the digital human condition. The film pinpoints how the computer is not just a cold, rational and objective vessel for electrons, but also a perfectly transparent projection screen, a window through which almost any dream imaginable can be observed. Rafman illuminates the human longing that makes the thingness of the computer transparent. The interface effects produced by the computer have the power to convince the user that there is *another side*, a cyberspace that seems to exist independently from the computer's existence as a thing. By pulling this bewildering footage from seemingly bottomless containers — the servers that make up the internet — Rafman succeeds in capturing an escapist impulse — that by means of digital objects, one might be able to relieve oneself of the burdens of this embodied, thingly existence, to transcend from reality into a purely conceptual sphere. The first sentence we hear the soft voice speak is: »As you look at the screen, it is possible to believe you are gazing into eternity.« 14>

Hito Steyerl opposes this experience of digital transparency. She stresses that the image on the screen is »a thing simultaneously couched in affect and availability, a fetish made of crystals and electricity, animated by our wishes and fears — a perfect embodiment of its

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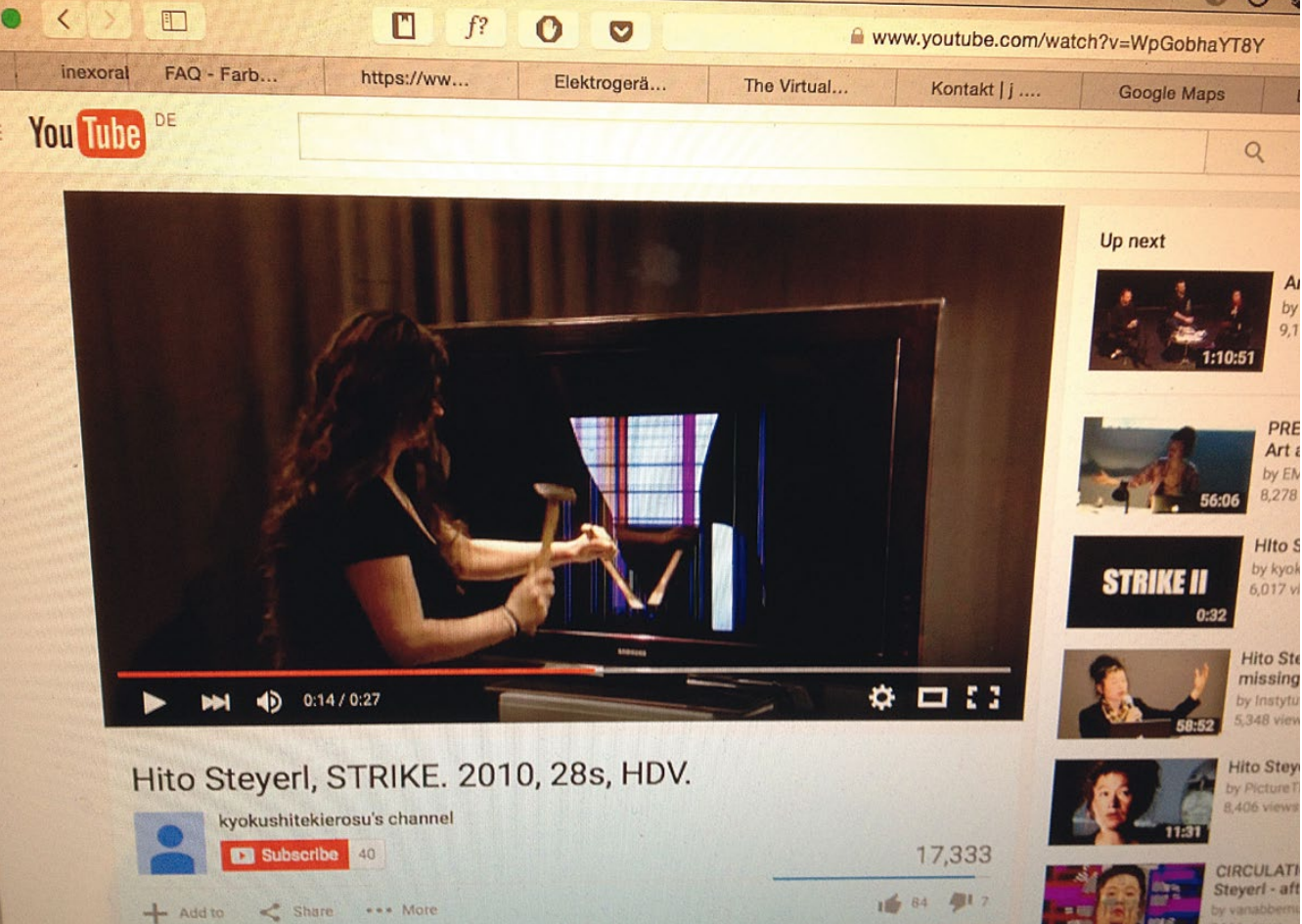
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Hito Steyerl, STRIKE. 2010, 28s, HDV.
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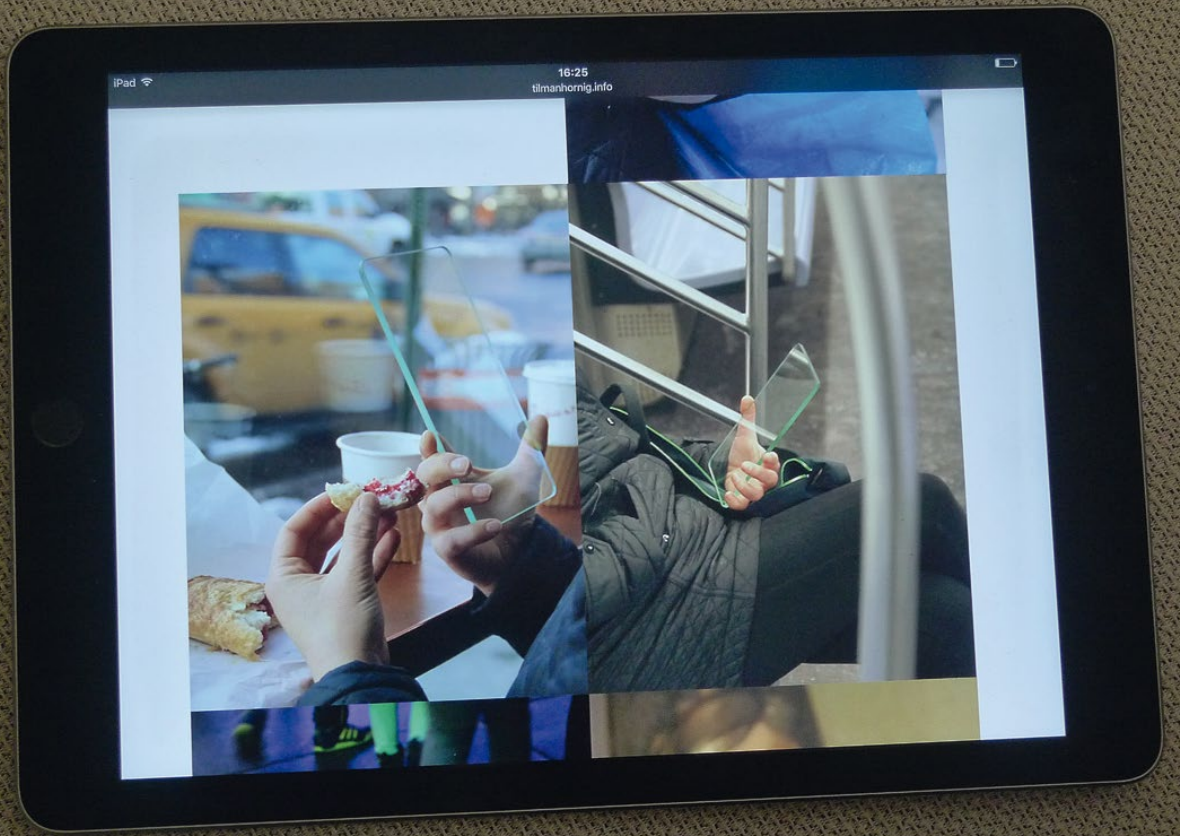
overleaf: still from Hito Steyerl's /STRIKE/ (digital video, 28sec. 2010) The video consists of two takes. First, we briefly see a close-up of the artist. She looks calm and resolute. She begins to walk. She is then shown in profile. We see that she is walking towards a large flat screen TV. The screen is black. Steyerl holds a chisel up to the screen and quickly strikes it with a hammer. The glass of the screen breaks. The colourful lines that become visible reveal that it was turned on all along. Its transparency is lost through a brief moment of violence. (e)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tilmanhornig.info

overleaf: two images from Tilman Hornig's series /GlassPhone/ (object and digital photographs. 2014)
Hornig's ›portable and applied sculpture‹ is a thick piece of glass with rounded edges. It has the size of a large smartphone or a small tablet computer. The documentation of the device show people holding this piece of glass as if it was indeed a smart device; we see hands touching and tapping. This is not a window, it is a useless object. But its empty presence reveals how deeply integrated into everyday life these devices have become in such a short time; they are placeholders, tools to ›look through‹ at digital objects that somehow feel as if they exist in another time and space. (f)

own conditions of existence. [...] It doesn't represent reality. It is a fragment of the real world. It is a thing just like any other — a thing like you and me.« (Steyerl T) For Steyerl, digital images are necessarily embodied entities. Thus, the images in Rafman's video are not just imaginations, they are *really there*, a result of the physicality of the computer and its workings. They exist outside of the observer, and they remain physically present even if no subject is looking at them, though to be meaningful they have to be seen and understood. The images of encrusted keyboards in Rafman's film suggests that no matter how immersed in digital reality the person in front of the screen may be, they are still tangled up in things. These images document that the objects on the screen are sustained by human existence. Rafman shows inhabited ruins, the real, dirty traces of complete self-oblivion.

> In Fiona Apple's song »Window«, the lyrical I notices that »It wasn't the outside world I could see Just the filthy pane that I was looking through« (0:27). What does one see if looking through the pane without being able to see the outside world behind it? (cf. Byatt 2) How filthy does a window need to get before one realizes that it is not transparent anymore?

No matter how deeply immersed a computer user might be in the

14 Artists such as Cory Arcangel, Ryan Trecartin, Ed Atkins or Simon Denny are also investigating in this aesthetic of the digital human condition; they each use very different approaches and techniques to pin it down: a physically hacked game cartridge combines classic romantic longing with the nostalgia of obsolete 8-bit video games (Arcangel, »Super Mario Clouds«, 2002), an immersive environment of multi-channel video catching the almost unbearably shrill and cacophonic exaggeration and acceleration of contemporary conversations made void of any real content (Trecartin, »Site Visit«, 2014), the eeriness of a lost and lonely virtual naked body (Atkins, »Ribbons«, 2014) or the appropriation of the sleek look of internet businesses (Denny, »All you need is data: the DLD 2012 Conference REDUX rerun«, 2013).

Indeed, there is a growing interest in what James Bridle (in lack of a better description) has coined »New Aesthetic«, the often uncanny feedback of computer generated imagery into human experience even beyond digital devices (Bridle). However, digital glitches or gifs are no longer geekish »deviant art« but have become an accepted mainstream style used in memes and advertising (Snoad). Bruce Sterling partly foresaw this development. Even though he lauded the »New Aesthetic« as a »genuine aesthetic movement« that had »a promising start« and »touched something new, true and real«, he also heavily criticized its proponents for eventually simply installing new metaphors for old ones and thus failing to truly critically engage with what they are concerned with: »When computers first shoved their way into analog reality, they came surrounded by a host of poetic metaphors. [...] [T]hey were anthropomorphized and described as having ›thought‹, ›memory‹, and nowadays ›sight‹ and ›hearing‹. Those metaphors are deceptive. These are the mental chains of the old aesthetic, these are the iron bars of oppression we cannot see. Modern creatives who want to work in good faith will have to fully disengage from the older generation's mythos of phantoms, and masterfully grasp the genuine nature of their own creative tools and platforms.« He wishes for a more rigorous examination of this rich visual language: »A sincere New Aesthetic would be a valiant, comprehensive effort to truly and sincerely engage with machine-generated imagery—not as a freak-show, a metaphor or a stimulus to the imagination—but *as it exists.* The real deal, down to the scraped-metal chip surface, if necessary.« (Sterling, n. p.)

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effects of the machine, sooner or later they have to step away from the screen, to sleep, for example
Thus, the transitive moments Crary described remain inevitable disruptive occasions.

[Smartphones still need to be charged,
power can fail,
chargers are forgotten at home,
hearts can suddenly stop beating
…]

In these moments, when the effects of the machine are disconnected from the objects they are recognized as, the computer becomes objective in Arendt's sense again. It seems essentially distant, a *Gestell*, a set framework — or a window frame — made to fit our understanding, animated by the desires it is fueling.

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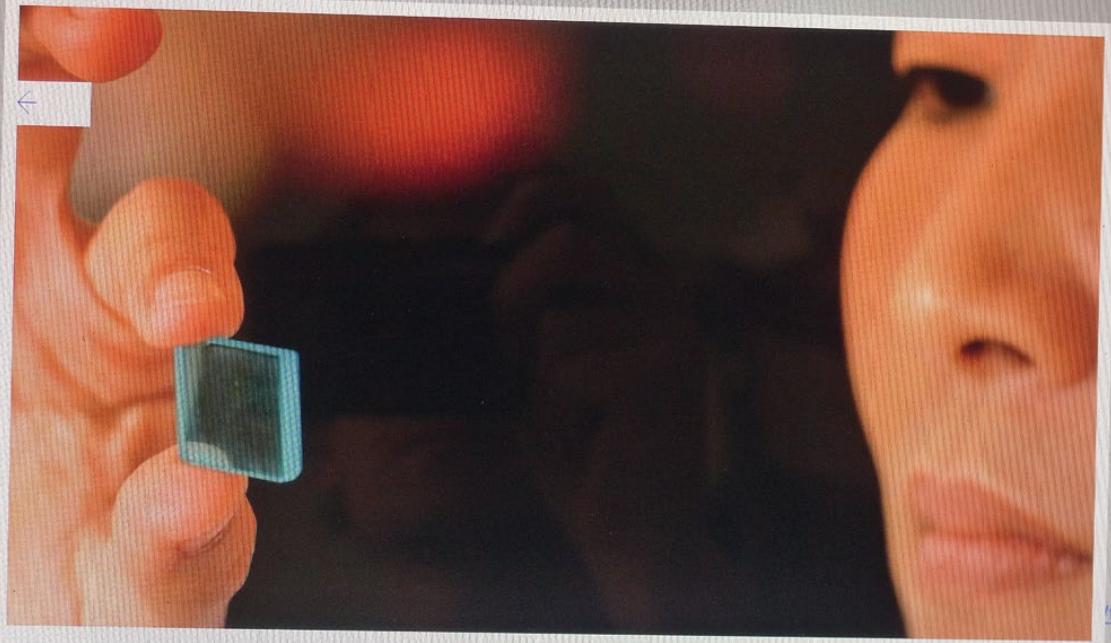
shape and presence of an unseen entity and its abstract manifestation through visual phenomena.

Project Category

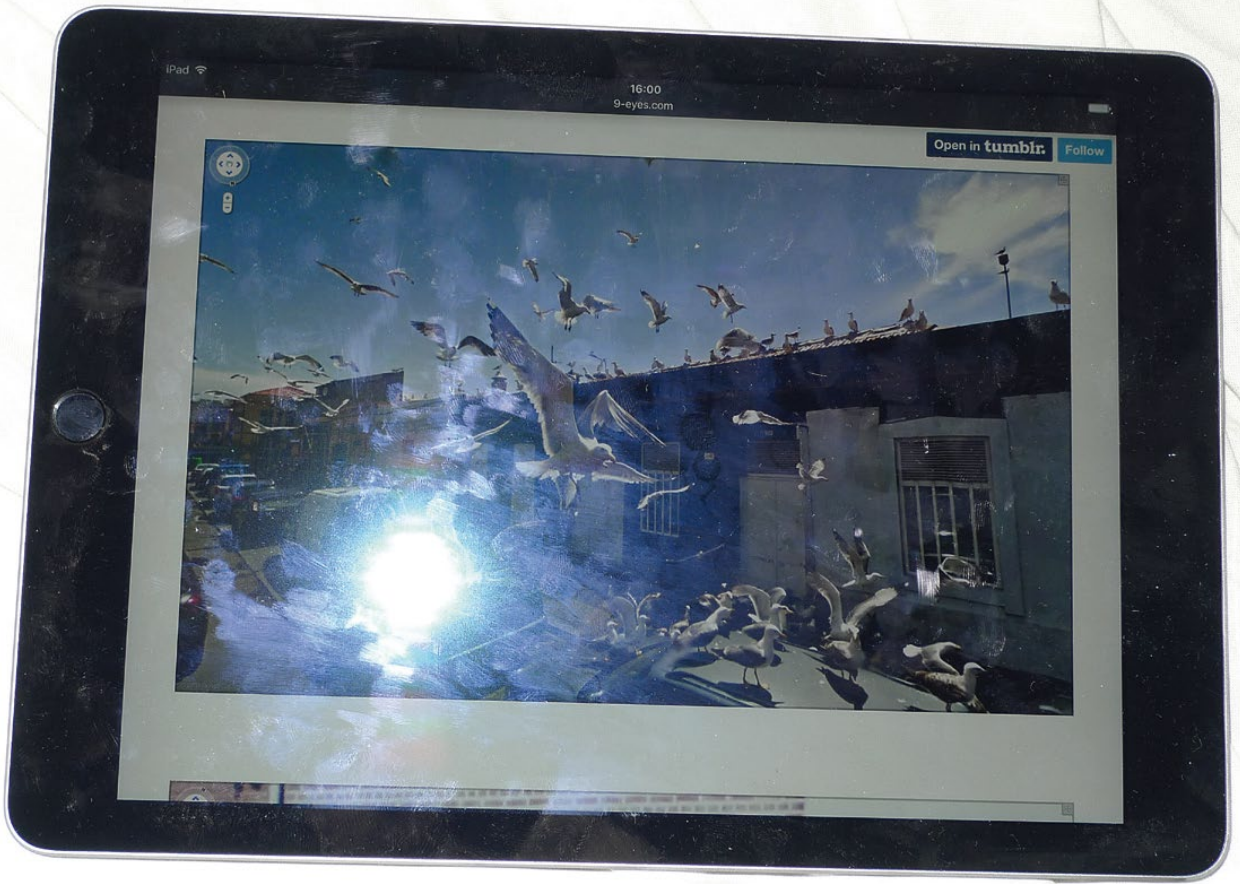
commission and group exhibition



I ©The Otolith Group
Image 2 of 2

http://www.moma.org/visit/calendar/film_screenings/175
http://www.redcat.org/event/otolith-group-radiant
http://www.schermodellarte.org/ENG/FilmFestival/festiv
http://www.cinemadureel.org/en

overleaf: still from The Otolith Group's /The Radiant/ (digital video, 64min. 2012)
/The Radiant/ is a film essay that explores the aftermath of the events of 11 March 2011, when a large undersea earthquake 43 miles off the east coast of Japan caused a tsunami that killed thousands of people and led to meltdowns of three nuclear reactors at the Fukushima I Nuclear Power Plant. The film investigates ways to communicate the phenomenologically ungraspable power of radioactivity. It draws on historic news reels, interviews and found footage. The image shows a still of a sequence in which we see a woman carefully disassembling a digital camera. She attentively looks at each piece. The production of the digital image through the interplay of these parts is as impossible to comprehend as the very real effects of radioactivity; both escape our senses. (g)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9-eyes.com
Open in tumblr.
Follow

overleaf: image from Jon Rafman's /9 Eyes/-tumblr (collection of digital images. 2009)
Rafman's series is a different take on street-photography: Instead of going out himself, he browsed Google Street View, looking for serendipitous moments that had already been captured by the nine cameras mounted onto the cars Google sent out into the streets of the world in pursuit of the company's aim to »organize the world's information and make it universally accessible and useful.« (Google) (h)

1.2 ENTERING THE COMPUTER. OR: INSCRIPTIONS OF FIRST AND SECOND ORDER

The German word *Gegenstand* that Arendt used to emphasize the (active) »standing against« that causes the durability of objects can hardly be used to describe the digital objects that reveal themselves behind the glass of the display. They are, as Friedrich Kittler put it, »surface effects« (Kittler G 1f); they do not *stand* solidly and fixed, they pulsate and flicker. Arendt's concept of the stabilizing quality of enduring objects is being called into question by the (postmodern) idea that objects are rather related to abstract concepts of language: that they are signs, written and communicated in a permanent process of construction and reconstruction; that they exist independently from the thing that sustains them. The computer seems to be a perfect reading and writing tool. It registers and equalizes the things in the world by translating them into binary code; it promises to make them accessible and malleable as a text; every thing is turned into a calculable media phenomenon, a matter of language. [15]

Kittler noted that the »general digitization of channels and information erases the differences among individual media. [...] Inside the computers themselves everything becomes a number: quantity without image, sound, or voice. And once optical fibre networks turn formerly distinct data flows into a standardized series of digitized numbers, any medium can be translated into any other« (ibid.). But then, again, what happens when the existence of things suddenly disrupts the abstract grammar of conceptualized objects; when the data centre in which this text is remotely stored is hit by a meteor, when you »get bopped on the head by a falling nut« (Brown 3f)?

The successful embodiment of the idea of the universal Turing machine and its effects establish a compelling rhetoric of bodiless signifiers: like the writing on the page, the writing of the computer is presumed to transcend its material instantiation; however, digital inscription is not a literal *in*-formation of some thing, it is writing in a system that has been *in*formed, inscribed to function as a Turing machine. Kirschenbaum notes that »computers are unique in the history of writing technologies in that they present a premeditated material environment built and engineered to propagate an illusion of immateriality« (M 135).

From this perspective, the digital object I am writing right now — the text I see here — is not considered to have a very different status

15 As computers and computation have become increasingly ubiquitous, every aspect of media has been greatly affected by digitalization, and something that might not necessarily had been considered a media phenomenon before has since probably already been turned into one by means of digitalization--the steps I made (recorded by a smart-watch pedometer), the last trips I took using public transport (saved on my Oyster Card), the seagulls (captured by a Google Street View camera)...

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as this individual printed and bound book, which bears the weight of gravity, catches dust or its scanned version. Digital objects are regarded as translations of immaterial patterns of bits that can be handled and transferred without friction, bodiless writing that can be retrieved allegedly anywhere, anytime, a combination of flipped and unflipped switches: »identification without ambiguity, transmission without loss, repetition without originality«, as Kirschenbaum puts it (M 11). In this logic, the book is just one more translation of this pattern. Its status as a thing, the choices of font, or of paper, are rendered irrelevant; the idea of the text is thought to exist independently from its embodiment. The accessibility of digital texts is commonly understood to be rather a question of format than of substance. Therefore this concrete physical object, the thing I am writing on right now, has become exchangeable. It is no longer anything like Arendt's enduring and withstanding table and chair, but rather regarded as but one portal, one interface, one of many ways to access this text.

> [this sentence here, for example, boss written buy dictating it into my computer.]

There is no manuscript that could accidentally burn. Things seem to do not to matter anymore.

> In June 2014, a large bitcoin mine, a facility hosting computers that produce the crypto-currency by solving complex mathematical puzzles, went up in flames in Thailand; the heat from the computers is believed to have caused the fire (Chibber).

To use Heidegger's terms: the digital *Gestell* challenges the material. ›Dumb‹ sand is regarded as a resource (*Bestand*) that is refined (*bestellt*, ›cultivated‹) into silicon. Silicon is forcefully inscribed (›cultivated‹ once more) in order to encase the abstract idea of the Turing machine; it is made compliant to host language. In »There is No Software«, Kittler writes about this process of inscription to produce computer chips:

> The last historical act of writing may well have been the moment when, in the early seventies, Intel engineers laid out some dozen square meters of blueprint paper (64 square meters, in the case of the later 8086) in order to design the hardware architecture of their first integrated microprocessor. This manual layout of two thousand transistors and their interconnections was then miniaturised to the size of an actual chip, and, by electro-optical machines, written into silicon layers. Finally, this 4004 microprocessor found its place in the new desk calculators of Intel's Japanese customer and our postmodern writing scene began. For the hardware complexity of such microprocessors simply

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> discards manual design techniques; in order to lay out the next computer generation, the engineers, instead of filling out uncountable meters of blueprint paper, have recourse to Computer Aided Design, that is, to the geometrical or autorouting powers of the actual generation. (n.p.)

This act of writing, this *in*forming of material, to make it stand ready as a chip that operates as a Turing machine, is an inscription of first order. It creates a structured container for electrons. By claiming that »software does not exist as a machine-independent faculty« (ibid.), Kittler called attention to the fact that software necessarily needs a sustaining physical framework. This framework is commonly known as hardware. In order to make the computer do something, to produce digital objects, the abstract, coded instructions of software (language) need to be broken down into smallest executable instructions concerning the individual physical bits by which the machine operates. Only in this translated form — as physical bits pulsing in a physical structure — can they result in an effect, which then potentially produces a meaning. Thus software, argues Kittler, results in physical effects within a physical system — it is never just abstract, immaterial language.

Software, in this sense, can be understood as an inscription of second order. It is what goes in and out of the container, the material that causes its *outpouring* Its coded language requires the first-order inscription, the structuring of the chip. (The paper tape Turing uses as a metaphor to explain the operation of a computer is »divided into sections« (Turing 231).) [16]

Questioning the status of digital texts, Kirschenbaum comes to differentiate between the *forensic material* and the *formal material* of the computer. Building on the forensic idea that »every contact leaves a trace« (M 49), he understands *forensic material* to be the invisible and intangible but nevertheless actual physical presence of the bits a computer uses to work with (M 70); there are, for example, concrete manifestations of this letter Y as electric or magnetic charges on my hard disk, or the hard drive of the server where it is automatically transferred and saved. These traces are second-order inscriptions: no new switches are made, added or removed, they are just ›flipped‹ on or off. Resonating with Flusser's criticism of »typification«, Kirschenbaum states that »forensic materiality rests upon the principle of individualization, [...] the idea that no two things in

16 It is possible to argue that the formalization of language as software is yet another layer of ›cultivation‹: it affects the way humans interact with the world, and the computers within it. I will eventually adjust my habits and thinking to the logic of the machine (cf. Kaeser). Building on Heidegger's /Gestell/ that causes every thing to be regarded as a resource (/Bestand/), Albert Borgmann refers to this adjustment as /device paradigm/. Borgmann uses central heating as an example to argue that once there is a working technological solution in place that conveniently solves a problem, the complexity of the solution seems to disappear: heat becomes a matter of setting a number on the thermostat (Borgmann 41f). Similarly, a working internet connection makes accessing texts online seem to be a matter of course (cf. Blum).

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the physical world are ever exactly alike.« He thus disagrees with many new media theorists and opposes the idea »that electronic texts are ephemeral, [...] [or] somehow inherently unstable and always open to modification [...], or that electronic texts are always identical copies of one another« (M 17).

Kirschenbaum defines *formal material* as the result of the interdependencies of the formalized structures of a computer with these physical traces. He identifies both the hardware and the software as structuring agents that frame and define how physical traces become instructions that in turn cause new traces which may then cause meaningful effects. He defines »formal material« as »the procedural friction or perceived difference — the torque — as a user shifts from one set of software logics to another.« (M 13) Johanna Drucker summarizes his ideas as follows: »forensic materiality refers to evidence, while formal materiality refers to the codes and structures of human expression.« 17

Indeed, in the strange aesthetic of digital glitches and lags between input and output, one might still sometimes catch a glimpse of this *formal material* in operation (P par. 4). 18

Kirschenbaum points out that this *formal material* and the illusion of immateriality it suggests through its operation can only be sustained by »hyper-redundant error-checking routines« (M 12) that constantly deduct any unwanted noise, any irregularities caused by the imperfection of the material substrate, from the entropy that results from the computer's existence in a contingent world. In this way, writes Blanchette, »computers can self-efface the static — scratches on a record, smudges on paper — that typically signals the materiality of media« (11). *Formal material* actively protects itself from being corrupted by the unreliable and potentially fallible physical support it depends on. Error correction aims to ensure reinforced, equalized, perfectly discrete signals that can be handled as abstract symbols, as entities that functionally transcend into the realm of logic and language and thus no longer belong to the physical world. The workings of the computer thus supposedly result in sheer writing, bodiless bit-patterns used to encode complex combinations of symbols which eventually — after being processed and altered many times — may turn a screen into a window, effect an image, compose a text on the screen, or become anything imaginable (or not yet imaginable). As this sheer writing distances itself from any substrate, there is nothing to ›crumple‹. It is writing with the idea of letters, with the X-ness of X and the 1-ness of 1; there are no dots, no curves, no ink, no paper...

17 Footnotes are a product of /formal material/, too.

18 Kirschenbaum: »Formal materiality is perhaps also the lingering perception of some genuine material residue—however misplaced—which presents, like sensation in a phantom limb, when one cannot quite accept the exclusively formal nature of a digital process; for example, the vague sense of unease that attends me after leaving my desktop music player application on pause for hours on end, something that would harm a physical tape system because of the tension on the reels.« (m13)

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However, this distancing through writing is caused and sustained by an underlying structure, the *formal material* of the machine. This structure mediates between the physical realities and the abstract realities of the computer. If I was to ›crumple‹ the substrate that sustains this functional structure and given that the error-checking routines would not be able to recreate the former order, the structure would ›collapse‹, bringing the machine to a halt. The sheer writing of the machine would instantly cease to exist. What would remain is the ›crumpled‹ physical substrate of the defunct machine (a ruin) bearing *forensic* traces, inaccessible to human senses. These traces both formalized this substrate to function as a Turing machine (first-order inscription), and, within this formalized structure, constructed the now gone abstracting distancing of the writing (second-order inscription).

In his lectures on »Optical Media«, Kittler, drawing on Flusser's idea of the »virtual abolition of all dimensions«, illustrated how the successful embodiment of the digital abstraction, the cultivation of sand into silicon in order to produce sheer writing, which then can be put to use to produce all kinds of effects, encapsulates an historic semiotic development:

> In Flusser's model, the first symbolic act [...] was to abstract a three-dimensional sign out of the four-dimensional continuum of space and time. This sign stood for the continuum, but because of this dimensional reduction it could also be manipulated. Some examples are obelisks, gravestones and pyramids. The second step consisted in signifying this three-dimensional sign through a two-dimensional sign. [...] The third step was the replacement or denotation of two-dimensional through the alleged one-dimensionality of text or print, which McLuhan's media theory also claims, although all of our book pages since the eleventh century are structured surfaces [...].
>
> What all of these reductions had in common was that the $n\text{-}1$ dimensional signifier at the same time also concealed, disguised, and distorted the signified, that is, n dimensional. This is the reason for the polemics of Greek philosophers against gods of flesh and blood, the wars of iconoclasts or reformers against religious images, and finally in the modern era, the war of technology and natural sciences against a textual concept of reality. In this last war, according to Flusser, one-dimensional texts have been replaced by zero-dimensional numbers or bits — the point is that zero dimensions do not include any danger of concealment whatsoever.
>
> When seen from this perspective, computers represent the successful reduction of all dimensions to zero. (O 226f)

Kittler goes on to describe how the computer is used to reverse this reduction to recreate two-dimensional or even three-dimensional (considering virtual reality even four-dimensional) effects out of this zero-dimensionality of binary bits (ibid.).

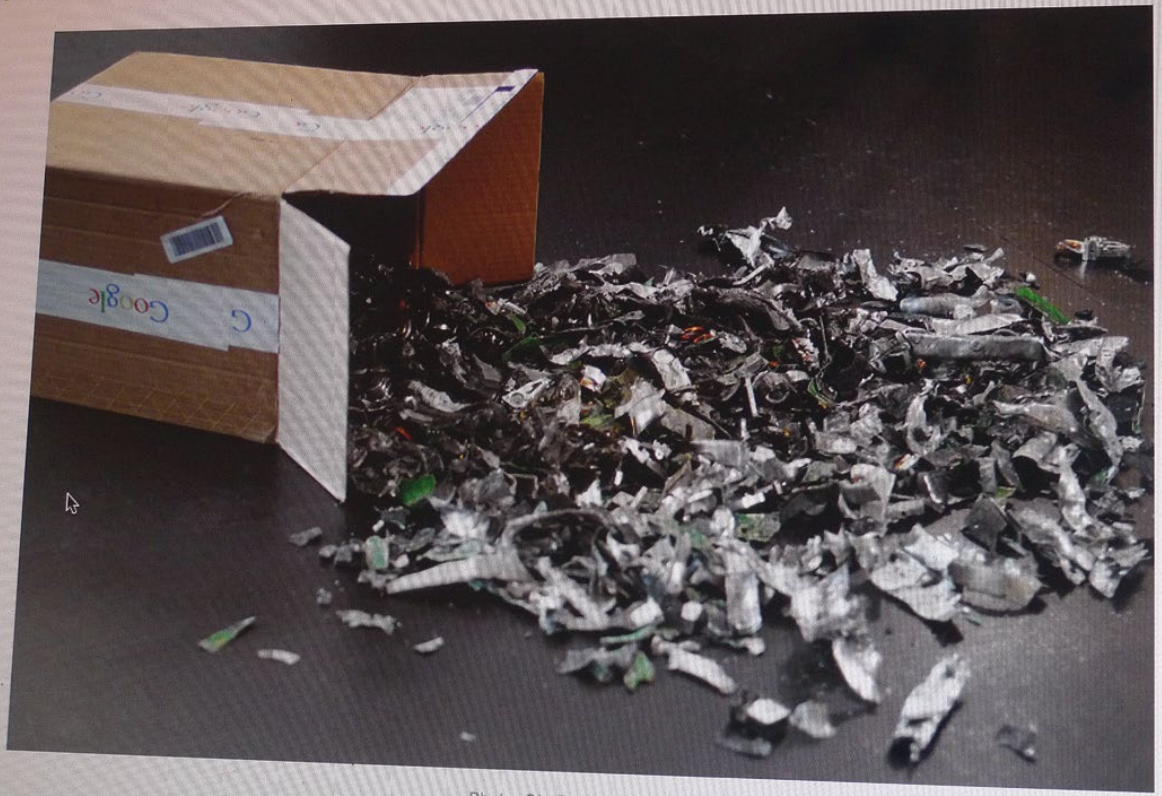

Photo: Ole Reißmann

overleaf: image documenting Sebastian Schmieg's and Johannes P Osterhoff's project /10kg From the New Factory/ (box containing shredded hard disks. 2014) When Schmieg and Osterhoff saw a picture of shredded hard disks in Google's own documentation /Inside our data centers/, they asked the company if they could send them a sample of those discarded devices and soon received a full box from one of Google's data centres in Saint-Ghislain, Belgium. The artists regard this /stuff/ as showing the fundamental body of the services and interfaces Google provides. (i)

In other words: a computer cannot *embody* or *incorporate* the things in the world, it can only *textualize* them. It ›solutes‹ and ›resolutes‹ them to reconstruct them as effects; but these effects are not self-sufficient, they rely on the computer's existence as a mediating thing, an incorporation. Writing creates distance. Distance may be misunderstood as objectivity.

Writing about the ontology of digital images, Johanna Drucker refers to this misunderstanding as a »mythology in which code passes for truth« (G 145). According to Drucker, it stems from a strong emphasis on form over material in Western philosophy, an attempt to find perfect and unambiguous representation of human thought. This wish to externalize ideas without having to depend on a material form leads to the concept of *mathesis*, the representation of knowledge in mathematical form (G 141). (Kittler's explications on the abstraction through »symbolic acts« fittingly illustrate this concept.) Drucker opposes this notion with the idea of *graphesis*, »embodied information« (G 142):

> If ›form‹ is conceived in mathematical terms, it can be absorbed into an absolute unity of essence and representation, while if ›form‹ is conceived in terms of graphesis, then it resists this unity in part through the specificity imparted by material embodiment. (145)

This »specificity« could be the paper this thesis is printed on, the choice to use a dot matrix printer to materialize parts of it, the fact that it is printed on A4 paper, or even the fact that I wrote it using a computer; it is the actuality of things that constantly disappoints the idea of total contingency.

N. Katherine Hayles finds that the changed status of *things*, this heightened emphasis on objectivity, consequently leads to a problematic concept of what it means to be human — a ›posthuman‹ outlook that »privileges informational pattern over material instantiation« (2). Hence the »embodiment in a biological substrate is seen as an accident of history rather than an inevitability of life.« A posthuman perspective »configures human being so that it can be seamlessly articulated with intelligent machines. In the posthuman, there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals« (3). Hayles' book »How We Became Posthuman« is an attempt to understand this rhetoric. She looks for »what had to be elided, suppressed, and forgotten to make information lose its body« (13). 19>

Mark B Hansen is an avid supporter of Hayles' critique of both the conservative techno-sceptics and those who believe the digital can provide means to all ends. To understand how the human is constituted through the technological milieu that surrounds them,

19 For information theorist Luciano Floridi, becoming posthuman means becoming an ›inforg‹ (informational organism): »It follows that we are witnessing an epochal, >>>

he examines the body and its sensory potentials in relation to technical media. In order to decenter human sensation, he applies Whitehead's extended notion of perception, which not only encompasses human sensory experience, but radically broadens the idea of the subject to all kinds of relational situations: »Whitehead's expansion of perception takes the important step of anchoring perceptions *within the material universe where causality reigns*. For Whitehead, that is, perceptions [...] are never simply subjective creations (»ideas« or »impressions«) that transform the fleeting appearances of material reality into certain subjective contents; rather, perceptions are themselves caused *by the very same kind of shift that causes all events in the universe's becoming*.« (48) Looked at this way, twenty-first century media (as Hansen distinguishes them) become part of an intricate system of relations of human and non-human perceptions; the Kantian *Gegenstand* loses its solipsistic existence as the act of recognition does not happen in a vacuum, set apart from things, but rather only because the body is amidst them — as a conscious *actant* among *actants*. Hansen finds that »neither consciousness-centered nor bodily-centered approaches seem capable of grasping the level of materiality and the sensuous heterogeneity at issue in the twenty-first-century media« (50) as media »impact experience by shaping the ongoing worldly production of sensibility that constitutes the sensory confound out of which perception proper can in turn arise.« (46) Working »beneath the senses« he argues that twenty-first-century media »bypass the older mediations via embodiment — the gradual bodily estimation of the perceptual — in favor of a more direct, in some sense radically disembodied, surrogacy.« (51) In other words: as soon as the *thingly* contemporary digital media operate as intended, they no longer just disappear as the individual leaves of paper disappear when they are recognized as the pages of a book — a working interface is rather designed with the conceptual nature of its content in mind: it emits sensations. It is reading itself out loud instead of just waiting for someone to read it. This makes digital data seem somewhat arrogant; the limitations of human perception become a burden, a handicap that unfortunately needs to be dealt with and which slows down the actual processing of the bits as they need to be expansively translated. The content of the screen in front of me could thus also be understood as a crutch.

Drucker (like Kittler, Hayles, Flusser and Kirschenbaum) regards this supposed ideality of digital data, the belief that it is self-identical and independent of material embodiment, as a highly problematic »positivist ideology« (G 141). If the computer was in fact a

>>> unprecedented migration of humanity from its ordinary habitat to the infosphere itself, not least because the latter is absorbing the former. As a result, humans will be inforgs among other (possibly artificial) inforgs and agents operating in an environment that is friendlier to informational creatures. Once digital immigrants like us are replaced by digital natives like our children, the e-migration will become complete and future generations will increasingly feel deprived, excluded, handicapped, or poor whenever they are disconnected from the infosphere, like fish out of water.« (15)

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machine that could successfully outsource thinking, and the writing it produces was abstract bodiless thought that could be processed and transferred without friction or loss, this would preclude »any critical intervention in the investigation of terms of being and their reception in cultural frameworks« (ibid.). There would no longer be a Kantian *Gegenstand*, as digital data would directly and purely represent the recognized object; without ambiguity there are no reasons to question things. However, as Drucker affirms, »[w]hatever the ›ideality‹ of code may be, even if it were (as it is not yet at least) directly available to sentience in some unmediated way, it is in the encounter of matter and mind that form is produced as thought (and thought as form)« (G 144).

Digital data, the writing of the computer, can always just *describe* something, but it cannot *be* the thing it describes. It always points away from itself, necessarily denying its own physical manifestation that hence might be forgotten and ignored, but nevertheless lingers on, more or less silently sustaining the digital objects that convince us that they are pure and insubstantial.


IBM
Data Processing
Division
San Jose, California

overleaf: image depicting the delivery of an IBM 305 RAMAC in 1959; its IBM 350 hard disk unit was capable of storing five megabyte of data..
In his book /Tubes. A journey to the centre of the internet/, Andrew Blum recounts the moment when he was presented the actual thing that sits at the beginning of the fibre optic cables through which almost all of the data of the internet is sent: »So a gig is a billion," Westesson said, nonchalantly. He held in his palm an optical module of a type known as an SFP+, for ›small form-factor pluggable.‹ It looked like a pack of Wrigley's gum made of steel, felt as dense as lead, and cost as much as a laptop. Inside was a laser capable of blinking on and off ten billion times per second, sending light through an optical fiber. A ›bit‹ is the basic unit of computing […]. That pack of gum could process ten billion of them per second – ten gigabits of data.« (Blum ch. 5). (THREE)

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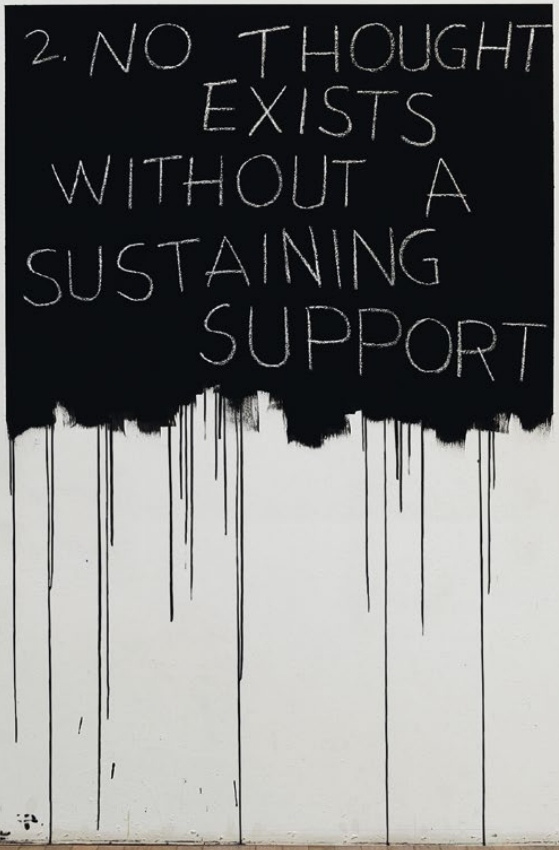
2. NO THOUGHT
EXISTS
WITHOUT A
SUSTAINING
SUPPORT

2
THE CONCERN

2. 1 REVISITING A SENSIBILITY

The idea of the *sustaining support* in my thesis leans on that of Mel Bochner's 1970 work »No Thought Exists Without A Sustaining Support«, which has been a steady source of inspiration for me. We see a rectangle in landscape orientation, painted in black directly onto the wall. The sharp and formal edges on the top and sides contrast with the uneven and negligently executed bottom, paint dripped down to the floor. The title is presented as an axiom, written by hand in chalked capitals. We read:

2. NO THOUGHT / EXISTS / WITHOUT A / SUSTAINING SUPPORT

Here there is a slightly ironic association of blackboards in schools, of having to memorize theorems. The numeration (»2.«) at the beginning of the text indicates a series. The work numbered as »1.« is a very similar mural that reads:

1. LANGUAGE / IS NOT / TRANSPARENT

The sentence is presented using only a limited set of materials: a white wall, black paint, and chalk. However, these materials are used very overtly, they become part of the writing and remain visible as they are demonstrating the idea they are denoting. Idea and form are congruent yet irreconcilable. All of Bochner's works can be understood as vigorous affirmations of the idea of *graphesis*: they stress the friction between the thingliness of the materials and the concepts they have come to embody. Bochner lets his materials *perform* concepts. He uses them as *formal material*, demonstrating that things can indeed form meaningful constellations, structures that convey language and logic, but that they necessarily need to be sustained by things. He shows how reading things as conceptual objects always means repressing the materials that have been used to convey them. 20>

Hence, Bochner's works are engaged in grasping the background of thinking. In accordance with Edmund Husserl's notion that consciousness is always »consciousness of something«, Bochner aims to emphasize the physical background necessary for understanding, the manifest logical structures of knowledge (Siewert 3.; Bois xvi). In writing about his work »A Theory of Sculpture«, he identifies the »enormous abyss« that »separates the space of statements from the space of objects« (Bochner 145). Instead of bridging this space,

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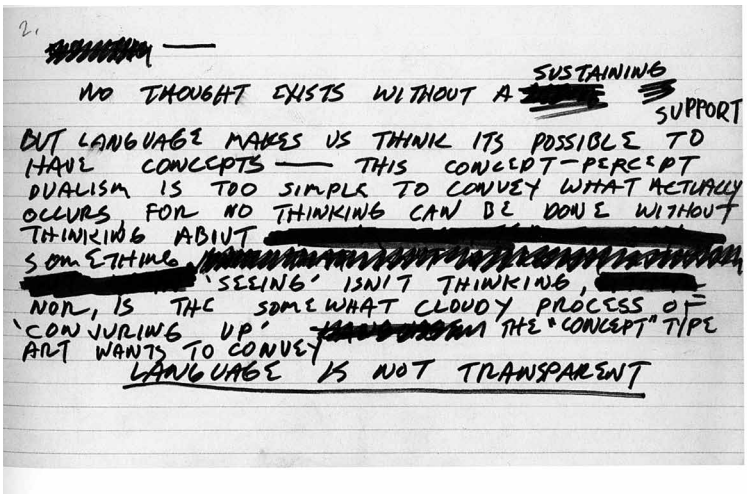
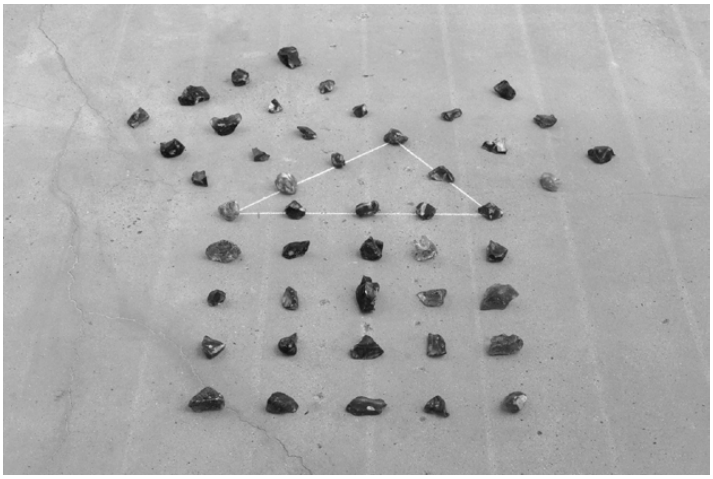


20 (B) Notecard with thoughts on the wallwork.

(C) Part of the series »Theory of Sculpture«. Installed in 2013 at Peter Freeman, New York.



(D) Part of the series »Theory of Sculpture: Fontana's light.« Installed in 2012 at Marc Selwyn Fine Art, Beverly Hills, using colourful shards of Murano glass which formerly belonged to Lucio Fontana.

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Bochner makes it the pivot of his concern. For this reason his work has also been labelled as post-conceptual.

The criticism of the term »conceptual art« that Bochner expressed in his text »Excerpts from Speculation 1967-1970« very much resonates with Drucker's arguments against the ideal of *mathesis*: »The unfortunate implication is of a somewhat magical / mystical leap from one mode of existence to another« (72). For the conceptual artists, the art object was no longer a unique thing (or *Gegenstand* in the Kantian sense), nor a typified (but still physical, external) object that operates as a sign, but a disembodied idea. Suspending the process of synthesis, the conceptual art object has been claimed to transcend empirical realities — the object of interest is no longer outside the observer, but in the realm of his or her cognition (Albero xvi f). Marcel Duchamp was one of the first artists to declare that his interest was no longer in »retinal« but in »cerebral« art (Tomkins 158). Thus, the conceptual art object is embedded in language; it often questions and blurs the border between language and things, or is argued to be art as pure, uninstantiated thought. In order to realize it, one often has to be able to ›read‹ it. [21]

This ideal of unfettered objectivity has likewise been proclaimed by many cyber-theorists. The 1994 »Magna Carta for the Knowledge Age« begins with declaring that the »central event of the 20th century« has been »the overthrow of matter« (MC). The conceptual art object and the digital object are both argued to be dematerialized. However, whereas conceptual art mostly grew out of a critical concern, from questioning the relationship of the subject and the (art) object, and a careful examination of how the art object is created through and held by the linguistic and institutional structures surrounding it, the structures that become the *formal material* of the computer as it functions have long become impenetrable. Like other objects sustained by media, the digital object is easily assumed to have a »mystified and abstract identity, sundered from any relation to the observer's position in the cognitively unified field« (Crary T 19); there is a cause (I hit a key on the keyboard) and an often immediate effect (I see the corresponding letter on the screen), but the process causing it has become untraceable, as Apple's Steve Jobs put it: »It just works.« (Jobs)

21 This, of course, can only be a very rough generalization. Alexander Alberro's and Blake Stimson's »Conceptual Art: A Critical Anthology« has 624 pages and weighs 1359 grams. I carried it back and forth between my studio and my home often enough to know that it would be preposterous to summarize and equalize all artists and ideas put under this umbrella term in only a few sentences. »Conceptual art« itself is a concept; but, as Alberro and Stimson have worked to show, it produced a rich field of evidence. Alberro puts it this way: »In its broadest possible definition, then, the conceptual in art means an expanded critique of the cohesiveness and materiality of the art object, a growing wariness toward definitions of artistic practice as purely visual, a fusion of the work with its site and context of display, and an increased emphasis on the possibilities of publicness and distribution.« (Albero xvii)

22

(E) I met with Marieta Chirulescu, who established a very personal and experimental translation process into and out of digital images. Her final works are paintings. She combines and layers digital images that she prints out in various ways, often decisively opting for a low quality, she then paints over those prints, and scans them in again. She moves the image back and forth between her computer desktop and easel. She told me that the equipment she uses cannot easily be replaced. She often relies on very particular faults that create effects she includes into her images. She also stressed that the fact that scanners are not often programmed to automatically enhance the image they produce and the disappearance of poor quality printing makes it harder to creatively work with the friction of the machine.

(F) Yuri Pattison's work is concerned with the internet as a physical space and the political and visual shifts and feedback effects caused by digitalization. For a recent solo show in Berlin, he re-enacted the enforced physical destruction of hard disks on which the files leaked by Edward Snowden were stored. The hard disks were in possession of the /Guardian/. The newspaper agreed to destroy the devices after it was threatened with legal actions. Under the supervision of technicians from Government Communications Headquarters (GCHQ), a small team of /Guardian/ staff used angle grinders to render the data irretrievable. (Borger) Pattison filmed his re-enactment of the destruction of a hard disk using a USB microscope. Alongside the physical ruins he created, he showed the resulting film as a YouTube clip that is streamed on a prototype of Google's Chromebook.

Lastly, (G) Tilman Hornig's sculptures »GlassPhone« and »GlassBook« struck me as brilliant puns that encapsulate the notion of digital transparency. (See image f on smaller page ix)

I am inclined to argue that it is possible to similarly compare Bochner's post-conceptual sensibility, the realization that the art object necessarily relies on a sensuousness of its presentation (Barranco 154), with the so-called post-digital condition. Florian Cramer defines post-digital as »a state in which the disruption brought upon by digital information technology has already occurred« (n.p.): ›Cyberspace‹ is no longer regarded to be different or other to experience; it is not a magical, futuristic beacon of hope but has become a reality of life that, however, is still in many ways unchartered. Just as conceptual art failed to completely dematerialize the art object, the advancement of digital media into everyday life makes it apparent that things cannot just exist as digital objects; there is always an actual residue. Artists and thinkers embracing the idea of the post-digital now explore this space. They question the difference and distinctions of digital and non-digital objects and their respective conceptions, ideologies and politics. The post-digital sensibility embraces plurality; digital objects are increasingly regarded to be but one state of existence, and digitalization is no longer automatically equaled to progression. Thus, post-digital could be understood as a term that describes a turn away from the promises of digital contingency, the abundance of images and possibilities, and towards the realities of the computer. <22

I hope to similarly address the abyss between the physical entity of the computer and its meaningful effects by revisiting (and partially even re-enacting) the post-conceptual sensibility towards things using digital means. But how can the background of thinking, the engagement of the consciousness with digital objects, be made practically evident (or even manifest) if there is no discernible fixity, no discernible *stuff* that these objects are made from? Bochner manipulated *actual* things. He arranged pebbles, nuts, and sticks to show how they become readable as numbers and embody concepts (Berardini). I cannot show the *actual* physical bits of the computers I am using. I cannot stack electrons; I cannot make them manifest while they produce the effects that become recognizable as digital objects. I therefore, with knowing futility, try to insert myself into the processes that lead to their creation and work among the friction caused by the *formal material* of the machine. I see my practice as exercises in grappling with the evasive body of digital media. I translate, transform, and literally *in-form* things using digital devices. My hands — my own digits — are often visible. I aim to create resonances and associations between the pieces — broken glass, crumpled and folded paper, format, formalities, frames — in order to construct a quasi-didactic setting: The physical entities can easily be linked to the seemingly immaterial effects that brought or are still bringing them into being and with each other, but these relationships do not ›explain‹ anything. The mediated body of digital media, the structured emptiness of empty containers itself becomes media content. Reading is possible but void. The ›thing‹ in question is a physical structure in operation.

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As Bochner has emphatically demonstrated, things do not speak for themselves, they are outside of language. Even though things can be used to ›make sense‹, they remain things, they remain present. This presence, however, is unintelligible. In this sense, I understand my practice as an extension of the verbal encircling of the black box established so far, a questioning of the ultimately absurd physical substrate that sustains the opaque background of the language of digital objects by means of things instead of language.

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ON CHOOSING THINGS TO WORK WITH

I focused on digital devices that are close to myself, that belong to the everyday experience and the setting of my ›home office‹: A4 sheets, laser prints, scanners, my laptop, ebook readers… They are readily available for experimentation: I can take them and stack them, I can handle them as things. I decided to limit the inquiry of digital things to my subjective view as an end-user; to press my nose against the glass of the tablet computer, as it were.

During the course of my research I got further drawn towards the aesthetics of scanners and laser printers. They are seldom regarded to have an aesthetic agency and usually thought of as neutral or at least utilitarian. I am especially interested in this ›taken-for-grantedness‹. Just as the body of the book is reconsidered as more and more texts are read on screens, the ›naturalized attitude‹ (Zuboff 36; Siewert 3.) towards laser prints is also slowly being called into question. As there are now different, more compelling ways to translate digital objects, black and white laser prints regain their thingness in their poorer quality representations. Just like the poor image on the screen (Steyerl P), they bear the traces of the *formal material*, the process that brought them into existence. I appreciate the slight imperfections of the laser printers I work with. 23

A standard A4 printout is another strange object: it is no longer a digital object but is not regarded to be a *real thing* either. The photocopied / laser-printed page is always considered to be a copy. It is not thought of as the real thing. However, it is *a* real thing—just as the pattern of bits that encode this text and the physical interface showing representing it in translated form. 24>

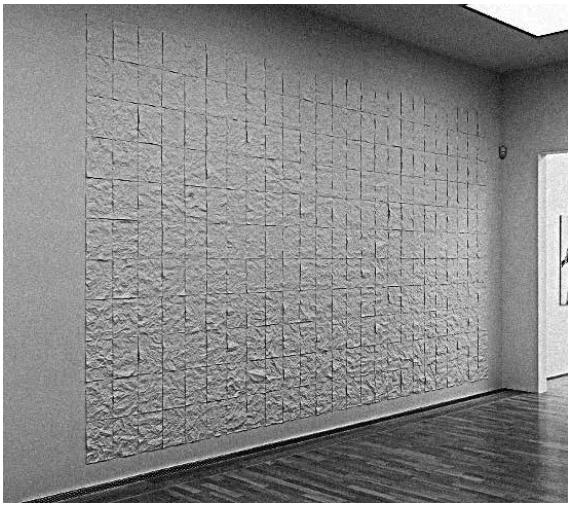
I use standard paper sizes (ISO 216 / DIN 476) to frame and consolidate the works. 25>

23 Gitelman notes that the introduction of the photocopier in 1960 quickly changed how people thought about documents. Suddenly, everything could be turned into a document by placing it on the glass of the machine (102f). But more importantly, there was no need for central archives anymore. The word on the page became virtual, giving rise to the idea of disembodied information.
Artists quickly explored the new medium. Mel Bochner's *Working Drawing and Other Visible Things on Paper Not Necessarily Meant to Be Viewed as Art* (1966), is an early play on McLuhan's claim that »the xerox machine makes every man a publisher« (Bochner W 177). As the New York School of Visual Arts Gallery invited him to curate a small drawing show and refused to pay for the framing of the working drawings he intended to show, he decided to reproduce them with the Xerox machine that the school had just recently installed. He invited other »intellectual workers« to submit other personal working drawings and studio notes. To round the number up to 100 he added lists, charts and diagrams from a copy of /Scientific American/. He turned this convolute into a photocopied edition of four. He presented them in four identical loose-leaf notebooks on sculpture stands. (ibid.)
Similarly, /The Xerox Book/, published in 1968 in New York by Seth Siegelaub and John W. Wendler, was planned as an »exhibition in print«. The seven artists who were invited—Carl Andre, Robert Barry, Douglas Huebler, Joseph Kosuth, Sol LeWitt, Robert Morris, and Lawrence Weiner—were each asked to work with the format of the standard paper size and the idea of the dissemination of art through a photocopied book over 25 pages. (XB)

27

(H) Wolfgang Tillmans used this effect variously to call attention to the substrate of photographs. For his series /Lighter/, he produced abstract images by directly exposing photo paper to light. After developing them, he further foregrounded the paper by folding or crumpling it, turning the image into an object (Lorch).

(I) Ignacio Uriarte is as fascinated by the richness of seemingly bland office materials as I am: »In office work too you'd be surprised at the pictorial and sculptural motions you make« (cf. Giers). For his work /Crumpled and Flattened/ he took standard A4 sheets of paper, crumpled them, flattened them out again and then fixed them to the wall in an 11 x 25 grid. When I was confronted with this piece at the Lenbachhaus in Munich (long after thinking up my ›original‹ introduction of this thesis), I was struck by how similar our sensibility for these matters is. However, his perspective is much more poetic than mine; where he playfully accentuates office materials, I am more interested in their media function, in understanding the structures that let them become invisible.



(J) Another notable crumpled A4 sheet is Martin Creed's /Work No. 88. A sheet of A4 paper crumpled into a ball/

I use both the well-known A-series and the lesser known B-series, which have the same aspect ratio but fit exactly between the sizes of the A-series (B4 is between A4 and A3). The images in this book that show my practical work are framed by A4 sheets once more; they often show other standard sized sheets of paper. Every thing has been scaled to fit onto the same pane. [26]

Again, I am fascinated by how natural this standard has become: a drawing of a rectangle with the aspect ratio of 1:1,4142 will very likely be associated with paper. The simple act of scaling pages by folding them makes the standard evident as *formal material*: it reveals how the abstract mathematical concept is embodied in the paper and that this embodiment *matters*. The folds at the same time demonstrate the incorporated ratio and re-assert the sheets as things. They can be thought of as an orderly version of the crumpled page: They disrupt the idea of the sheet as being two-dimensional and let it oscillate between being a flat (picture) pane and a self-sufficient, three-dimensional thing. [<27]

/

During this research project, my angle of questioning has changed slightly. I moved from questions and complications on the process of (digital) translation (2.2) and the physical act of *in*-formation (2.3), to looking at interfaces as things (2.4). I will describe these changes before introducing the practical work it resulted in.

24 Those photocopies were still analogue electro-photographs. (The light reflected from the object on the plate caused the image on the image drum.) Today all photocopiers contain a digital scanner and a digital laser printeformerly belonged to Lucio Fontana.

25 The international paper size standard is based on two principles: Firstly, the aspect ratio of the page is one to the square root of two (1:1, 4142), secondly, the base size (A0) has an area of one square meter. All smaller sizes derive from dividing the sheet in half across the longer dimension (A1= 0, 5 sqm, A2= 0, 25 sqm, . . .). If divided this way, the aspect ratio will always remain the same. (Since the advantages of this ratio were first noted by Georg Friedrich Lichtenberg in 1786, it is also known as the Lichtenberg ratio (Kuhn

26 The RCA research programme handbook defines the framework for this thesis. It states: »The thesis should be printed on white A4 paper between 70g/m2 and 100g/m2.« (RPH).

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2. 2 ON MAKING DIGITAL OBJECTS INTO THINGS

At first I attempted to emphasize the translation of supposedly immaterial bit patterns into manifest things, the materialization of digital objects. How can I stress the beauty that lays in the banality of printing out a digital text on a laser printer? I hoped to find discernible or conceptual residues of the *formal material* of the digital machines I used for these processes of translation. However, I came to realize that the successfully transmitted object will always be cognitively foregrounded. As the sustaining support becomes a background, it is ›unseen‹; the effect dominates the substrate. It is therefore very likely that an act of translation is regarded to be insignificant. Does it really matter what particular scanner or printer I use to produce an image? Is the PDF on the screen really that much different from its manifestation as a print?

How to question this supposed insignificance? How to question something that is present but not seen?

EMPTY

A commercial four colour (CMYK) offset lithograph on greyish recycling paper (115g/sqm) measuring 520 x 720 mm; edition of one.

In order to print

four crop marks
four bleed marks,
four registration marks, and
two colour bars,

four full-sized aluminium printing plates were developed; a laser translated my PDF-file. The sheet moved through the four colour decks of the printing press. If I was to cut the sheet according to the delineated marks, I would produce an empty A2 sheet.

Printed matter is even more ubiquitous than digital information—it has become completely naturalized. I can (and have, for the production of prints for this project) order prints more easily and cheaply than ever before. I transfer files and just a few days later receive copies of the image I previously viewed on my screen. The flickering digital object becomes a manifest thing, available in abundance. The time, space and labour, the expensiveness of the printing process disappears into a black box; it is compressed. Is there a way to grasp the ›ghost in the machine‹ that makes the marks I saw on the screen only a short while ago appear on this sheet of paper (cf. Ryle 5f)? Could it be that it is still present, captured in this *gathering*? [28] (-> APPENDIX A)

28 A printer told me how diagnostics and even repairs are now done by proxy—if a machine has a failure, it instantly sends a report to a service team over the web. The printer in the facility may then receive instructions of what to do, or sometimes the fault can be resolved from afar. The machines have become so fast and complex that the operator does not and cannot fully understand their workings anymore. (Wuenderlich and Pfeffer 1

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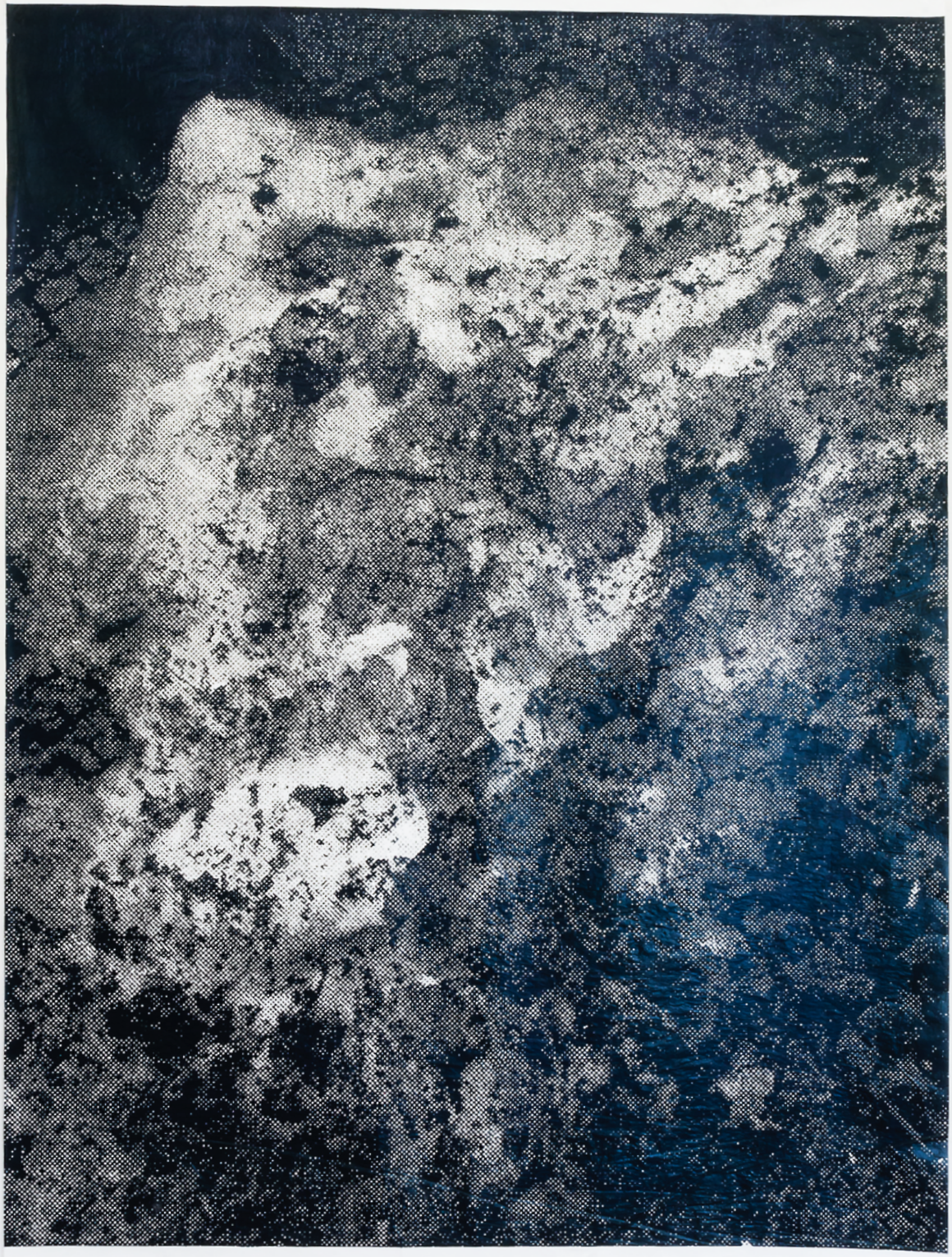


SNOW

A lino-cut, measuring 1.5 × 2 m, printed on Tyvek.

After the winter of 2009 / 2010, the snow did not melt for months in Berlin. Every time it looked like it was about to disappear, it snowed again. This resulted in massive heaps of grit mixed with cleared icy precipitation everywhere. When these heaps were finally and ultimately depleting by mid-April, they became a relentlessly factual, dirty grey-and-brown return of repressed material. The snow almost gone, they were now almost entirely made of grit but also revealed all the debris of outdoor city life: dog droppings, the burnt remainders of fireworks from New Year's Eve, bottles, cigarette butts... dirt and rubbish of all kinds that could not be cleared away because it had been blanketed by snow for so long. I took many (digital) photographs, but was uncertain what to do with them. I did not find these heaps interesting for their potential to depict waste material, but because they forcefully and unavoidably embodied it: they were made of unmediated, ungraspable, useless *stuff*... not objects, but things. 29>

Accepting that it would be impossible to recreate the material experience of those heaps out of digital photographs, I decided to use the images to think about the material and the processes of digital reproduction that made this recreation so impossible. I printed out some of the images on a laser printer using a very coarse raster. The raster of a laser printer is generated by the raster image processor (RIP), a chip that controls which areas of the photoreceptor/the imaging drum are charged by the laser; the toner powder sticks to those areas. The image is produced by transferring the toner onto paper and fixing it with heat. I did not ›make‹ the image, it was processed; I made the choices on how it was processed.

I sought for a certain ambiguity and planned an experiment: Was it possible to use and layer digital and analogue printing materials and processes in such a way that they not just revealed an image but also themselves? Would it be possible to make an image that oscillated between its own thingness and that which this thingness represents — paper white snow, dirty toner grit? 30>

Would it be possible to reveal the traces of the image's digital production?

I re-digitized the image by scanning it in with a very high resolution. I enlarged it and printed it out once more, tiled on A4 sheets. I transferred the toner of the laser prints onto a 1.5 × 2 m piece of linoleum using acetone. I then cut out the dots the laser printer delineated for me. This took about one-and-a-half months, during which I somewhat

29 Something like Robert Smithson's "Partially Buried Wood Shed", but without the intentionality: In January 1970, Smithson, »along with a handful of students from the School of Art, rented a backhoe and piled 20 cartloads of dirt on an abandoned woodshed until the center beam cracked.« (PBW) / (K)

30 Something like Christopher Wool's untitled screen prints/ paintings, although less abstract: Wool reproduced and layered images of blobs and smudges of colors. Each print turns out very different, the raster dots become new blobs of colours, they merge and thus blur the distinction of print and painting. (L)

ironically listened to an unabridged audio book of Marcel Proust's *In Search of Lost Time*. I followed a plan. I did not make any artful decisions. I decided to become a part of the *mechanism*, to limit my expression in order to emphasize the process of the digital translations, to become as indifferent to the image as the RIP of the printer. It was a tedious undertaking. The image was already there, it existed as a delineation, a digital pattern, and now *just* had to be made.

I hand-printed the lino cut three times. I made two copies on paper, one on Tyvek, a fully synthetic material made from flashspun non-woven HDPE fibre, that — even though it could not be any further in substance from handmade paper — somehow has the look-and-feel of Japanese washi paper. Printing from the large lino stock by hand was an incredible experience: I was sweating all over, rubbing the thick paper onto the linoleum with a ball-bearing baren for hours, blistering my hands. It was amazing to see how a digital file could exhaust me in order to become a material image. My hands, my fingers — my digits — bore the traces of the experience of this translation.

I feel that this experiment failed to a certain extent, but that this failure turned out to be very productive. I was slightly disappointed to find that the image had ›won‹. Although I sent it through many layers of translation, it still represents and depicts — it turned out to be more resilient than I had anticipated. The material of the image is highly apparent, but this materiality is nonetheless overruled by the image it becomes.

One of the most remarkable experiences was looking at the linoleum when I was finished with cutting. Although I had spent so long lying on the floor in direct bodily contact with the *stuff* of representation, the image felt instantaneous: it was ›now‹. Just as the duration of a scan is not traceable in the resulting image, the time it took to cut this image became nothing like a claim: conceptualized and framed according to the idea of manual labour, or described as an endurance piece, it loses the actuality of the thing I hoped it might become. As soon as the image existed, it became a recognizable abstraction. [31] (-> APPENDIX B)

31 In an artist talk, Hans Peter Feldmann mentioned how he is fascinated by the vigour of kitschy pictures depicting clichés like sunsets, dolphins or couples on beaches. For his /Sonntagsbilder/ (1976/78) he tried to challenge them by crudely photocopying them in black and white. He said that he could not destroy these images, that the act of cognition would still recreate the colourful stereotypes.) (Feldmann 17:50) (M)

blank

2.3 ON INFORMATION

After having made this productive experience of being ultimately defeated by a (digital) image, I decided to further focus my attention toward the body of digital media itself. Materializing digital data means moving things from one formal structure to another. How to stress these formal structures themselves? Can I emphasize them as causes of a literal *in*-formation of a thing? Do they become evident when I use a medium to reflect itself— when the body of the medium becomes itself media content that is subject to its own *formal material*?

Since I previously studied typography and book arts, I am particularly interested in the supposed immateriality of ebooks and PDFs, the supposed disembodiment of written information through digitalization, and the alleged self-identicality of the page in a book and the page in a digital document (cf. Gitelman 125ff): A PDF is supposed to »look the same on the screen and in print, regardless of what kind of computer or printer someone is using and regardless of what software package was originally used to create it« (USCB). The scanned image you may see right now is supposed to somehow have the same status as this printed book. How to question this argued identicality of form? [32]

32 Indeed, many people are asking such questions. The P-DPA (Post-Digital Publishing Archive), initiated and run by Silvio Lorusso, has the aim to »systematically collect, organize and keep trace of experiences in the fields of art and design that explore the relationships between publishing and digital technology« (P-DPA). Many of the works listed show a growing weariness of the belief that to digitize things is to advance them. They are experiments that point less towards the idea of total digitalization of that which the book once was, and more towards embracing pluralities. To give just three examples:
(N) Paul Chan published his short story »Holiday« through his publishing project ›Badlands Unlimited‹ both on a stone slab and as an ebook.
(O) Charles Mazé's and Coline Sunier's /Digitized by Google/ is a stamp, a »[m]anual version of the digital watermark placed by Google on the lower right side of each page of a PDF document.« (P-DPA, /Digitized by Google/)
(P) Silvio Lorusso's and Sebastian Schmieg's collaboration »56 Broken Kindle Screens« is a print on demand paperback that consists of found photos depicting broken Kindle screens. When the glass of the screen breaks, different pages, cover illustrations and interface elements are accidentally layered. The screen shows a strange, frozen ›collage‹. The artists use these images to examine the materiality of the device. The work can also be downloaded as an ebook onto the Kindle to recreate the effect on the actual device.

THE INFORMATION I (on killing one's darling and creating content)

»In writing, you must kill all your darlings.«—William Faulkner

A

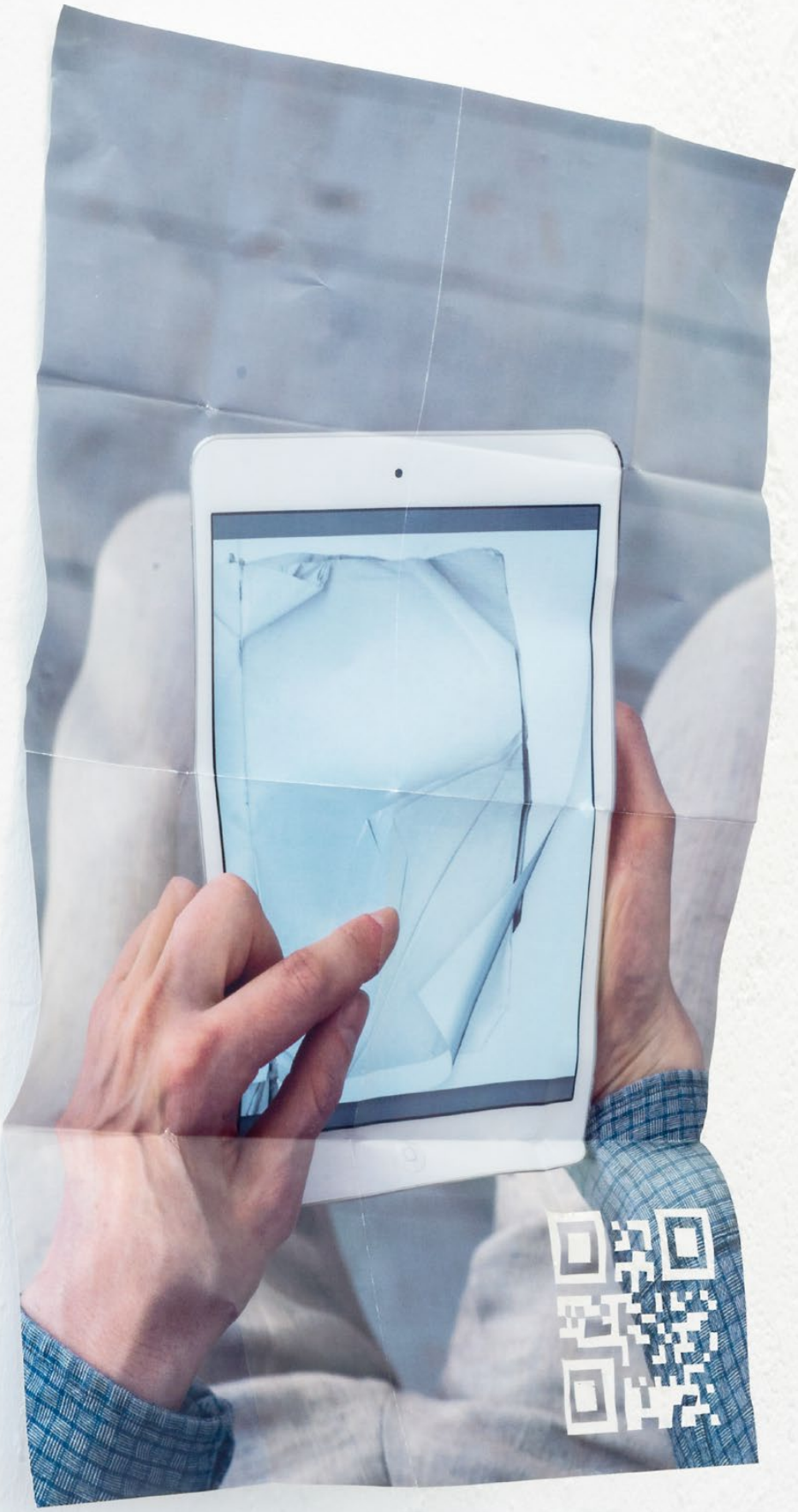
I had a smallish hardcover book bound by a book binder after my specifications. It measures 112 mm × 182 mm, and contains 144 empty pages, the cover and endpapers are light grey, the block is made from a thin recycling paper (90 g/sqm). I (digitally) filmed myself smashing the book for as long as I could (a little over 17 minutes); I threw it on the floor and against the wall; I literally trajected it, I threw it across. I chose the setting and my clothes to match the decisive neutrality and the considered indifference of the appearance of the book, further stressing its emptiness. By smashing it, I in-formed the book; as Kirschenbaum put it: »every contact leaves a trace« (M 49). I attempted to stress the bookness of the book, to show it as the insisting and resisting thing it has to be in order to sustain its media function: a book is not a fluid object. For me, the word ›book‹ does not predominantly denote a malleable, liquid *outpouring* of abstract information but a potentially meaningful thing; like jugs, books exist as manifestations, as embodied gatherings. I did not ›kill‹ the book by smashing it. It remained a book after all, an artificial ruin of a book. [33]

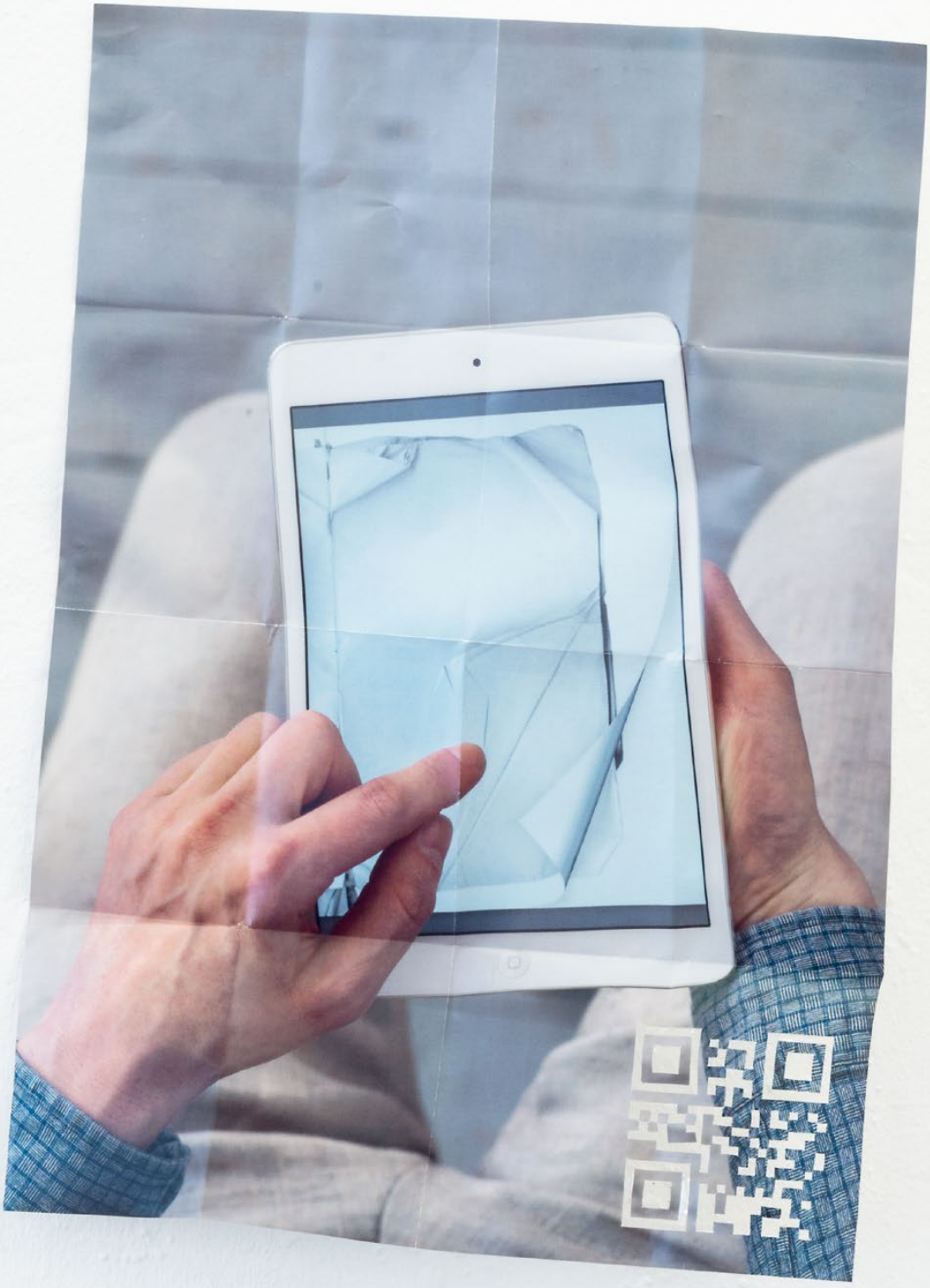
I chose to smash an empty book to question the implications that digitalization has for the body of the book as a container, and how it shifts the idea of the book further towards being a metaphor for disembodied text (and thus memory itself). The book, to use Drucker's words, »represents a self-conscious record of its own production« (C 161). (-> APPENDIX C. 1)

33 In 1966, John Latham invited his students to join him in chewing an edition of Clement Greenberg's /Art And Culture/ to bits (/Still and Chew/). He fermented the resulting pulp into a transparent liquid and then tried to return it to the library of St Martin's School of Art where he had borrowed it (Latham). Books play a central role in Latham's work. He used (and abused) them as metaphorical containers of knowledge, in actions that can be understood as challenging acts of love. He proved that violence against the physical bodies of books cannot kill their ideas, that memory is not material but rather /lives/ in and over time; that all objects (thoughts as well as the things we encounter in the world) are /events/ that occur and reoccur (ibid.). Digital files do not offer shortcuts to the experience of John Latham's metaphysical /events/—on the contrary, the practical immateriality of the digital object makes it hard to subtract the concept from its substrate; it exists in structures that, no matter how invisible they have become, necessarily remain factual. How could I chew an ebook? Would Latham have smashed and burned ebook readers? Could the body of a computer have withstood his acts of love for existence in a similar way?

B

I scanned in the entire damaged book, turning its emphasized three-dimensionality into flat digital images which represent the traces of this act of *in*-formation. I created content by turning the ruin into a digital object. I printed these images onto the same materials using a black-and-white laser printer and then hand-bound them back into four new books, matching the measurements of the original book. The pages themselves became significant. They are no longer empty, they show a translated reflection of the emptiness of the respective page in the original book. I would like to suggest that this process of (partly digital) reproduction turned the act of smashing the book into an act of drawing.





C

Parallel to the recreation of the book as a reflexive and manifest document of its damaged body, I also turned the scanned images into an ebook, an embodied metaphor of a book. I asked a photographer to take pictures of this ›digital book‹ while I ›flipped‹ through it. (Again, I tried to keep the setting for the photographs decisively indifferent.) [34]

The light that passed through the pixels of the screen hit the digital camera and were recorded as yet another digital object, as the iPad showed the skeuomorphic animation of the ›flipping‹ of a page that has no third dimension. [35]

Can a thing ever be two-dimensional?

I chose to present this image as a commercial offset lithograph. I ordered it online. It measures B3. Like the almost empty print, and indeed like all the other works, it moved through a mechanism that has now become invisible.

I decided to fold the paper into eight equal sections (B5) to stress its presence as a three-dimensional thing. The folds function like formalized crumples, they orderly disrupt the flatness of the image that shows and frames the flatness of the screen in it. There is some thing there because other things that are not present have been there — this thing here is a *gathering*.

I cut out a QR (›quick response‹) code at the lower bottom corner of the poster. I physically removed squares that suitable devices may read as pixels. It encodes a link that can be used to retrieve a copy of the EPUB file represented in the image from a server. For Gitelman, QR codes are »an end imagined within the repertoire of the so-called posthuman. [...] Not quite text (from a reader's standpoint) and not entirely image (at the scanner)« (135); without a working interface to decode it, this code is just an abstract, even slightly absurd ornament, that could, however, be regarded as an analogy of how the image visible on the screen is also made up of pixels. [36]

34 The inclusion of full-sized images is still not easy to do in EPUBs as they are mainly meant as containers for reflowable text; the text is ›raw‹ and different interfaces render it legible in different ways (Kanai). I created a ›fixed format‹ EPUB, which is very much comparable to a PDF-file; the pages in such a document are images representing themselves, thought of as self-identical (cf. Gitelman 118f).

35 Apple patented the virtual page flip in 2012, yet the patent does not refer to paper at all, it protects the idea of an »animated graphical user interface« (Cranfill).

36 I also played with this idea when I translated the German text of Benjamin's essay »The Work of Art in the Age of Mechanical Reproduction« from ASCII into binary code, into a string of zeros and ones. Since a string is notoriously hard to depict, I decided to turn it into a two-dimensional bitmap. I added line breaks to let it flow into the proportions of the standard paper size. The resulting image is more like noise than information. In this form, the essay cannot be easily accessed by humans or computers. The meaning of the text is lost in (digital) translation, it is stuck in a limbo of formal material. I include a printed version of this bitmap in the appendix –> APPENDIX D. 2

blank

E

Exhibiting the damaged book and its reproduction proved difficult; after trying to show the work on a table and on a shelf (-> APPENDIX C. 3), I chose to hang them on the wall behind A4 glass panes as if they were images. The books are framed and held in place because the panes are solid things. Each supported by four nails, they press the books slightly against the wall. The transparency of the glass reveals the object behind it. Like a window, it shows the damaged book as it lay on the glass of the scanner. There is a third glass pane, but it is empty; below this frame, on the floor, as if it fell down, is an iPad that plays the video that shows how I smashed the book. The glass of its screen is cracked. All things are subject to gravity.

Can a book be an image?

/

While I was working on shifting the body of the book back and forth between being a digital object and a three-dimensional thing, I became increasingly interested in the glass of the scanner. I started to think of it as a liminal space where things are turned into digital objects. The most interesting aspect for me was how the act of scanning happens in time: a steady movement of a line of light produces reflections that are registered by a photosensor which translates them into a string of code. Unlike a camera, scanners are not dark rooms in which external light is trapped; as Chantal Faust notes, a »scanning device comes equipped with its own in-built light source: its ›sun‹ is artificial and illuminates upon each scan.« (2) 37>

Is this time of the scan the time it takes to ›solute‹ the thing into a self-identical pattern? Scanning is a comprehensible act of digitalization compared to the instantaneousness of capturing images using digital cameras. I used scanners ›naturally‹ in many works but never focused my attention on the scanner itself; as with the reproduced smashed book, the scanner always remained invisible in the finished work. In scanning, there is cause and effect: I can watch the light move. I hear the sound of the motor. And then there is the image on the screen. A scan is the process of the coming into being of the image — in Heideggerian terms: it is an *Ereignis* — a happening. At the same time, a scan promises an objective image: choosing the same settings results in equal movements. The light is always equally bright. Scanning an image several times apparently produces the ›same‹ digital object. How and why — the processes in between the action of the scanner and its effect — remains black box magic. To show the scanner's ›performance‹ of digitalization, and to

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investigate the time and physical space it suggests, I made various smaller exercises, which did not make it into my final selection of works but which I enclose in the appendix. I scanned mirrors and used digital cameras to film and photograph the scanner while it was scanning. -> APPENDIX D

blank


Ready
Error
Epson Perfection V550 Photo

37 Mike Golembewski (a 2004 RCA interaction design alumnus) used flatbed scanners as cameras. He removed the light, enclosed them and shone outside light on the sensor through a system of lenses, creating a »new tool for examining the relationships between time, motion, and image« (Golembewski) (Q).

Luigi Amato's /Untitled #1/ is a digital photograph of an opened flatbed scanner whose glass plate is completely covered by mirrors; a gesture that perfectly questions the scanner's ›pane‹ of vision. (R)

38 The design and publishing collaborative Dexter Sinister (David Reinfurt and Stuart Bailey) beautifully captured time hidden in the scanned image when they scanned an analogue watch. The hand indicating the seconds is bent. (S)

[TECHNIQUES OF THE OBSERVER (amazing gaze)

A

To concentrate on the scanner itself (as a *thing*) and its relationship to the image it produces, I laid two scanners on top of each other. Turned about 90 degrees, the glass of the one scanner faced the glass of the other. I then made the scanners scan each other. They each captured the case of the other device and the enclosed movable image processing unit under the glass. The glass remains invisible. Since both scanners caught the movement of the light of the other scanner in time, the image shows an inclined white line where the scrutinizing lights of the scanners met. However, the duration of the scan is not readily apparent. The lag is lost, the image appears instantaneous; the lines have become a pane. <38

The title refers to Crary's book *Techniques of the Observer*. Examining how perception is historically constructed, Crary suggests that vision is subject to changing conceptions, to »plural forces and rules composing the field in which perception occurs«. The observer—the subject—is »embedded in a system of conventions and limitations« (6). (There is a *formal material* of vision.) Crary argues that the overtly visible changes in the modes of depiction and the processes of image-making, the radical »ruptures« in the avant-garde art movements of the late nineteenth and early twentieth century, even the development of photography, are rooted in earlier changed conceptions about the observer. 39

This process turned the observer from a passive witness of an objective and stable truth outside of him or her—Crary uses the camera obscura as a model to describe this idea—into an emancipated agent who actively constructs objects out of sensory data. Vision becomes subjective; truth something made through a process of synthesis. The key to an objective description of the things in the world was therefore no longer thought to be found in the things themselves (they had been rendered inaccessible), but rather in the *cognition* of objects, in the observer's conceptional potential. Hence, the search for truth was turned inwards, towards the physiology of perception, the techniques of the observer. In turn, human vision became itself an object of inquiry, something »measurable and thus exchangeable« (17). In other words: Vision left the body and objectivity was outsourced as the subject was considered to be too involved in the process of objectivation to be trusted.

The progression of digital technology can be understood as a consequential development of this idea of objectivity. Some people hope it promises the capability of thought unfettered from human subjectivity, an outsourcing not just of vision, but also of thinking.

39 Crary: »Very generally, what happens to the observer in the nineteenth century is a process of modernization; he or she is made adequate to a constellation of new events, forces, and institutions that together are loosely and perhaps tautologically definable as ›modernity.‹« (9)


LTR A4 B5
MAX

Which one of the two scanners is the observer?

B

To foreground the scanner's act of ›cutting‹ up the reflection of things, of rasterizing them to make them into digital images, I enlarged one of the images and printed it tiled on 6 × 4 A4 sheets of paper. I once more used a black-and-white laser printer. The paper is the same I used to make the books. The non-printed edges of sheets, the empty unprinted space in the bottom row and the curvature of the paper all interfere with the diagonal line of the scanner, making it apparent that here light is represented by paper.
(-> APPENDIX E. 1)

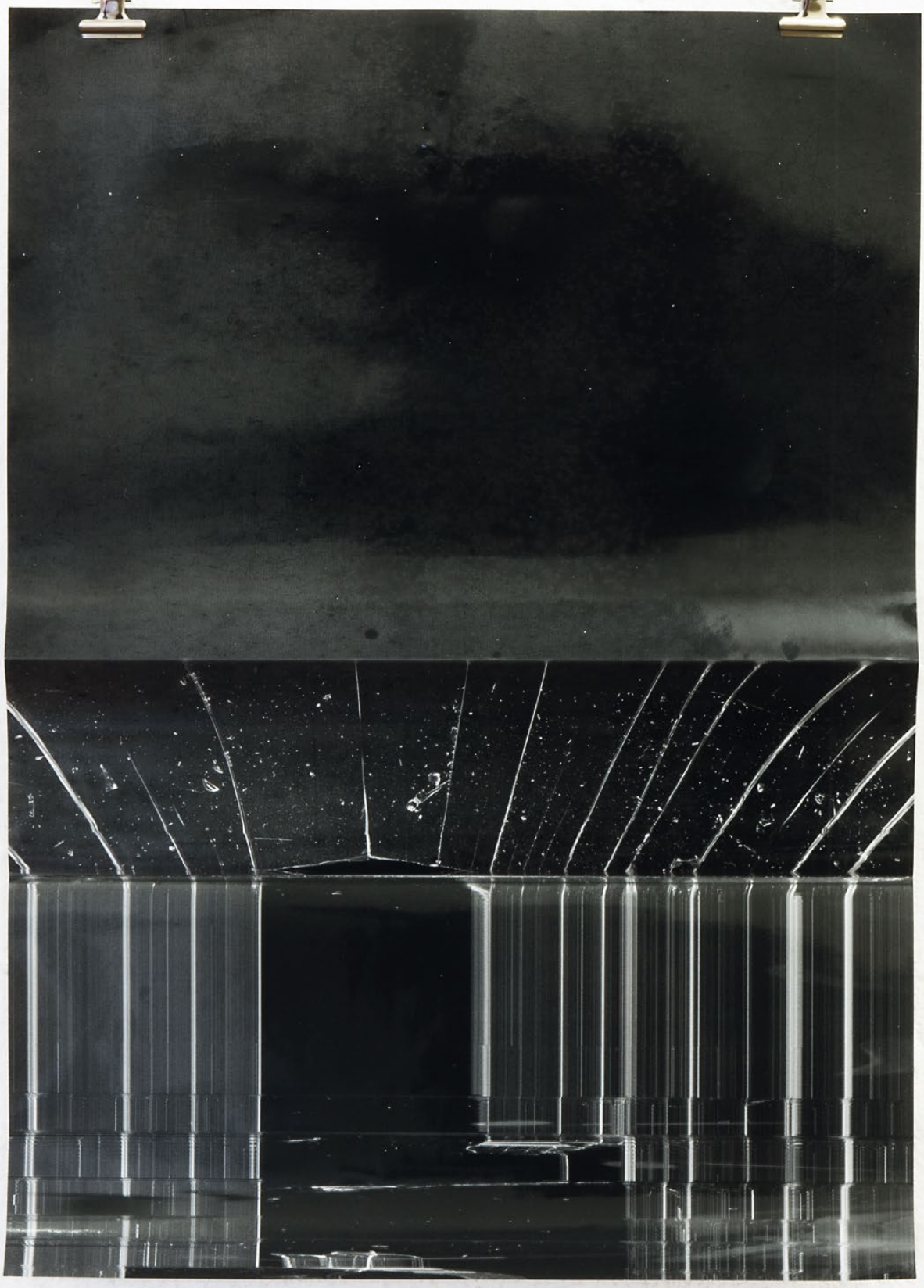
C

To capture the duration of the scan that is lost in the image (and to reflect what real-time means when one is confronted with digital objects), I filmed the two scanners as they scanned each other using my laptop's camera. At the same time, I placed another camera on top of the scanners and filmed the display connected to my laptop that showed the ›live image‹ of how my laptop camera recorded the two scanners scanning each other. In a next step, I repeated this but additionally played this recorded film on the screen. The sound of the scanners is layered with the recorded sound of the scanners, the noise of the fan of the computer, and my occasional clicks on its trackpad. (-> APPENDIX E. 2)

Whereas the image of the scan does not reveal that it was composed in time, it is hard to tell what process one is actually watching in the film; there is a lot going on, but nothing really makes sense or explains anything. The film is an indifferent and intricate, flat and empty layering of digital devices that reflect each other and their own existence in space and time. [40]

This space and time is turned into a digital object: I could write down the file it became as a series of zeros and ones; as a digital inscription it is comparable to a text in a book — the whole story of data is there at once — but human experience cannot access it this way; it must be translated back. All effects that the camera captured, whether the effect of other digital objects (the files on my desktop and some text is also visible in the ›background‹ of the screen) or other ›real‹ things (the edge of the laptop filming the scanners, a plant, and the sunlight shining through the window) have been equalized as image and sound information. Helen Marten compares the effects of such seemingly immaterial layering to an *inlay*. She argues that it cannot have the materiality of a collage because »substance is not really substance when we observe it through the screen« (Marten 6). After the scanners were done scanning, I turned the laptop in my direction and stopped

the recorded film and my recording. The large lino-cut shortly becomes visible in the background, filmed as a digital reflection, a record of a live stream. I press the virtual play button and what was captured as a live stream in real-time in the beginning, starts to play as a record. (A flattened hall of mirrors.)



THE INFORMATION II (handsfree)

Then it hit me:

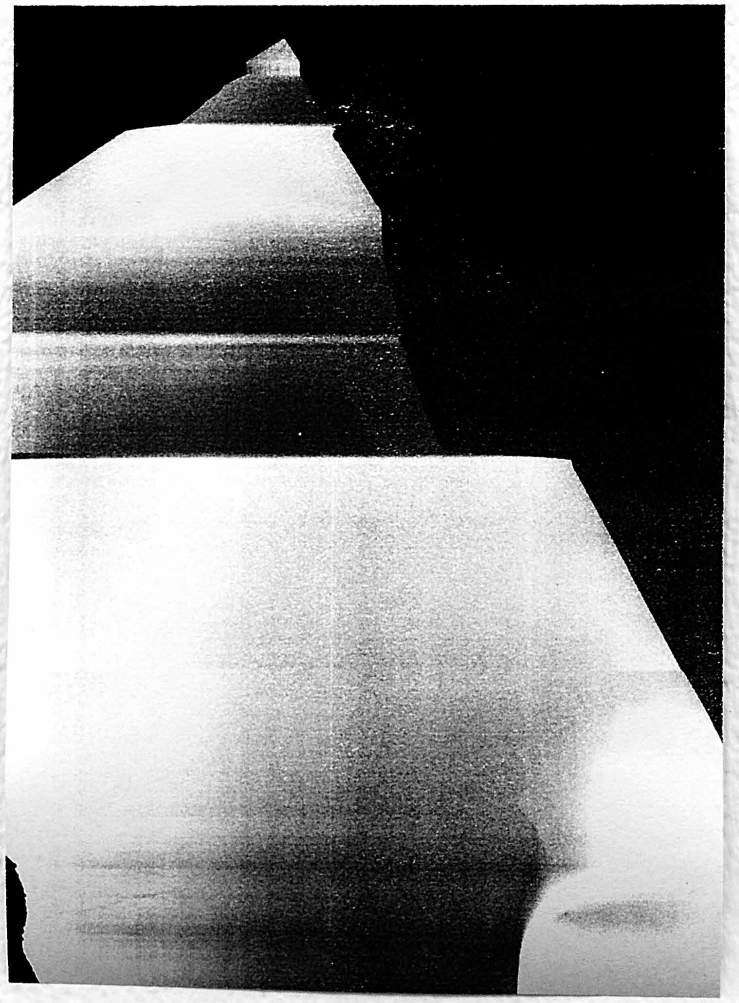
The glass of the scanner is not the actual pane of digitalization, it functions like a window: its firm thingness holds the object at a distance, its transparency lets the scrutinizing light of the image processing unit and its reflections pass.

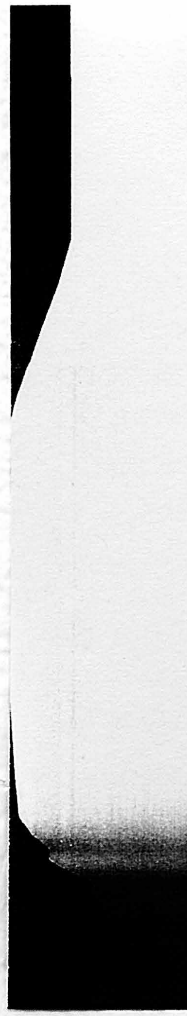
A

I smashed the glass of a scanner with its lid open using a hammer as it was scanning the dark room. I broke its window. [40]

I turned this scan into an A3-sized digital print covered with a glossy varnish. I folded it horizontally to emphasize two ›moments in time‹ — the first line indicates the moment when the hammer smashed the glass, the second shows how the shards blocked the movement of the sensor, resulting in the vertical lines in the bottom section of the image.

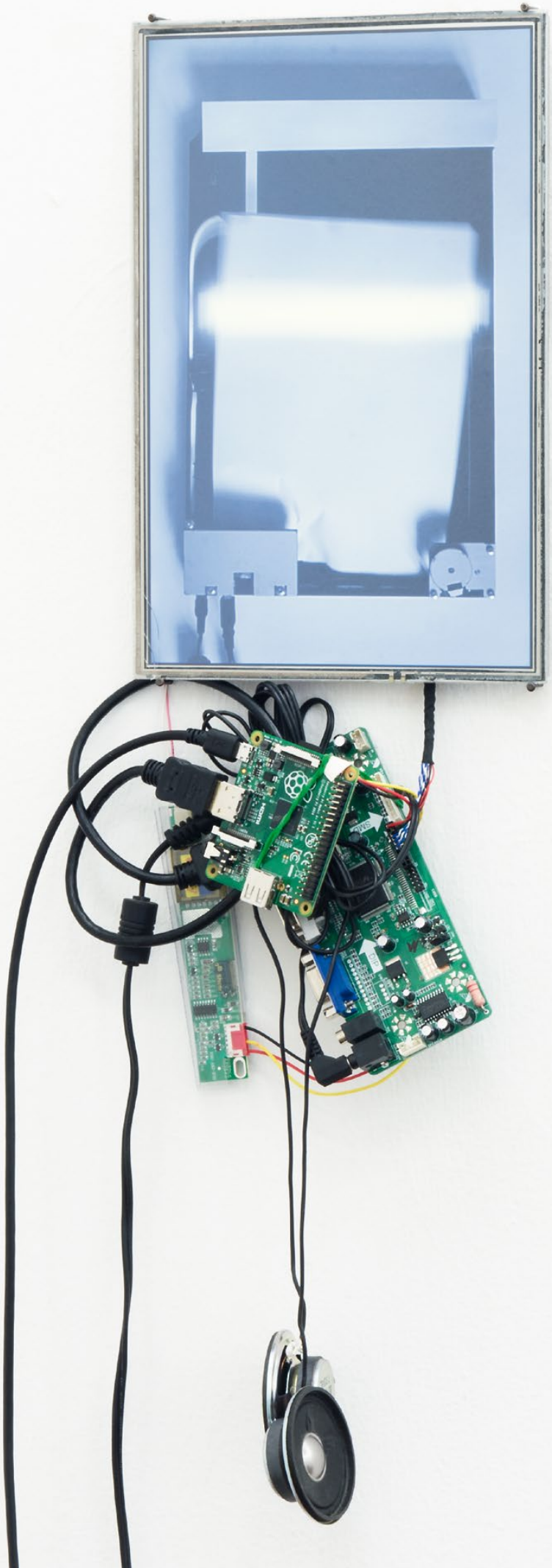
40 After I did this, I was startled to see how Latham's work is not only full of abused books, but that he also frequently used shattered glass to emphasize the bodiliness of transparence; its being there, but being partly invisible. His late work /God is Great #4/, which caused much controversy [cf. Smith]), consists of a Bible, a Talmud and a Koran laying on a field of shattered glass (»God is Great (10-19)«). Once again, Latham concentrated on the metaphorical quality of things, on their quality as /events/, rupturing things to point at their immanent fluidity in time. But again he was much more interested in media as carriers of ideas, as embodied time. (Empty books would not have caused that much controversy.)





B

After removing the glass and the top of the case, I put an empty sheet of recycling paper (the same as I used in the books) into the scanner. I let it scan this sheet for as long as it was possible without having to interfere. It recorded 25 images (-> APPENDIX F. 1). As the sheet was no longer held at a distance, the moving image processing unit crumpled the paper while it recorded an image. It physically *in*-formed the sheet while its sensors processed the light they caught as digital image information. Both things physically resisted each other. I printed the 25 images using a laser printer in the slightly smaller B5 format. (A digital file has no fixed format. It can be effortlessly made to appear smaller or larger.)



C

I filmed the process with a digital camera to document the movement of the light in time. (The light of the scanner was caught by the image sensor of the camera.) The video is 13min20sec long; it is shown on an repurposed raw LCD screen. The paper size of the sheet on the screen matches the scaled paper of the prints. The naked controller-board, the Raspberry-Pi mini computer that loops the digital video file, and two small bare speakers are dangling down from it. It is a slightly messy conglomerate, a thing made of things. (-> APPENDIX E. 2)

D

The crumpled and torn sheet directly relates to the crumpled page introduced at the beginning of this thesis. It is a physical record of the performance of the scanner. It resisted and insisted. It is now a ruin, but is still instantly recognizable as a sheet of A4. Whereas I *re*-presented the paper in the introduction by manually crumpling it, I crumpled this sheet by proxy, by means of clicking a few digital buttons that started the relentless mechanism of the naked image processing unit. (-> APPENDIX E. 3)

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2.4 ON THE BODY OF DIGITAL INTERFACES

After looking at the scanner as a performing interface-thing, my interest shifted away from the structure that sustained its ›interface effect‹ (Galloway) and even further towards the thing sustaining this effect. I now became fully aware that this was what I had been interested in all along: the physical thing that vanishes from perception as it functions as a medium; the becoming invisible of the body of information as this information is accessed.

The last two speculative objects I made attempt to focus solely on this fragile body — they do not sustain digital objects or deal with the act of translation anymore, but are reflections on the emptiness of digital interfaces that my argument of the contingency of their effects relies upon. After all, there is still this unique thing that I can tamper with, this strange body that is thrown into the world, subject to entropy, that exists and thus resists any other thing — despite the language that escapes it, the frameworks that surround it, the *Gestell*.

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amazonkindle


amazonkindle

LITERALLY (TO KINDLE KINDLE)

When Amazon named their reading device ›Kindle‹, it struck me that not more people associated this name with its literal meaning: »to set something on fire«. [41]

Amazon's marketing guidelines even ask to refrain from »Fire/flames and similar graphics« and »Plays on the word ›fire‹ « when advertising their ›Fire‹ products (Amazon). When Michael Conran came up with the name in 2005, he wanted to point to the transcendental qualities of the written word — but in a friendly and everyday way. [42]

Yet I cannot help but think about the many horrible actual book burnings that so forcefully intended to kill the ideas that books embody (*graphesis*) by kindling the body sustaining it. The naming of the device points at the immateriality of the thoughts that a book contains, the idea of language as a bodiless force that lights up minds. It is a metaphysical promise. Unlike the notion of clouds or windows, the name »Kindle« turns a verb into a noun (»The word »Kindle« should not be used as a verb« [ibid.]). Just as Heidegger attempted to grasp the hidden forces that gather what comes into being using collective nouns (the *Gestell* and the *Geschenk*), the name ›Kindle‹ linguistically removes the gap between »that which has (yet) to be kindled« and »that which has (already) been kindled« — the device itself is claimed to embody the experience of reading. Potentiality is argued to have become actuality.

To question this metaphor that suggests an immaterial flame of knowledge (*mathesis*), I read the name as an order: I (digitally) filmed myself setting a Kindle on fire. It was extremely important for me that this did not come across as a gross act of violence against the device or an attempt to criticise digitalization in general, but rather as an absurd and indifferent exercise without much consequence. After all, ›to kindle‹ is not the same as ›to burn‹; kindling the Kindle did not destroy it. It still works. [43]

I completely deleted all data from the device — the screen is blank. I tried to show it as the thing it is. As I am focussing on the relationship between this depicted thing and language (its name), I decided to use the medium of (digital) film linguistically too: the first minute of the film shows me holding the device — the image seems to be a still.

Cut.

41 I later came across Yung-Hsing Wu's article »Kindling, Disappearing, Reading«. Wu brilliantly unpacks these complications by drawing connections between the name and ideas of Ray Bradbury's /Fahrenheit 451/.

42 Conran said in an interview, that Jeff Bezos (Amazon's CEO) asked him for a name that could be used »to talk about the future of reading, but in a small, not braggadocio way. We didn't want it to be ›techie‹ or trite, and we wanted it to be memorable, and meaningful in many ways of expression« (cf. Heller).

43 This project once more resonates with Latham's practice. But again, the emptying out the digital container of content changes the significance of the act, stressing the container, not the containe

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Everything stays the same, except that the device is suddenly on fire. (The cut ›kindles‹ it; just like the flip of the page in this thesis just has.) My hand remains completely still as the flames flicker softly and lambently at the top of the device. (Does it really burn? Or is this a digital animation? The light of the flame has become a digital effect, animated by the light that shines through pixels of the screen.)

Cut.

After a minute the video loops, the cut magically ›repairs‹ the device, it is ›unkindled‹, the slight damage is gone, as if nothing has happened… until it is ›rekindled‹ again. I display the film on a mini-tablet of Amazon's »Fire« series. Another cheap pun. (-> APPENDIX H)

HOMAGE TO DIETER ROTH (such stuffing / as dreams are made on) [44]

Between 1961 and 1974, Dieter Roth created various *Literaturwuerste* (›Literature Sausages‹). He took magazines, newspapers, and books by authors that he did not like or of whom he was jealous, minced them, mixed them with herbs and other ingredients according to traditional sausage recipes, and stuffed this mix into sausage casings. The grand finale was 20 sausages produced from the 20 volumes of the complete works of Georg Wilhelm Friedrich Hegel by the collector Hanns Sohm in 1974 following Roth's instructions (Dobke 74). This mischievous act breaks down the idea of the sublime, transcendental power of the word to expose how it depends on printed matter, on humble, bodily *stuff*. [45]

I bought a damaged first generation iPad (which has now, eight years after it was introduced, become obsolete and thus inexpensive). I had it ground at a waste management facility and then made a sausage following one of Roth's recipes:

1 iPad
1 clove of garlic
1/2 onion
3 tbsp salt
1 tbsp freshly ground pepper
1 tsp paprika
1 tsp fennel seeds
1 tbsp chili flakes
1/2 tsp crushed bay leaves
1/4 tsp thyme
some coriander
1/2 cup red wine

mixed and stuffed into a transparent sausage casing.

This (rather toxic [cf. EC]) sausage is a very different object to a *Literaturwurst*: There was no content on the iPad — I wiped the data on it thoroughly before I had it ground. What was ground were the inscriptions of first and second order that are not recognizable

44 Prospero: Our revels now are ended. These our actors, / As I foretold you, were all spirits, and / Are melted into air, into thin air: / And like the baseless fabric of this vision, / The cloud-capp'd tow'rs, the gorgeous palaces, / The solemn temples, the great globe itself, / Yea, all which it inherit, shall dissolve, / And, like this insubstantial pageant faded, / Leave not a rack behind. We are such stuff / As dreams are made on; and our little life / Is rounded with a sleep. William Shakespeare | The Tempest Act 4, scene 1, 148–158

45 Roth challenged the idea of /typification/ through sheer abundance. He blurred the lines between art and life by turning almost everything into an object of potential interest. For / Flacher Abfall/ (1975–76), he collected almost every piece of flat waste he came across over the course of one year; he put every piece in a transparent film and filed it. There are receipts, notes, and banana peels…(Dobke 160)

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for humans and are now probably not even reconstructable using computer forensics. It is a different kind of useless ruin, a ruin of possibilities. It is a broken vessel, no longer a window. It shows the shattered bodily stuff that promises digital contingency. (Interestingly, if I was to make a sausage of the newest iPad, it would be less than half as big.) When I hold it in my hands, grasping the weight of the stuff that formerly sustained and conjured up digital objects, there is nothing meaningful there that could make it disappear. I am stuck with its bodily presence. It is boring, underwhelming. A (post-post-digital) joke.

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CONCLUSION

This is where my encircling of the computer ends. This project was driven and sustained by my cognitive inability to bridge the gap between the existence of the physical object of the computer, and the meaningful objects its interfaces reveal. In the end, it does not matter if I choose to break the computer and its black box and make it stop working, or if I decide to step back from it to examine the effects its interfaces produce: the existential rift between self and thing remains. In the course of this thesis, I have tried to evoke this rift through a constellation of things and ideas, to make this gap evident through the space of association. I reflected on the state of my own post-digital entanglement in things; things that disappear as they become informational and reappear as this informational state is halted. These transitional moments when black mirrors become digital windows, then black mirrors again, influence not only my thinking and my artistic practice, but my daily life. The three texts included at the end of the appendices are yet another attempt to grasp this entanglement, each dealing with a particular quotidian encounter with digital objects.(-> APPENDIX H)

As I watched myself and contemplated this entanglement — shifting my focus away from the sustained object towards the unfathomable body of digital media — through my writing and the development of my practical work, I increasingly realized that the computer is not at all a compliant, transparent and passive tool. The computer became apparent as a thing that, despite *being* »programmed«, acts on its own: an *actant*, a thing that I not only work with but also very often work *for* to make it do what I want it to do. (For example, in order to loop a video on a raw video screen, I had to order controllers from a supplier in China; we communicated using Google Translate, through silicon and fibre optic cables. I also needed to learn to operate Linux command lines. Each of these processes became insignificant and invisible once everything functioned as planned.) I turned my growing awareness of this *device paradigm* into a process of questioning, which eventually led to each single element of this thesis. I was not looking for ways to open the black box in order to unpack its hidden truth, or a Heideggerian essence of the digital machine. I sought for a vocabulary, a means to point at the abyss between language, digital things, and the objects they sustain. Through my practice, I aim to create a reflective setting that lets those digital things become evident outside of language.

I identified and described the computer as a writing tool that stems from and reflects the language and thus the culture that surrounds it; it is a pre-inscribed sampling machine embedded in what Kittler called a »discourse network« (or, more literally translated, an

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»inscription system«). If Kittler was right when he argued that »media determine our situation« (G xxxix), then the computer cannot be regarded as objective, neutral or empty. It necessarily has been shaped by conceptions and ideologies, which always in one way or another inform its effects. Kittler understood media as manifestations of power structures that impose rules and limitations on our understanding. As all media formalize and typify, they necessarily condition how we think. (»Our writing tools are also working on our thoughts«, he quoted Nietzsche [G 200].) Thus, for Kittler, humans have become ›cases‹ that are ›dealt with‹ through media; the only thing we can do, he suggests, is to »take stock of the situation« (xli ff) by trying to grasp the *formal material* of media (which he does not name this way).

The quantification of everything through digitalization, the unsettling realities of mass surveillance, as well as both the deliberate and unintentional creation of ›big data‹ and its management to predict behaviour (cf. Morosov ch. 6), could be regarded as indicators for how humans are in fact increasingly becoming informational cases, dealt with through (digital) media in Kittler's sense.

Through my practice, I take stock by stepping back from those larger issues, to reflect on individual empty interfaces, the shells and surfaces of contemporary digital devices that frame this *formal material*. I purposely have not, however, tried to explain how they work as machines (as others have done brilliantly already [cf. criticalengineering.com, Kirschenbaum]). I rather aimed to investigate how the thingly existence of the computer and its interfaces are put to work to deny their very bodily existence; I have aimed to embrace the necessary sensuousness of the encounter with digital machines.

As I have discussed, from a post-humanist perspective, digital interfaces are often no longer regarded as physical means, embodying the workings of the machine so that they become accessible to sentience. They are rather understood as a bothersome gap, a noise, a friction that needs to be overcome. As my practical work developed, I found myself revisiting a post-conceptual sensibility towards this underwhelming, unresolvable thingly residue that stubbornly resists typification: I let my point of view oscillate between a more objective attempt to comprehend the computer theoretically, as the embodiment of an abstract mathematical model, and a highly subjective approach toward the phenomenological realities of its material existence. In an iterative process, I have moved back and forth between trying to *understand* the computer as a thing, from a contemplative distance, and attempting to find ways to *experience* its unintuitive material as sensually and as close to my body as possible. From questioning the substrate of digital images, and the problems of the translations of things into and out of digital data, this shifting of perspective has led me to facing, tinkering with and tampering with the digital interface as a thing itself.

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I have observed that there is hardly any noticeable friction in the working of contemporary computers anymore that could be productively exploited; there is almost no indication of the working of the *formal material* of the machine. This is mainly due to the dependable seamlessness of twenty-first-century media (Hansen), which have quickly yet radically changed how people position themselves, how they connect with each other and with the things around them. The very condition of objects has changed tremendously — a book is now no longer necessarily considered to be a bodily container, it can now also be a series of digital images or a digital text (cf. *The Information I*, the PDF of this thesis). However, as I encountered in practice, the more convincing and readily available digital objects become, the greater the rupture when the machine stops working, and the more apparent the *formal material* in poorer quality digital representations turns out to be. The Kantian *Gegenstand* is not lost at all, objects still require the active human act of recognition to be turned from effects into something meaningful.

Accepting the impossibility of accessing the black box of the computer using my senses, I turned instead to observe myself, as I — through my practice — repeatedly asked what this inability means for the status of my subjectivity. I found the stubbornness of *things* to be reliable and rich. And even though their aloof and silent absurdity cannot answer this pressing question regarding the contemporary digital human condition, my grappling with them leaves me with aesthetic experiences and tacit knowledge that now, at the end of my research project, enables me to keep asking this question more effectively.

Through my practical and theoretical encircling of the computer, I hope to have highlighted how *things* ultimately cannot be virtual, how the digital objects produced through the operating embodiment of a Turing machine — as all virtual realities — always require a thingly infrastructure sustaining them, and how this infrastructure necessarily needs to be forgotten in order for these sustained virtual objects to become real through recognition. I am not arguing that virtual objects are not ›as real‹ as the things that sustain them; I am rather trying to emphatically demonstrate what Drucker describes as graphesis: to show how the virtual can only exist through a functional relationship between the ideal and the material [47] — virtual objects never simply exist by themselves. I completely agree with Rob Shields' suggestion that the point is »not to debate the reality of the virtual, but to develop a more sophisticated theory of the real and the ways in which the *virtual* and the *concrete* are different really existing forms, how they are related to each other and to non-existing *abstractions* and *probabilities*.« (21) By emphasizing the underwhelming reality of the computer as a thing, I aimed

47 (virtual stems from the Latin word /virtus/ meaning strength or power—the virtuous describes the better, the more righteous and superior [»virtual«])

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to also emphasize the beauty of the experience of a *frustrated synthesis*: the very human struggle to maneuver and adapt to various levels of abstraction in a world full of things that are instantly recognized as objects pointing away from themselves, towards a fragile virtual world which disappears as instantaneously, when the pointing thing — for whatever reason — fails to keep pointing.

There are many reasons for the existence of empty books. An empty e-book, however, seems to be without any purpose. The page I see when I open my word processing software is not a substrate but a surface effect. I still wish I could reach out to this white rectangle made of light and crumple it; I believe this would be an instantaneous way to wordlessly bridge that gap I can only constantly encircle, a making physical of the virtual. An admittance of the sensuousness of the digital page, and of all digital objects as they are created and sustained over time through the operation of the computer.

The paper page has been gathered, too — trees have been cut, made into pulp… — but it does not need to be sustained: it is manifest. I can *handle* its physical presence. Digital objects are translations of patterns made of physical things that I can neither apprehend phenomenologically nor retrace conceptually: they remain forever distant. We face digital objects as effects without a traceable cause. But just as »No Thought Exists Without a Sustaining Support«, neither does the digital object.

There is some *thing* here.

The idea of the posthuman, as Hayles describes it, could also be understood as a *resolution of existence*: the belief that since consciousness is nothing but an informational ›epiphenomenon‹ (13), it can be digitized and potentially even enhanced by outsourcing it. If consciousness could indeed be broken down into its smallest parts, which form an immaterial and abstract pattern that can be read and rewritten, existence would boil down to a (probably very long) chain of zeros and ones. However, the word *resolution*, as I would like to read it, also implies the notion of ›being resolute‹ — of standing firmly, of being aware and determined.

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APPENDICES

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INTRODUCTION. A PRELIMINARY NOTE AND A PRACTICAL DEMONSTRATION ON THE THING YOU SEE HERE / OR: ON THE THING BETWEEN YOU AND ME

This text was PRINTED on paper using a dot matrix printer. The printer received the ›raw‹ txt-file encoding the text as a string of letters, signs and spaces using 7-bit ASCII (American Standard Code for Information Interchange). A bit is a yes or a no, a zero or a one, an impulse or silence, a raised or resting arm, heads or tails... It does not matter what *thing* a bit is, what matters is its potential to clearly embody a discernible difference, a clearly distinguishable state. Every *thing* can be a bit. Seven bits can be combined in 128 different ways. These combinations are used in 7-bit ASCII to encode 33 non-printable control characters (Fischer 12–16) — such as

Start of Header,

Bell,

Line Feed, or

Cancel

and 95 printable characters:

!«#$%&'()*+.-./

0123456789

:;<=>@

ABCDEFGHIJKLMNOPQRSTUVXYZ

[\]↑_`

abcdefghijklmnopqrstuvwxyz

{|}~

space

The txt-file is 149 075 bytes ›heavy‹, translated into binary code it contains 471 327 ›zeros‹ and 538 636 ›ones‹. The printer decoded this information and composed each character by printing small dots in a 9×9 matrix. They are easily discernible. It turned 1001 011 into K , 1110 011 into s , and 1011101 into] . Again, these dots can be understood as bits, as ›ones‹ (printed dot) or ›zeros‹ (no dot). Although a 9x9 grid offers 2 417 851 639 229 258 349 412 352 possible combinations of printed and unprinted dots, not many of these combinations can be recognized as characters that convey meaning. There are only a few different fonts preset on the printer. They link each ASCII character

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with one particular combination of printed and unprinted dots and thus define that 1001 011 looks like this particular K .

The PDF you may see now was written using black and white scans of these dots printed on paper: an immensely complex digitalization of this invisible string of bits that I write by hitting the keys of my laptop, another, much longer invisible string of bits, an image of a translation.

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This text was printed on PAPER. The paper remains *evident* and *manifest*. (Unless you are reading this text in digital form, then it is only *evident*, as *manifest* derives from Latin, *manus* = ›hand‹ (›manifest‹), whereas *evident* stems from Latin *videre* = ›to see‹ [›evident‹]). However, if you read the text printed on paper, the paper may seem to become invisible, to lose its evidence while you read:

> Where is the book I held in my hands? It is still there, and at the same time it is there no longer, it is nowhere. That wholly object, that thing made of paper, as there are things made of metal or porcelain, that object is no more, or at least it is as if it no longer existed, as long as I read the book. For the book is no longer a material reality. It has become a series of words, of images, of ideas which in their turn begin to exist. And where is this new existence? Surely not in the paper object. Nor, surely, in external space. There is only one place left for this new existence: my innermost self. (Poulet 4) [1]

As you see here, if I take any text written or printed on paper, crumple it up and then flatten it out again, it is much more unlikely for the paper to become invisible in this way, to be actively filtered out, or repressed, the way George Poulet described. The text is still here, its abstract content unchanged, but the slight damage increases and thus brings to attention what can be described as the background noise of the material support of the writing, its *thingness* made explicit and palpable, *manifest*.

In *Thing Theory*, Bill Brown explains that we are seldom confronted with this thingness of things, as »we look through objects […], because there are codes by which our interpretive attention makes them meaningful, because there is a discourse of objectivity that allows us to use them as facts« (5). He describes the realization of the thingness of things as a rupture: we experience their underlying thingness when objects suddenly no longer comply according to these codes, when they disappoint the expectations we have in them:

> We begin to confront the thingness of objects when they stop working for us: when the drill breaks, when the car stalls, when the windows get filthy,

[when my computer does not boot up,
when the battery of my smartphone is empty and I am
relying on it to find a place I have never
been to before,
when my screen cracks,
when I cannot show my slides because the adapter
for the projector is missing,
…]

1 Bonnie Mak likewise notes that »despite its central role in the transmission of thought, the page often passes without registration or remark. So habituated to its operation, we often overlook how the page sets the parameters for our engagement with ideas« (9).

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> when their flow within the circuits of production and distribution, consumption and exhibition, has been arrested, however momentarily. (Brown 4)

But the crumpled paper here is less a rupture than a noise. Although the crumples obstruct the process of objectification, they do not arrest or silence it. The crumpled paper does not *re*sist objectification (the text has not become completely unintelligible), rather it *in*sists on its own significance in the process of objectification; here: of playing its part in how printed dots are disregarded individually in order to become meaningful constellations, signifiers pointing at something beyond themselves: a text. (The crumpled paper plays *along*, making the text it sustains less stable and sound.) The insistence of *things* produces friction. Things insisting on their thingness demand an increased level of attention, putting to the test the automated and unconscious mechanisms of our reading them. Karl Schawelka refers to this as »frustrated synthesis«: the cognitive process of turning sensory information into meaningful objects is impeded, the mind has to work harder to grasp what reality is confronting it with (26).

A thing is both more and less than an object. As Brown notes, things »hover over the threshold between the nameable and unnameable, the figurable and the unfigurable, the identifiable, and the unidentifiable« (Brown 5).

›Object‹ can be translated as *Objekt* and *Gegenstand* into German. (Both words are often used as synonyms (HD). *Gegenstand* literally means »that which stands against«, »that which opposes something« (ibid.). Thus *Gegenstand* indicates a relationship: some thing opposes (the subject). It is never just by itself. It exists as an opposition. The word ›object‹ has a slightly different meaning. It derives from the Latin word *objectum*. The prefix *ob-*, translates as »in the way«, *iacere* is ›to throw‹; the *object* is »that which is thrown in my way« (›object‹). An *object* is actively moving, it is a projectile, its movement causes an effect. *To object* is to actively oppose someone or something, to become a *Gegenstand* in order to stand against someone or something. While the object is thrown at me and I have no choice but to deal with it, the *Gegenstand* is static and calm (although not passive) in its resistance. It does not move, it stands. Immanuel Kant subtly differentiated between *Objekt* and *Gegenstand*: A *Gegenstand* exists as an experience, as a product of sensory data. It is not (yet) necessarily *cognized* by the understanding. An *Objekt* exists because it has been *re*cognized by the understanding. It is the synthesized *Gegenstand* (McWherter 157). Looked at this way, a *Gegenstand* could be regarded as being in between things (the thing-in-itself cannot be known, it lays outside of cognition) and objects (Eisler »Objekt«). For Kant, a *Gegenstand* is that which is experienced but which is not (yet) meaningful; it is being grasped while it withstands. It can only be grasped *because* it withstands. The withstanding of the *Gegenstand*, that which stands against the subject in the process of cognition, is

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its unknowable, unprocessable thingness. Even though this thingness cannot be realized itself, it remains apparent in the opposition it causes.

Brown's idea of a *thing* could thus very well be understood to mean a *Gegenstand* in the Kantian sense. However, since my aim is to put my finger more on that which causes the *Gegenstand* to stand against, and not so much on the subject it is standing against, I will continue to use the word *thing* in this text. In accordance with Brown's idea of »Thing Theory« and Daniel Miller's notion of *Stuff*, I understand things to be the *stuff* of everyday life that cannot fully be grasped by our understanding.

When I see the object I do not see the thing, I see what I can *re*cognize in the thing, what it reminds me of. The object is more a reflection of my memory than something outside myself. Daniel Miller notes that objects are significant »precisely because we do not ›see‹ them. The less we are aware of them, the more powerfully they can determine our expectations by setting the scene and ensuring normative behaviour, without being open to challenge. They determine what takes place to the extent that we are unconscious of their capacity to do so« (*Materiality* 5). The thing that makes an object recognizable can be experienced but it cannot really be described. The insistence of things and the friction it produces lets them reappear out of oblivion.

Just before Roquentin, the protagonist of Jean-Paul Sartre's *Nausea*, has his famous epiphany over the roots of a chestnut tree and finds »the key to Existence« (129), his objects and words already begin to fray and disintegrate when he sits in a tramway:

> I lean my hand on the seat but pull it back hurriedly: it exists. This thing I'm sitting on, leaning my hand on, is called a seat. They made it purposely for people to sit on, they took leather, springs and cloth, they went to work with the idea of making a seat and when they finished, that was what they had made. They carried it here, into this car and the car is now rolling and jolting with its rattling windows, carrying this red thing in its bosom. I murmur: »It's a seat,« a little like an exorcism. But the word stays on my lips: it refuses to go and put itself on the thing. […] Things are divorced from their names. They are there, grotesque, headstrong, gigantic and it seems ridiculous to call them seats or say anything at all about them: I am in the midst of things, nameless things. Alone, without words, defenceless, they surround me, are beneath me, behind me, above me. They demand nothing, they don't impose themselves. (Sartre 125)

Brown writes: »The story of objects asserting themselves as things, then, is the story of a changed relation to the human subject and thus the story of how the thing really names less an object than a particular subject-object relation.« (4)

The thing is strange. All I can do is try to *figure* it out. But things are underwhelming. The friction they cause is not productive, their noise does not make sense. The thing remains absurd. It reveals not itself but a disturbing excess, an indigestible residue. It is a

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bother, potentially even uncanny (cf. Trigg). The futile action of reaching out in the attempt to objectify it, to pin it down using language, lets it become apparent as a rift: It is identifiable only as that which is not like anything else. It cannot exist as a concept. It is here because I am here struggling with it. Thus, this underwhelming encounter with things refusing to shut up entails a chance of sublimity, a chance to experience the process of realization, of watching oneself recognize. For Kant, the sublime was not the beautiful *per se*, but rather connected to the realization of a »super-sensual capability«, which enables an intellectual transcendence of the resistance imposed on us by the harsh and overwhelming physical world. Due to its unfathomable size, the superiority of our environment leads to the realization of our cognitive faculties. This realization is the sublime (Eisler »Erhaben«). Kant exemplified this with the overwhelming experience of standing by the sea and watching the power of the waves. As the subject feels overpowered and helpless, he or she may realize that it is in fact he or she who realizes this overwhelming vastness and inconceivability after all.

I would like to argue that the same realization is possible when the subject is underwhelmed; the absurdity and unintelligibility of silent and stubborn things, of obsolete objects, is much more easily brushed aside and ignored than the breaking of big waves; nevertheless, small things may cause a similar, albeit much quieter feeling of being lost or impotent. [2]

It may be too bold to claim that a crumpled page has the potential to galvanize us out of self-oblivion. However, its stubbornness strikes me as an extraordinary banality: in this thesis, as in almost any other book, all pages with text on them look roughly the same. Usually, they are all printed on the same paper, the layout of the text does not vary. Following typographic standards, this establishes a visual grammar, which helps to orient and focus the reader; to silence the noise of the thing. ›Decluttering‹ aids to foreground the text and its abstract content. [3]

This abstraction through noise reduction *trajects* the content; it is not *thrown in my way*, but *across* (›trans‹). My head intuitively turns

2 The Japanese language has a rich vocabulary to grasp this endurance of the underwhelming noise of sheer things. To give just one example: the term /aware/ »is applied to the aspects of nature (or life, or art) that move a susceptible individual to an awareness of the ephemeral beauty of a world in which change is the only constant. His or her reaction may be a resigned melancholy or an awe, or even a measured and accepting pleasure« (Richie 52).
See also: Francesco Orlando's extensive study /Obsolete Objects in the Literary Imagination. Ruins, Relics, Rarities, Rubbish, Uninhabited Places, and Hidden Treasures./

3 As a trained typographer, I am intimately aware of the standards of written communication. Typography is the attempt to give language a (reproducible) form. Good typography—in the eyes of many—makes the traces of the work of the typographer invisible: it lowers the noise of the materials of the text. A typographer manipulates this material to communicate ideas effectively. In order to do so, I need to get in touch with those materials of communication: this once meant setting actual, tangible lead characters, today it means to handle digital tools. I think it is fair to say I have what Richard Sennett calls a »material consciousness« for text (120).

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away from the source of this movement, and I begin to wonder where the meaningful object might strike next. The writing is meant to transcend its substrate. As leaves of paper become pages, they fade out of attention and thus seem to become invisible; the words they contain are thought of as disembodied thought, bodiless effects. Vilém Flusser called this — in his opinion »problematic (doubtful)« (50) — attempt to lead the reader's attention by removing distinctions »typification«. Without typification, reading would be impossible:

> Something printed is a typical thing, and not a distinctive, incomparable, unique thing. A printed paper is a specimen, one among many examples of one unique thing (e.g., of a manuscript). Something printed is valuable not as a distinctive object (as this singular piece of paper) but as a type. The interesting thing about it is not the production of print (of papers, of printed writing) but the production of the types (of the text). (51)

These crumples here activate and single out a page, hindering its abstraction and thus the abstraction of its content. The crumples re-individualize the page–it is not typical anymore. But no *thing* is added or taken away. The thing itself, the paper, has been crumpled; it has been *in*-formed. Flusser points out that »*to inform* originally meant ›to dig forms into something‹« (12) Understood this way, form is not solely abstract and conceptual but realized through a cognitive act of extraction: the effects resulting from the formation of some *thing* are recognized and foregrounded, the ungraspable thing sustaining them becomes a background-noise. This *in*-formation of the page-paper-thing causes what I have just described as an unproductive friction, an irritation, slightly frustrating the reader's synthesis, their hermeneutical endeavour. The crumples *re*-present the paper. They make apparent that the paper was there all along, a sustaining support, whose silencing through typification makes the meaning of the text possible. These crumples are nothing like Kant's waves. They are not *awesome* and *terrific*. However, as they disturb the flow of meaning, they might have the potential to reveal the unbridgeable existential gap between the things we encounter and the ideas we recognize in them. Beyond our frustration about things not working the way we want them to, there is a chance to realize how entangled we are in them, that making sense does not come ›naturally‹.

The body of digital media cannot be foregrounded by crumpling it like a page. It is even more successfully rendered ›invisible‹. In this research project, I sought ways to foreground the sustaining material support of digital devices, and their role in the hermeneutic process. How can their thingness be revealed, in the construction of meaning across an interface? The potential emptiness of a screen (or a digital projection) is clearly very different to the emptiness of a sheet of paper. The aim of this thesis is to investigate this difference.

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As I know that I cannot crumple digital interfaces as I can crumple a page, I make this futile attempt the focus of my inquiry. I try to be as insisting as the things that sustain meaning. My practice is concerned with the distance between the act of (*in*-)formation and understanding. I approach things that have been *in*-formed to behave as digital machines and look at their effects, the only superficially immaterial *in*-formation they produce. I reflect my own position in this entanglement by actively and often futilely attempting to (re-) insert myself in the ungraspable processes of digital translation. I investigate if Flusser's claim that the »absurd objective world is stronger than the subject's will to inform it« still holds true today, now that with highly advanced and ubiquitous digital interfaces, the literal *in*-formation of the physical page has become an abstract matter of resolution concerning bits lighting up pixels.

> But as my eyes fell on the pad of white sheets, I was struck by its look and I stayed, pen raised, studying this dazzling paper: so hard and far seeing, so present. The letters I had just inscribed on it were not even dry yet and already they belonged to the past. [...] I had thought out this sentence, at first it had been a small part of myself. Now it was inscribed on the paper, it took sides against me. I didn't recognise it any more. I couldn't conceive it again. It was there, in front of me; in vain for me to trace some sign of its origin. Anyone could have written it. But I... I wasn't sure I wrote it. The letters glistened no longer, they were dry. That had disappeared too; nothing was left but their ephemeral spark. (Sartre 95)

Looking at a sheet of paper through the conceptual lens of digitalization may serve to reveal something about the preconceptions of the observer. I stubbornly resist seeing objects as interchangeable equals — this A on my screen here is not this A ; it is neither the electrical charges stored on my hard disk nor one of the letters you see printed out right now. How come I take the portion of an illuminated white rectangle in my text editing software, the contents of the screen of my e-ink ebook-reader or a PDF-file to be a page? How does this experience change the way I think about the objects sustained by the paper of a page in a book? How come I see that and this A as equals, even though the very *Gegenstand*, the thing sustaining them, has radically changed?

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ON STRUCTURE

This thesis consists of two parts. The first section, titled THE CONDITION, is a phenomenological and theoretical questioning of the computer as a thing.

First, (1.1) I *approach* it metaphorically. I compare computers and their interfaces with other worldly things: ruins (considering the existence of the machine, its resting body, and the expectations and promises it entails), vessels (thinking about function), and windows (reflecting on the notion of digital transparency and contingency). Then, (1.2) I verbally *enter* the computer. I write about how the Turing machine came to embody and perform language by turning everything into writing and how it itself relies on written structures.

The space of language is the space between things; language relates things by denoting them but fails to grasp the thing itself. In this first section, I collect ideas and define a set of terms to stake out this ambiguous, inter-textual space as the background for my practice, a room I go on to furnish with things that cannot be put into writing.

I begin the second part, titled THE CONCERN, by (2.1) revisiting Mel Bochner's mural »No Thought Exists Without A Sustaining Support«, which has had a major influence on my work. I describe how Bochner's work can be understood as making things embody and perform concepts. I then speculate about how his post-conceptual sensibility could be related to the so-called post-digital condition: *Things* re-emerge as it becomes apparent that there is always a physical remainder that cannot be wholly conceptualized.

I follow by concisely introducing my practice as a series of exercises in grappling with the evasive body of digital media. I describe the conceptual journey that led to the individual projects, moving from questions and complications on the process of (digital) translation (2.2) and the physical act of *in*-formation (2.3), to interfaces as things (2.4). I regard the results of these exercises to be more than illustrations or materializations of the terminology I establish in the first section; I want them to become extensions of the linguistic inquiry into this thing that I constantly forget is here in front of me.

I include my work as reproductions, consciously regarding this inclusion as an act of writing things as images, of turning what I intend to show as distant things into digital objects once more, before they are printed. The individual pieces appear several times in different forms, to raise questions around the links between them. The physical existence of the reproductions (as things) is what sustains the inter-references between the works and the text that I am interested in.

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Theodor Adorno notes that »indirectness can no more be hypostatized than can the poles of subject and object; it is valid only in their constellation. Transmission is transmitted by what it transmits« (N 99). For Walter Benjamin »[i]deas are to objects as constellations are to stars« (O 34). In this way, I view the thesis as a constellation following Adorno and Benjamin's ideas of constellations as a means to break binaries, and so also the idea of self-identicality. Rather than trying to directly identify a thing or situation, (to argue inside a framing structure or against it by trying to step out of it) they suggest *encircling* it. Since language eventually always fails to be completely abstract and objective, because it always — ever so slightly — misses its target, Benjamin and Adorno proposed using its abstracting trajectory to address the thing in question by retracing the multiplicity of its relations. I can only point at the ontology of digital objects, I cannot reduce it to the blueprints of computer chips or images of servers or by printing out binary code as zeros and ones. By associating things and ideas both conceptually and visually (through choices in layout and various numbering systems) I hope to evoke the material and cognitive friction that occurs when things are translated into and out of (digital) objects — the thingly space of (digital) transmedialization.

To continue this cross-referential approach, I am including reproductions of artworks by other artists and a few found images that resonate with certain passages of the text. The artworks appear as literal screenshots, digital photographs that show how I accessed the documentation of the work online as a digital object. I think of those images as interjections. In the ›hard‹ copies of this text they are presented on smaller pages, as things amongst things.

I conclude the thesis by contextualizing my questioning within the wider debate on the contemporary digital condition, to ask: are we witnessing a *resolution* of existence?

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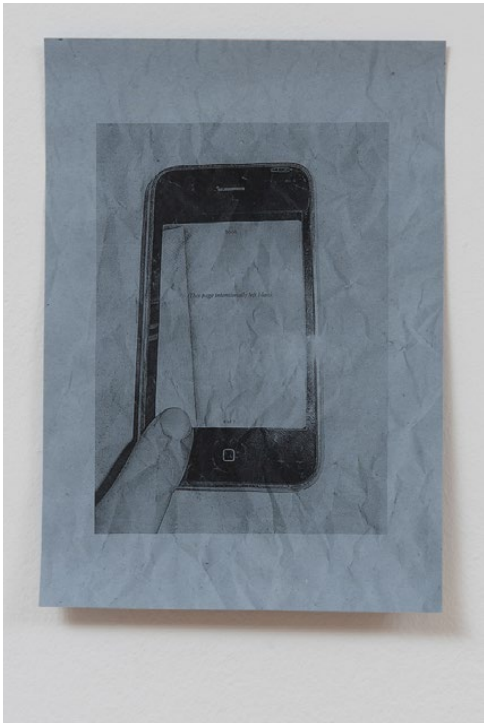
A [INSTALLATION EMPTY/BLANK AT THE RCA WIP SHOW

At the Work-in-Progress-Show 2013 I showed the empty print (a) in constellation with (b) a print of a scan of a crumpled print of a digital photograph showing my slightly battered smartphone as I am ›flipping‹ a page in an ebook on the device. The text on the screen reads: "This page intentionally left blank." On the floor underneath is (c) a cardboard box full of hand-written notes I found on the street. It is set on a library copy of Flusser's *Does Writing Have a Future?*.



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[APPENDIX B SNOW

The page inserted after this one is a cut-out from test print of the large lino-cut.

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[APPENDIX C. 1 THE INFORMATION I — FILM STILLS

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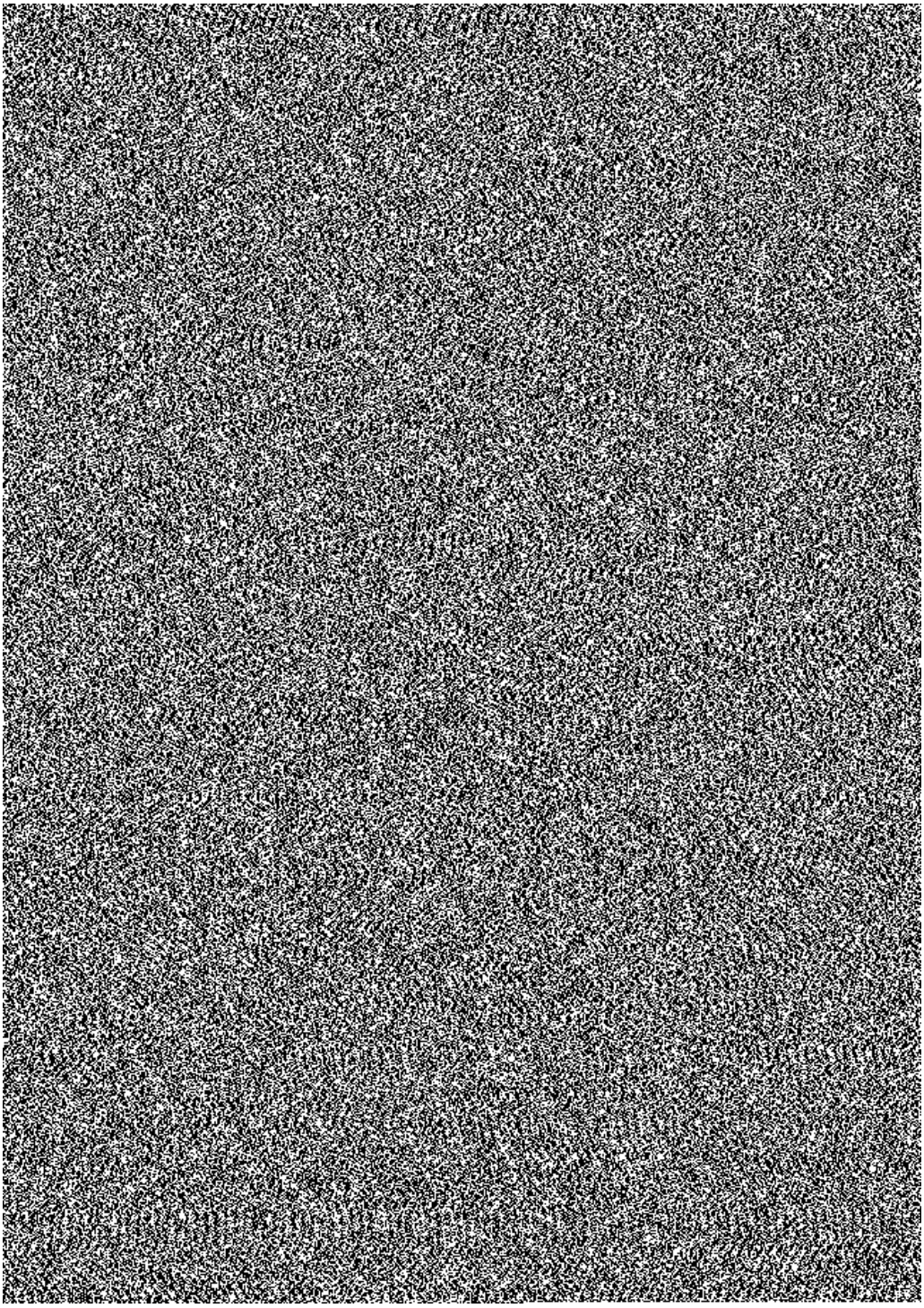
[APPENDIX C. 2 KUNSTWERK



I translated the German text of Benjamin's essay The Work of Art in the Age of Mechanical Reproduction from ASCII into binary code, into a string of zeros and ones. Since a string is notoriously hard to depict, I decided to turn it into a two-dimensional bitmap. I added line breaks to let it flow into the proportions of the standard paper size. The resulting image is more like noise than information. In this form, the essay cannot be easily accessed by humans or computers. The meaning of the text is lost in (digital) translation, it is stuck in a limbo of formal material.

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[APPENDIX C. 3 THE INFORMATION I.
PREVIOUS INSTALLATION OF BOOKS

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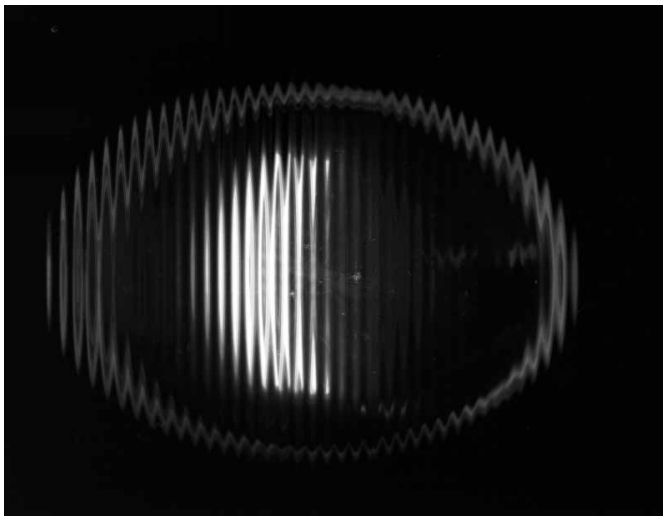
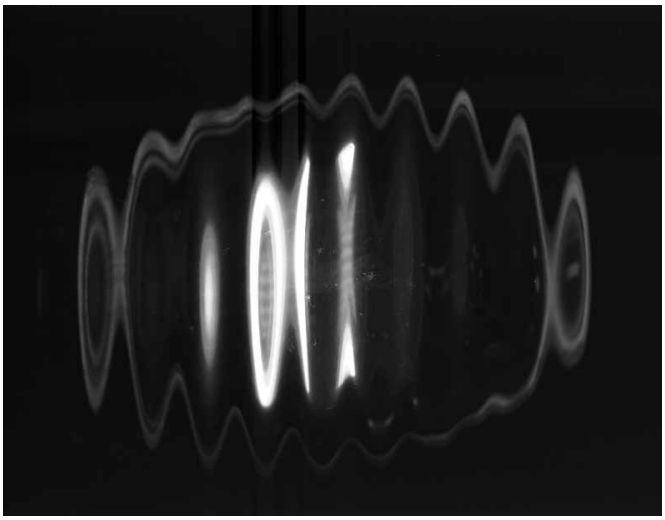
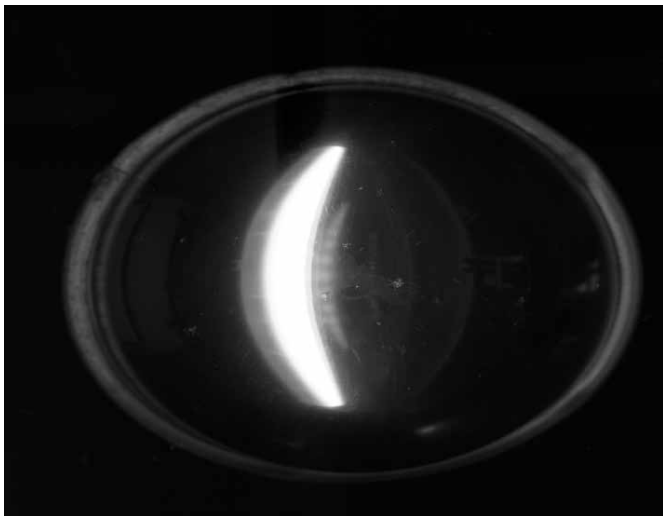
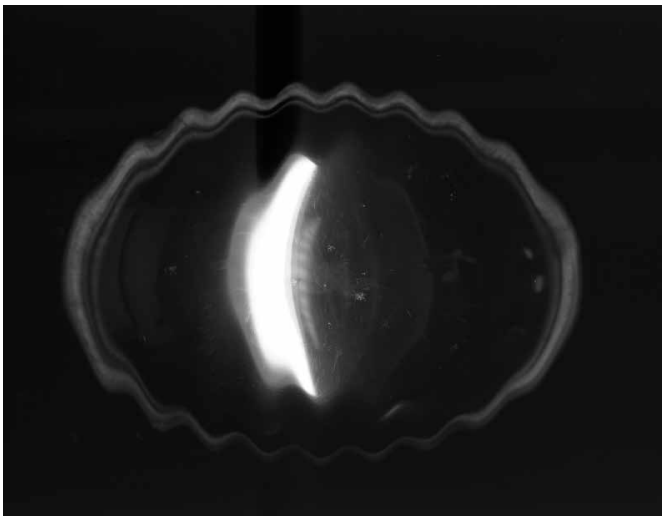
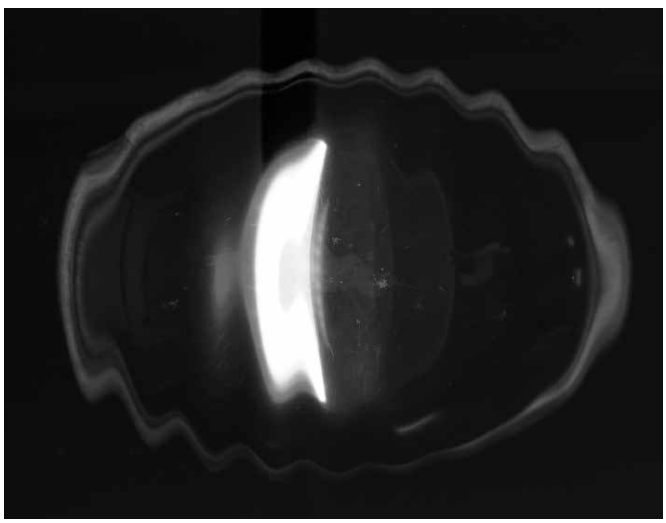
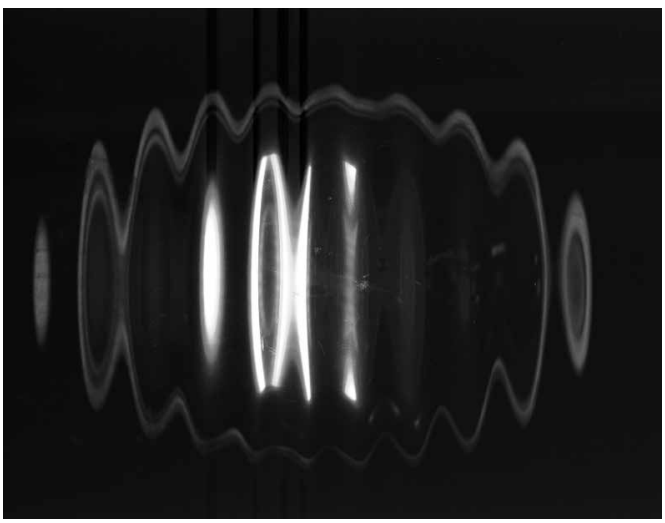
[APPENDIX D SCANNER EXPERIMENTS

1 convex mirror, rocking on glass of scanner while being scanned

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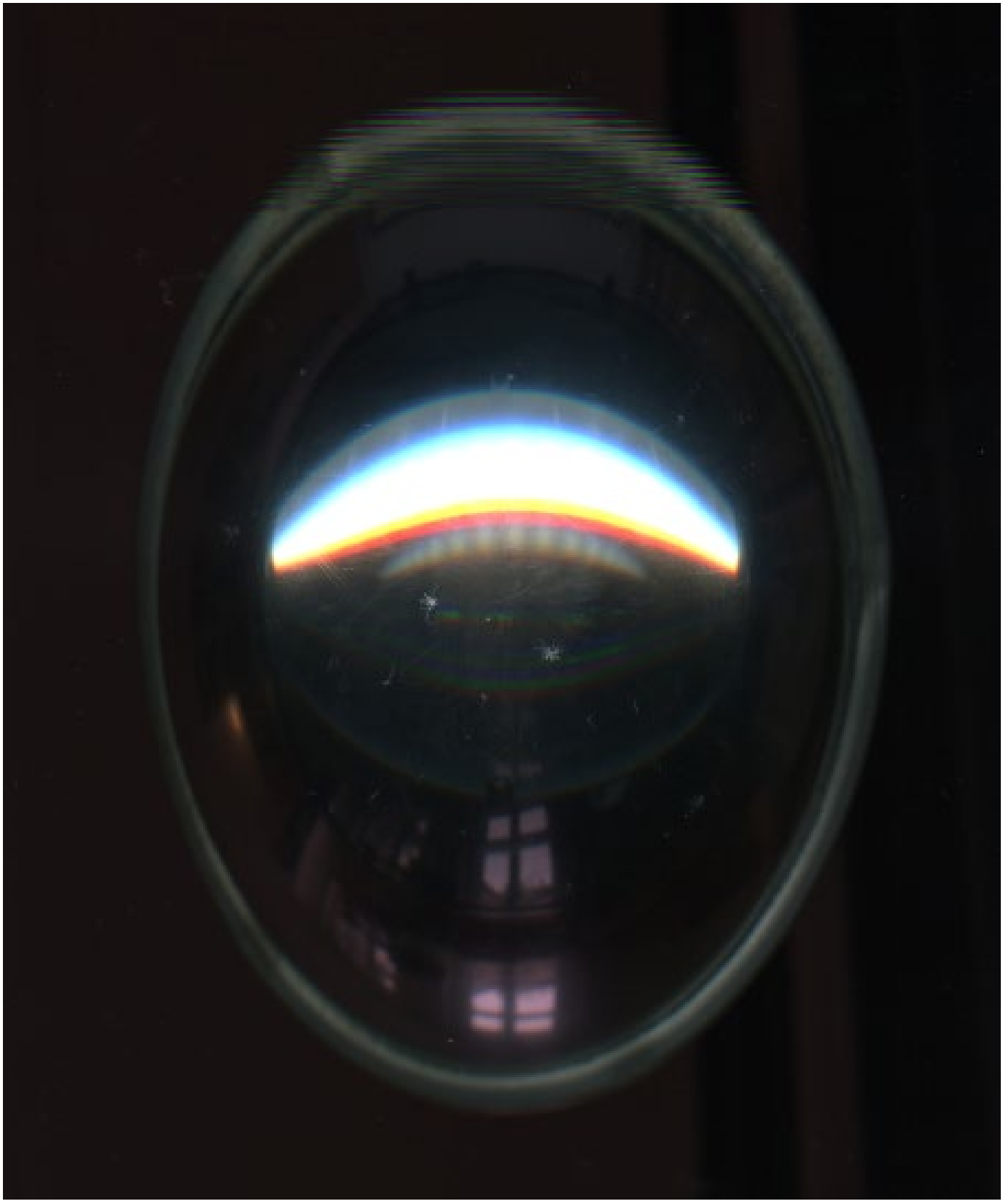
2 convex mirror. (slight movement, at top), caught (1) the reflection of the light sensor, (2) the reflection of the light shining through my studio window in the (3) mirror, and (4) the reflection of light shining through my studio window reflected on the table



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3a scan of digital camera facing away from the glass, towards a mirror.
Film documenting the scan

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3b resulting image of digital camera while being scanned and catching its own reflection in the mirror.

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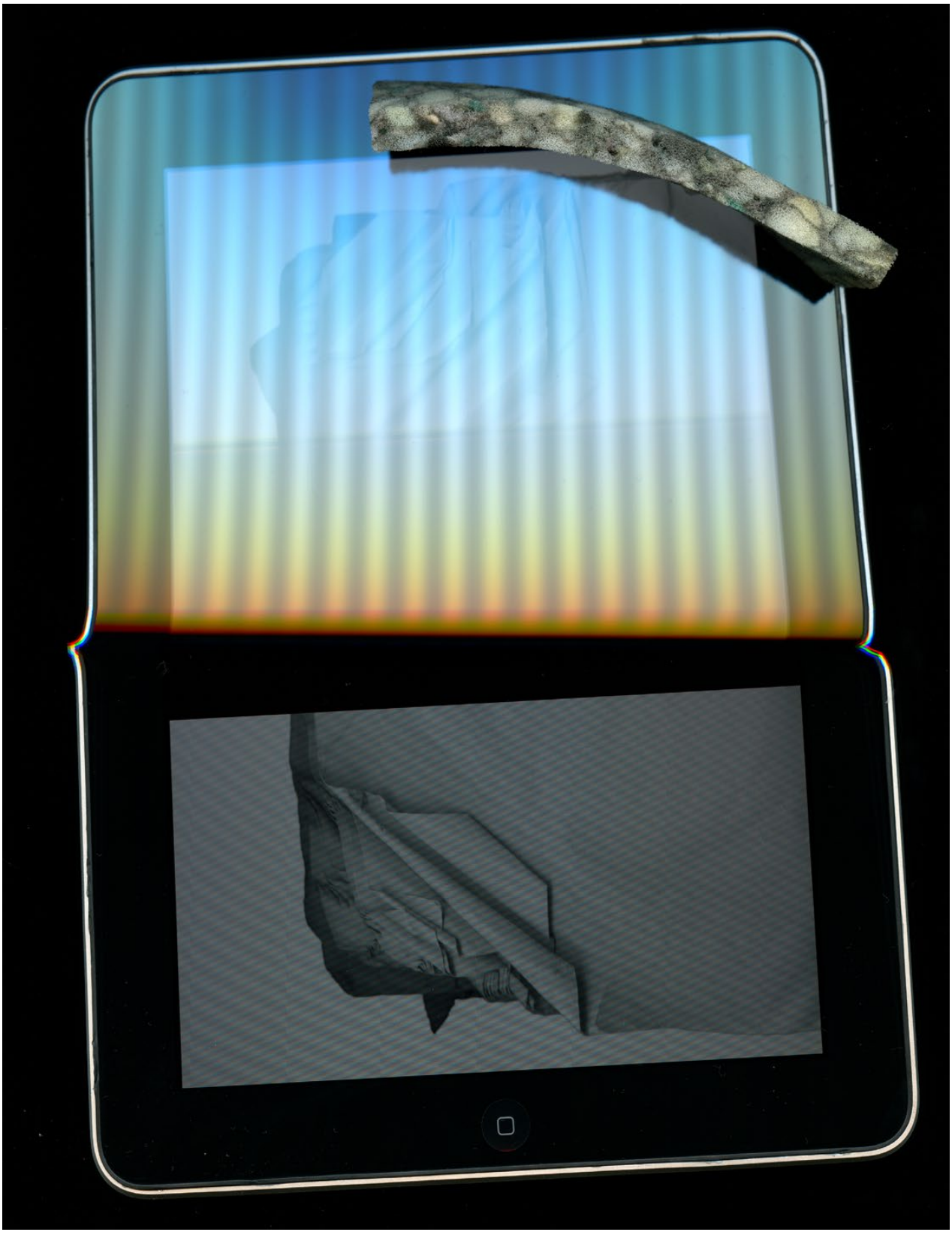
4 Scan of iPad (later turned into the sausage) that shows a page of the ebook of /The Information I/, positioned on piece of foam that slightly moved while scanning and fell over during the scan.



[APPENDIX E. 1 TECHNIQUES OF THE OBSERVER

The following spread shows a part of the tiled image of one of the scanners scanning the other.

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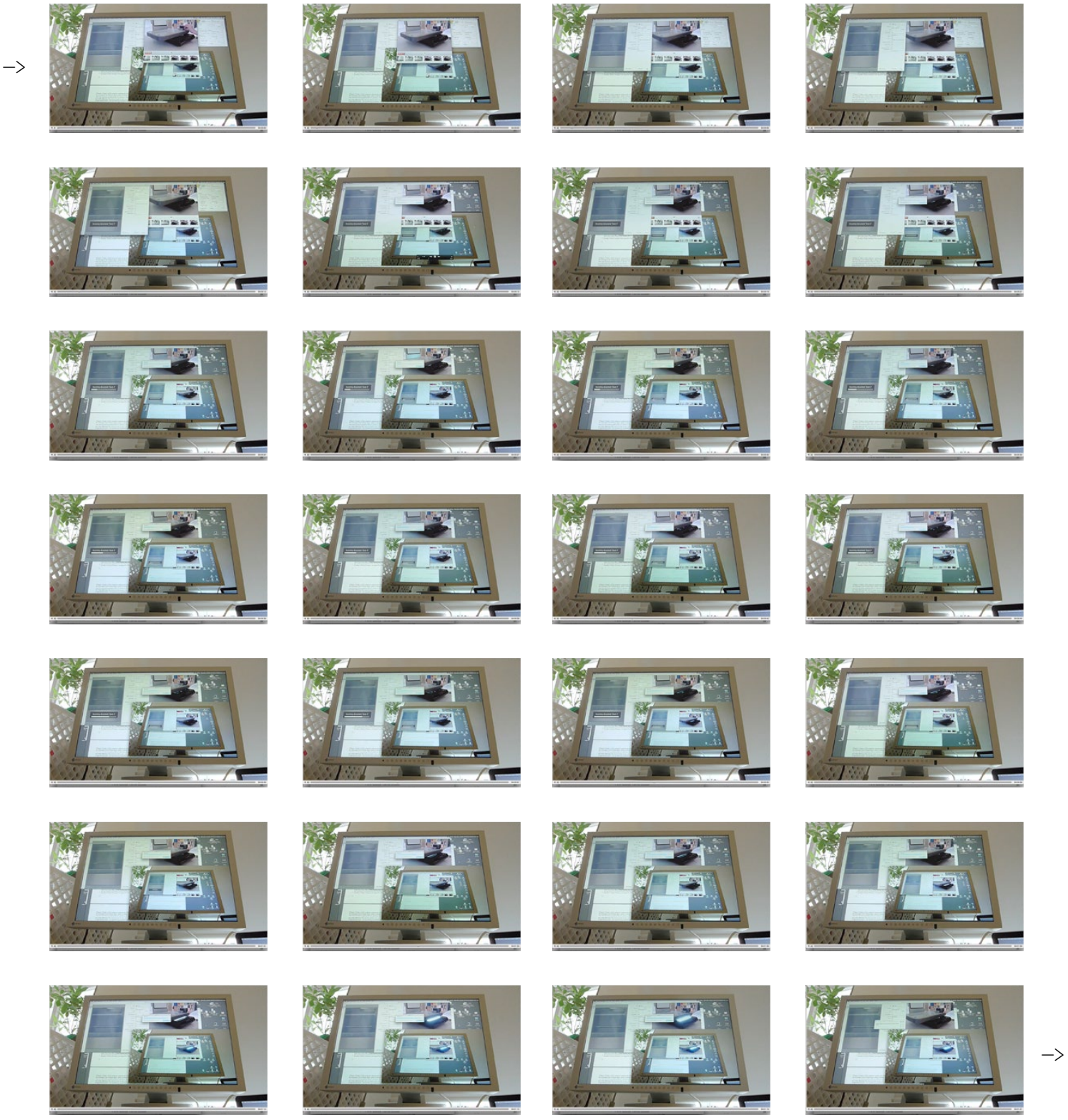
[APPENDIX E. 2 TECHNIQUES OF THE OBSERVER — FILM STILLS



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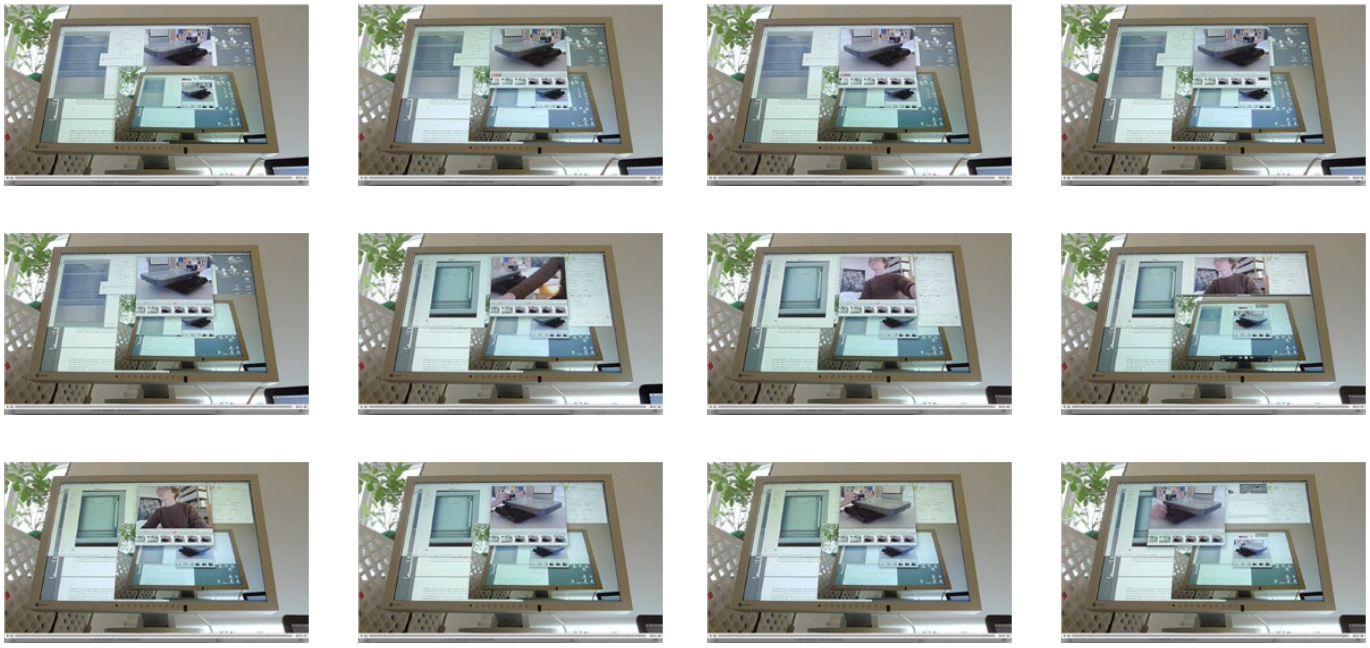

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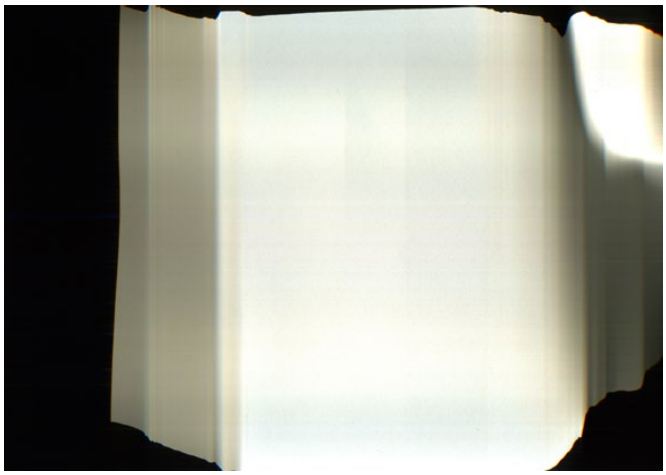
[APPENDIX F. 1 THE INFORMATION II (all 25 scanned images)



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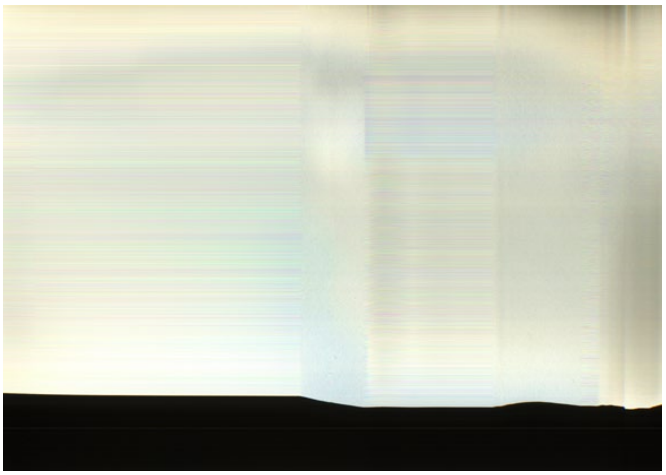

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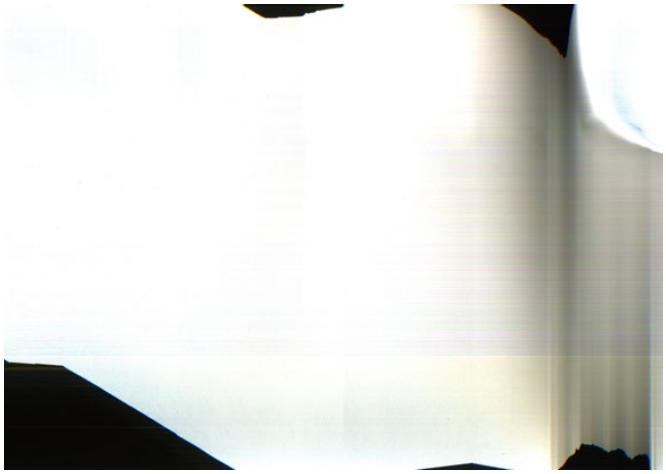

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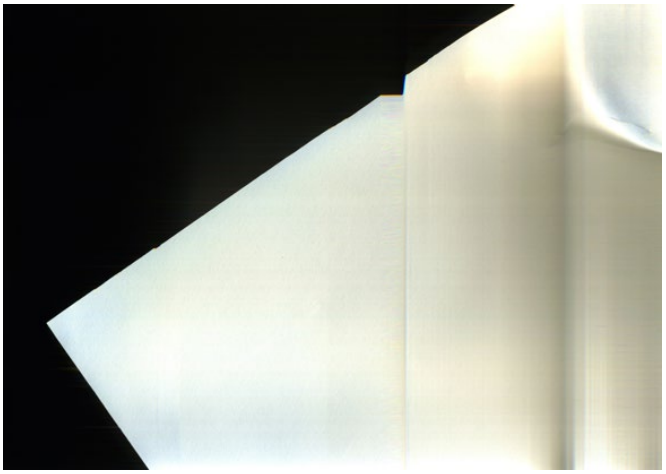

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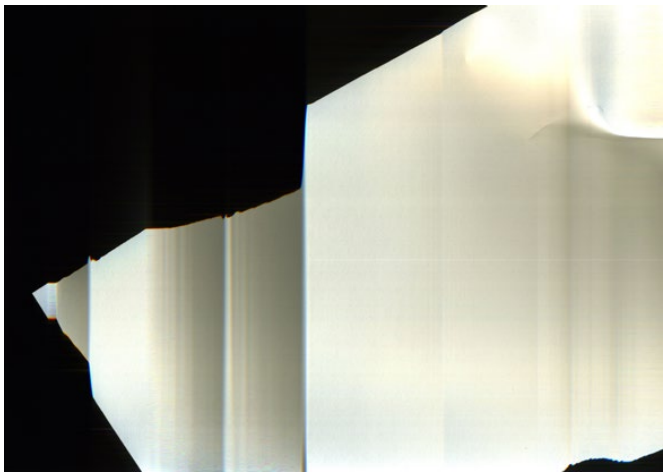

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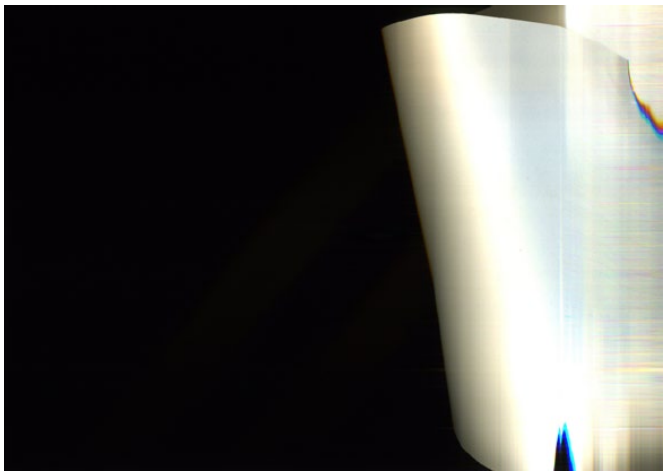

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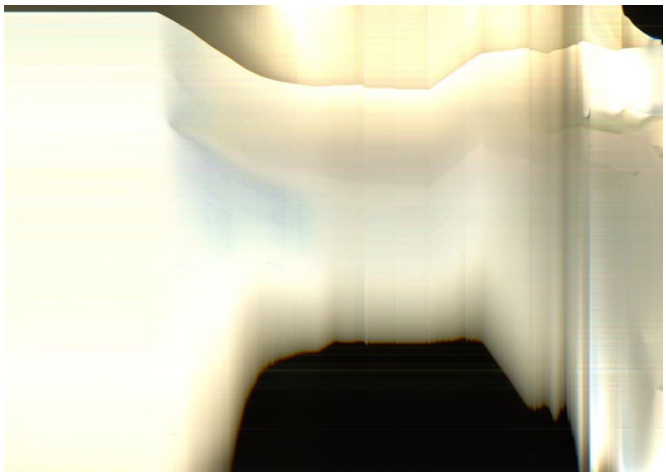

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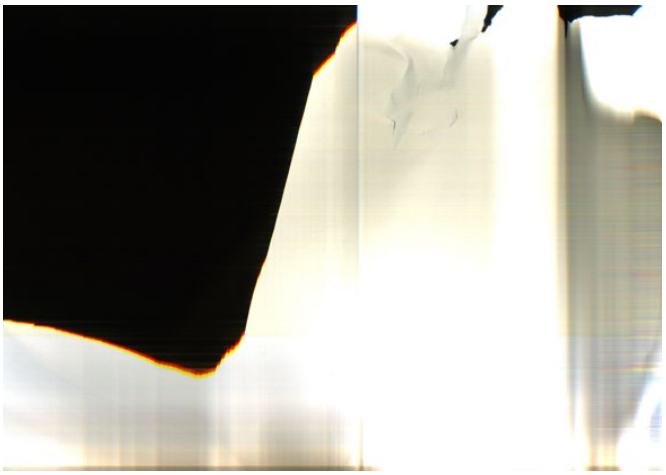

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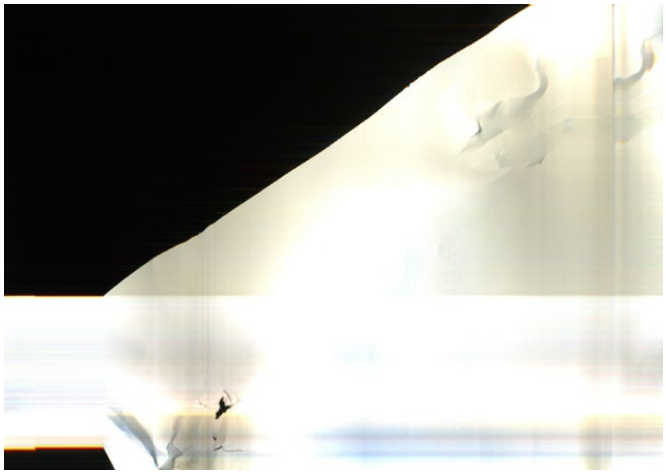

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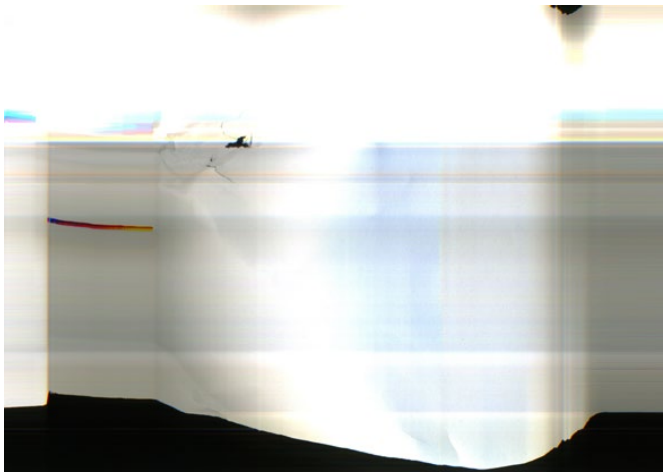

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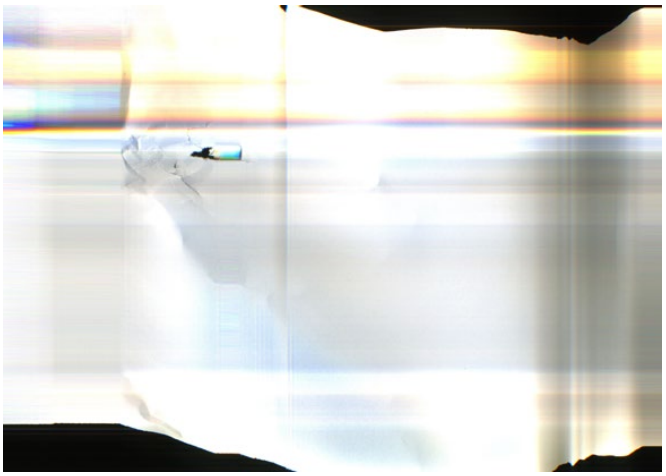

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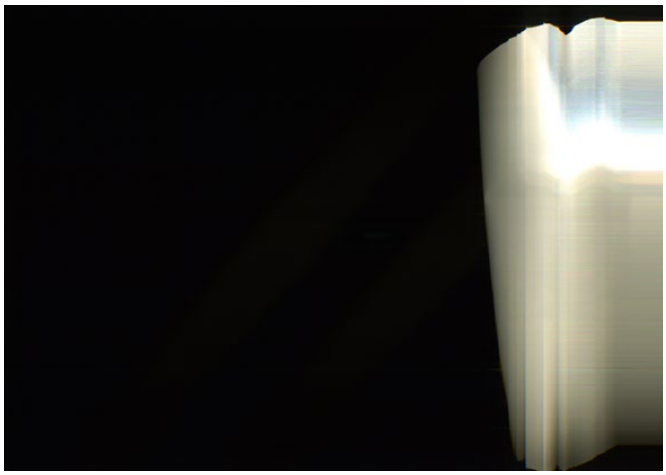

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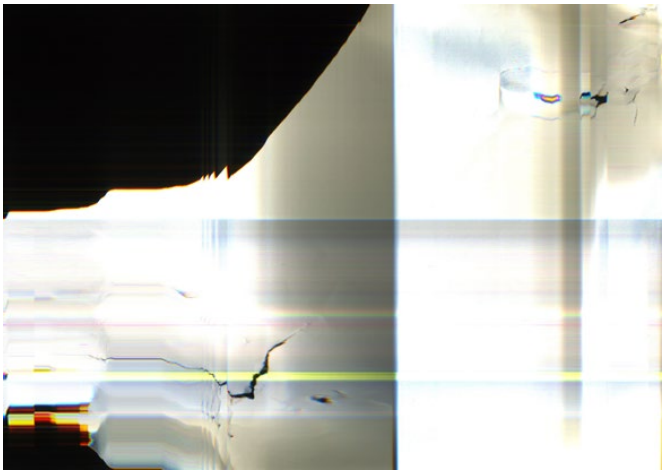

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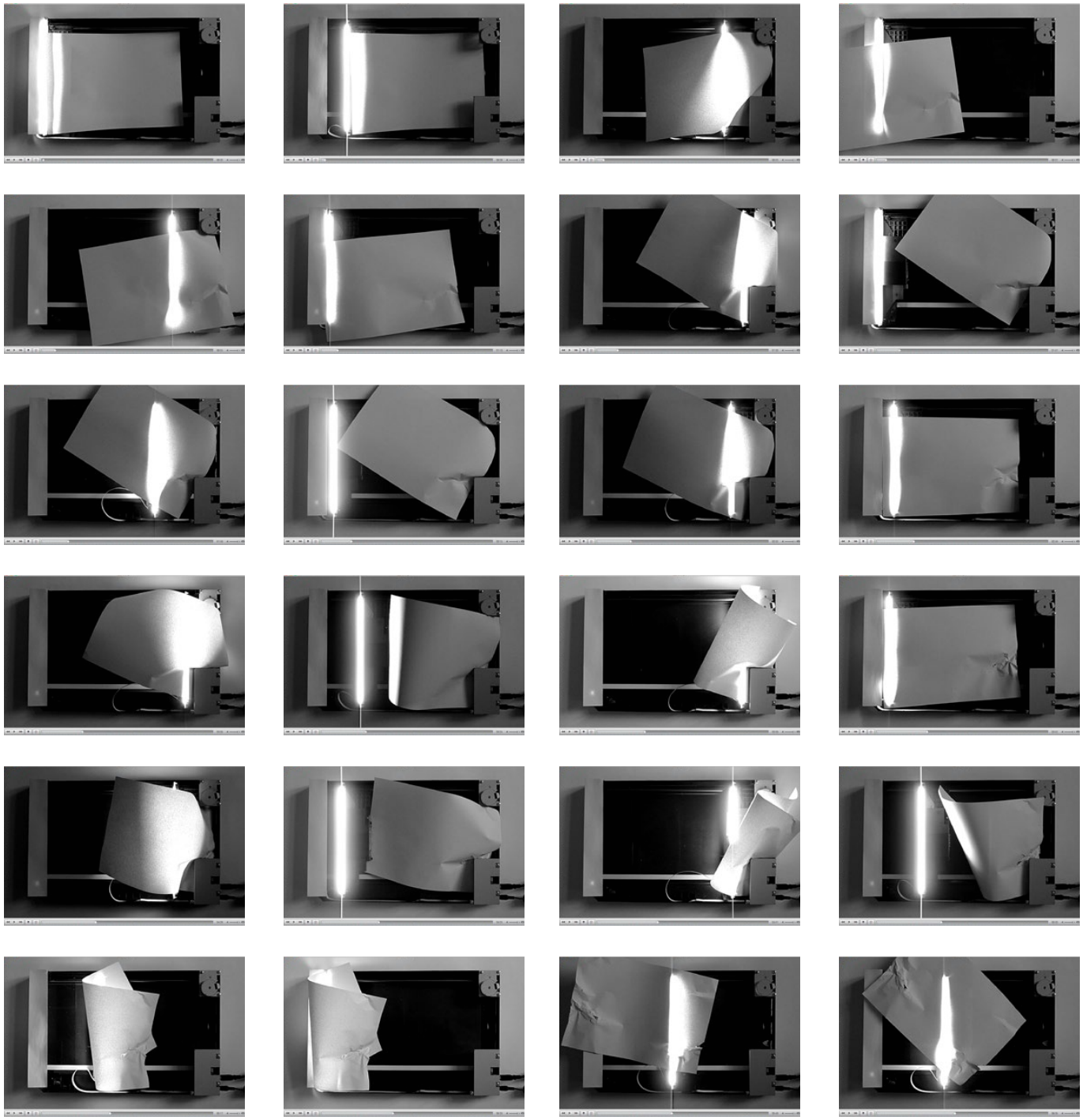
[APPENDIX F. 2 THE INFORMATION II — FILM STILLS



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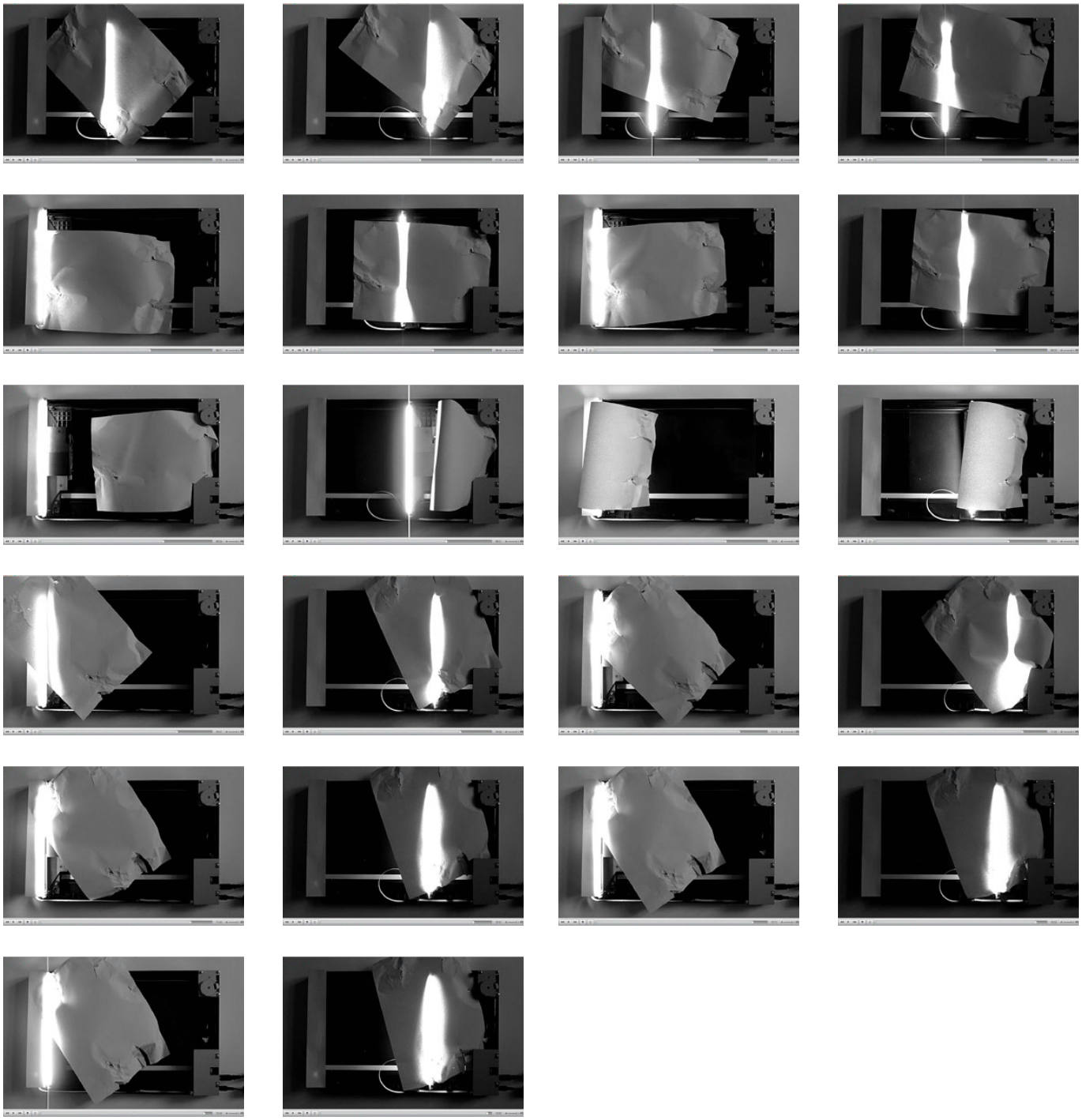

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[APPENDIX F. 3 TECHNIQUES OF THE OBSERVER

scan of damaged paper

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[APPENDIX G LITERALLY - FILM STILLS

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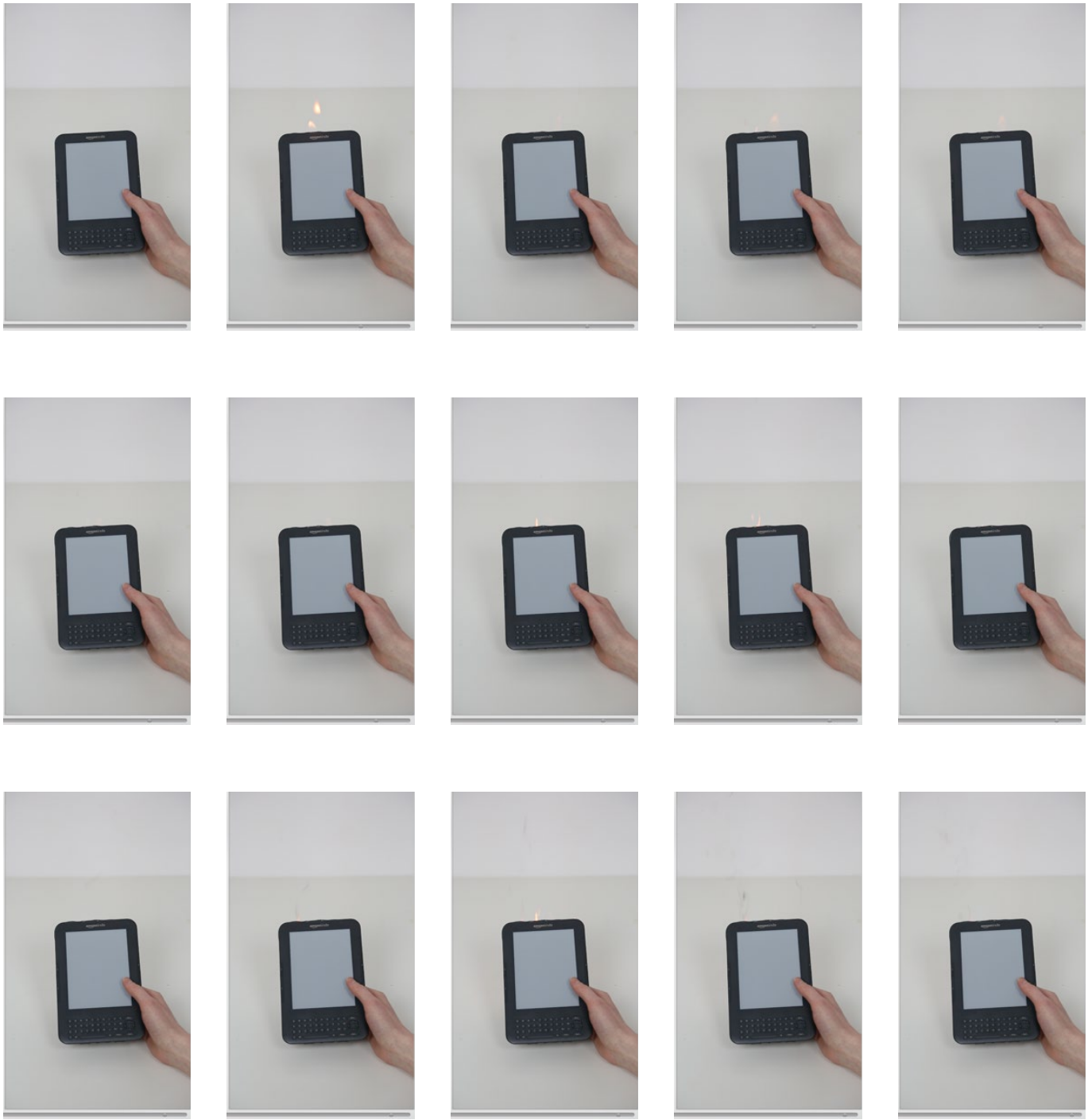

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[APPENDIX H

ENCOUNTER ONE.

He is standing at a self-checkout machine in a supermarket. The man at the machine next to him wants to buy a piece of cheese. The man scans it. The machine tells him that assistance is needed. A member of staff arrives promptly. The employee scans the product once more. She looks at the screen and then tells the man that she is not allowed to sell him the cheese. She says she is sorry. She does not know why, but that this is how it has to be. The computer system seems to know more than her. She does not need to know, and does not really seem to care to know either. She obeys the system and withholds the cheese. She apologizes once more and takes it away.

He wonders what she will do with the cheese. Is it really cheese? Maybe the fact that it is not processable, not scannable, not sellable, puts it outside the realm of language somehow, he thinks. Does it actually exist? After all, it appears to be unknown to the perception, to the logic, to the understanding of the machine. The computer does not recognize it. Rendered unsayable, it thus ends up in an unacceptable state of limbo. The machine rules that staff need to do away with it, whatever it might be. And the staff comply.

The computer is clearly in command here. So who knows, if the computer fails to know? Perhaps it is a fatal error rather than cheese, he thinks. Surprisingly, the man accepts the computer's decision without any objection and calmly goes back into the shop. He assumes the man will try his luck with another piece. He wishes him the best of luck that the computer will let it pass as cheese this time.

»Have you swiped your Nectar card?«, the machine asks him as he is allowed to take all his items with him. He leaves with the strange feeling of having witnessed an authoritarian side to the self-checkout machine. He could clearly hear its friendly voice paraphrasing: »Computer says No.«

He muses that it is quite ironic that of all things it is cheese that goes against the grain of the system here — assuming that it *is* cheese, and keeping in mind that the computer does not know if it is cheese or not — as cheese has a longstanding tradition of being imitated.

He once read that cheese analogue can be made without any traces of milk at all. To make it, often everything but milk protein is replaced with vegetable oil. But even the milk protein can be substituted. He remembers that it struck him finding out that it is illegal in the EU to label such a product as ›cheese‹, if milk fat has been completely substituted for other fat. In the EU cheese must be made from milk to be allowed to be called ›cheese‹. It must not even be named ›imitation cheese‹ or ›cheese analogue‹, since

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the word ›cheese‹ is only allowed to be used for products containing ›real‹ cheese. Instead it is called ›Pizza Mix‹ or »vegetable oil and protein mixture for melting«.

Smirking slightly, he ponders over the fascinating idea that a product that is made to be an image of cheese, looking, smelling, feeling, melting and (more or less) tasting like cheese, is nevertheless not allowed to be called ›cheese‹. It too has become an unsayable thing. It came very close to be similar to something that it is not actually supposed to be. As an index, a medium, it tries to convey the information of cheese without actually being cheese; a solid, chewable, and meltable echo of cheese.

Swaying his bag, he returns to contemplate the authoritarian self-checkout machine. The basic set-up of these machines is simple, he thinks. As he scans the product, the lighter, normally white areas of the barcode area reflect the light of the scanner. The scanner immediately registers this reflection and ›reads‹ it as a number. The computer then looks up the number in a catalogue, where it has been linked with a price and other relevant information (such as the name of the product). This information is displayed on the screen. Once the product has been identified, he has to put it into the ›bagging area‹, where a scale monitors if the weight of the scanned item matches its expected, preset value. If it does, the price is added to the bill. The machine does not care if he buys a pineapple, toothpaste, sausages, condensed milk, sandwiches, walnuts or toilet paper, ham, chicken breasts, washing detergent, cucumbers, bananas, lettuce, sweet corn or wine, as for the machine they are just different numbers, electrical impulses, bits.

Sitting on the bus, he considers sticking the barcode of a piece of cheese onto something else with the same weight, a rock maybe, or some wood. The machine would not mind. It would recognize it as cheese and charge the assigned price. He asks himself if this means that the machine could somehow transubstantiate stones into cheese. But what about the person who programmes it, he thinks, there must be someone who tells it what the numbers mean; or is this person also rather just following the algorithms set by the logic of the machine, like the friendly lady who took the cheese away?
Maybe the numbers are indeed the higher order of things, and since he and most other people are not proficient in reading binary numbers, everything is also still presented as the image (and text) of what it is (or rather supposed to be). For the computer it is only the numbers that count and so the shop is full of binary numbers in disguise for us human imbeciles. A pineapple is a pineapple is a pineapple, he thinks.

Did the cheese — for by now he has decided to doubt no longer that it was cheese after all — quietly try to resist this forceful transcendence into the realm of digital sameness? Did it perhaps even reverse it, instantiating itself out of bodiless information? He asks himself, if it would go too far to call the cheese emancipated. Once more, he wonders, what

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happened to this unprocessable, reluctant cheese after it was taken away. Was it outcast? Was it relabeled, made compliant at last? He wonders if there are really just zeros and ones in this bag wobbling on the ledge as the bus stops and goes through the evening traffic. Could he possibly be fed on zeroes and ones?

ENCOUNTER TWO.

He is already late for his appointment as his bicycle chain comes off. Ungracefully he turns his bicycle over and starts to fumble with the chain, trying to get it back on the gear. It takes uncountable attempts until he succeeds, by which time his hands are covered in grime.

Checking his phone for the way once more (just to be sure), he notices how his fingers leave greasy marks all over the glass. Later that day, even after having scrubbed his hands heavily several times, he can make out the traces of his contact with the stuff he usually likes to not have to care about. As he pokes his computer to make the words he is thinking appear on the screen, he suddenly chuckles. *Digital dirt, grubby fingers*, he thinks. The same digits he got dirty earlier are now writing this text. He makes them write other digits, digital digits, bits. But those digits probably could never get dirty, he supposes, continuing to poke the keyboard, hoping and expecting the machine to poke back at him.

ENCOUNTER THREE.

Writing this on a smartphone is so much harder than typing on a proper keyboard, he writes, tapping on the smooth, illuminated glass using only his right thumb. It is tedious and he constantly needs to delete nonsense. The glowing »soft machine« (Buxton) has no palpable delineations, there is nothing to hold on to. All the letters feel the same, slippery. He is reaching out for them according to the keyboard layout he holds in his mind. He tries to remember when he stopped having to circle his index finger over the keys to find the letter or symbol he desired. When did he internalize where he had to put his fingers to put the words out of his head and onto a screen? When did he become a typewriter (cf. Kittler G 214)? He cannot remember. Using a keyboard feels intuitive, he types. Sometimes, when he is bored, he closes his eyes and writes imaginary texts on imaginary keyboards. He knows where his fingers have to be to make `A`s and `L`s and `%`s appear, but he regularly forgets where his `][`s are hidden.

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But this shimmering reality is something else. It is as if he is reaching out for an apple on the table in front of him, constantly grabbing the pear, the orange, the oramgr, the applr, the peat next to it instead. Again and again. ItMs frustrating. It reakky is.

Still, slowly, and steadily, he moves on forward, downwards. Following his conditioned intuition, he lines up these letters, and the punctuation marks, and all the spaces between the words, tap by tap on those letters down there. His first thoughts have long disappeared somewhere up there. With a small gesture, a caressing of the glass, he could bring them back into sight. He knows that they are there. He knows that the crisp Helvetica his letters appear in under the glass in front of him, as well as everything else on the screen, is really just light, being blocked or allowed to pass through the pixels of the display. He has neither picked the font, nor decided its size, nor anything else about how his writing looks at this moment. In the end, none of this will matter anyway.

Later (right now, back then), he will take this text, this string of electrical impulses encoding these letters, out of the ›cloud‹ it has been stored in. His phone, saving this draft, will have sent it as electromagnetic waves across the room to his WiFi router, which will have picked up the signal. It will then send off the 25 165 bits (11905 0s, 13 260 1s) through copper wires and fibre optic cables. He cannot remember when exactly he okayed for all of this to happen automatically. There might have been a checkbox and a button that said »I AGREE«. *Whatever*, he thinks. He is unsure if it makes much of a difference if he knows where his zeros and ones actually reside, before he orders them back to appear here. He knows that the ›cloud‹ is most definitely some hard disk on a server, a big chunky block in a row of other chunky blocks, hidden and locked away in a data centre far away. But this does not make it any less abstract to him, really. Whenever he thinks of data centres, he thinks of Sol LeWitt's white cubes. But it could just as well be some fuzzy and foggy cloud after all. Or the moon. How would he know? Wherever they were, his zeros and ones will have waited there for him — most likely written as magnetic charges — to be sent back here. Infrastructure-wise, it is as if time and space do not matter for the reality of this text. But for some reason he stubbornly refuses to believe that.

Sitting in front of his computer, slightly hunched, he will copy this text with a few movements of his index finger over the trackpad and some clicks. He will move it into the document titled ›Thesis‹. And here it is.

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IMAGE REFERENCES

Images documenting my practice

1–12 installation shots
13–29 documentation of respective pieces

Images on small pages

ONE ..... image of CCTV video-footage of a ›fatberg‹. In: Rebecca Ratcliffe »10-tonne fatberg removed from west London sewer« *The Guardian,* 21 Apr 2015. Web. 1 Dec 2015.

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