

UBERMORGEN
userunfriendly

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Perpetrator: the human in the machine

Magda Tyżlik-Carver

*They are artists of torture,
They are artists of pain and fatigue,
They are artists of insults
and humiliation.
Where is the world to save us
from torture?
Where is the world to save us
from the fire and sadness?
Where is the world to save
the hunger strikers?*

— Adnan Latif¹
Poems from Guantánamo

Perpetrator. Gonzo research gone bad! is part of UBERMORGEN's *Superenhanced* artistic project. The project was initiated as research into what the artists recognised as the newspeak language practices of the government, military and other governmental agencies in the USA since the start of the war on terror. In this new-found language, which leaks into everyday culture, words like torture and kidnapping are replaced with bureaucratic dictionary creations such as Enhanced Interrogation or Extraordinary Rendition. The interrogation software UBERMORGEN developed for the *Superenhanced Generator* (a work within the *Superenhanced* project) functions as a tool to automatise and dehumanise techniques of interrogation: to make them more familiar in order to neuter their violence. The linguistic manipulations (where for example a form of torture through playing loud music in a controlled temperature room, with the prisoner often shackled to the concrete floor for hours on end, is hidden within the term 'sonic interrogation') make it conveniently impersonal and disaffecting, and, as such, perfect to repeat in daily news without the danger of offending the viewers and making the issue visible. The interrogation software, in the same way as newspeak terminology, is thus just another way to rationalise and, hence, normalise the 'psychotic events and practices' which take place 'unnoticed and slowly over time'².

The question is: how can we respond to this propaganda-cum-brain-washing where we end up not even confused but at ease with our growing insensitivity to injustice, hardship and terror? Lizvlx and Hans Bernhard propose that we do 'it' to ourselves and they give us tools to experience the two sides of the torture machine. The *Superenhanced* torture lab is equipped with the interrogation software fed by data entered by the users during the questioning process. The ultimate goal is to remove accountability from the human so

¹ Falkoff, *Poems from Guantánamo: the detainees speak*.

² UBERMORGEN, *How Real Is Reality. Familiarization as Part of Rock Culture*.

the acts committed during the interrogation are determined by the software; a Milgram experiment³ made easy. In the end, the software takes total control by increasing the ability to generate its own responses to its own questions, based on the original input from the user. The videos and photographs of adults and children (including the artists' own) in situations of torture, also part of *Superenhanced* series, illustrate the results of this generative human/computer interaction; torture as a form of participatory art. And if you want you can practice it at home: the photographs can function as instruction manuals for those wanting to experience how it feels to be hand-cuffed to the wall with a black hood over the head. In *Torture Classics*, another *Superenhanced* project, we can listen to familiar songs which are known to be used for sonic interrogation (a technique often applied in combination with other forms of torture, such as sleep deprivation and air deprivation – to name only a few of the legal techniques used in interrogation).

As in UBERMORGEN's previous projects, *Superenhanced* uses the technique of over-identification to amplify what in the system is considered the norm and how power is arranged. The point is to take the system to its extreme, to rationalise it to the point at which the totality of such a regime is made explicit. As Alexei Monroe explains in his book *Interrogation Machine* when writing about the Slovenian group Leibach and NSK:

If overidentification is to be effective, it has to (appear) total. Overidentification transcends and symbolically reactivates the terror of the social field (as structured by the regimes that shape it). The spectral menace of totality give the phenomenon sufficient 'credibility' to sow doubt and disquiet (as well as fascination).⁴

Over-identification as a method functions as an interrogation system, a kind of 'machine of expression that interrogates the onlooker as well as the sources for the works, placing on them the responsibility to process the contradictions generated.'⁵ UBERMORGEN use the newspeak language of propaganda – torture as 'enhanced interrogation', 'supermax' for super maximum security – and the title of the project, we realise, is itself a newspeak word: a compilation of the two into 'superenhanced'. Here the overidentification goes beyond the language and is activated through the *Superenhanced Generator* software and performed through the algorithm and in bodily actions that assist in 'acclimatising' and 'familiarising' ourselves with techniques of enhanced interrogation. We constantly move between the system that allows and facilitates torture, and the individual, the one who is tortured. In this experiment we identify with one or the other. In fact, what seems to be superenhanced is the number of ways in which one can experience those two sides of the torture machine in the kind of assisted rationalisation process.

Perpetrator. Gonzo research gone bad!, however, is a very different story. The project seems like a freak event in UBERMORGEN's research on torture. Unlike *Superenhanced Generator* where we are called into a frenzy of experiencing interrogation techniques through over-identification, the *Perpetrator* is something else altogether: an experiment that got out of control. In fact, *Perpetrator. Gonzo research gone bad!* is the only work in the series

3 Milgram, *Obedience to Authority* '... with the shocks becoming progressively more powerful and painful.' Controversial but now strongly vindicated by the scientific community, these experiments attempted to determine to what extent people will obey orders from authority figures regardless of consequences. *Obedience to Authority* is Milgram's fascinating and troubling chronicle of his classic study and a vivid and persuasive explanation of his conclusions.

4 Monroe, *Interrogation Machine*, p.79.

5 Ibid., p.10.

which takes as its subject not the methods and experiences of torture but concentrates on the one who facilitates it – the guard in the detention centre. And in this case we know him: Chris Arendt, an 'offspring of a white trash meth family' from rural Michigan, who at the age of 17 joined the United States Army National Guard and in 2004 was posted to Guantánamo Bay as a prison guard.

The unexpected turn in this project is the move from over-identification to identification: from exposing the torture machine by exaggerating an element of it to focusing on the human in the machine and building the story around Chris, the protagonist in the *Perpetrator*: 'one ridiculous piece of meat in that plank-o machine of orders'⁶ that is the guard in the detainee camp.

The life of Chris Arendt starts 17 years before the very moment he decided to join the Army. But it is this 'hasty contract signing'⁷ that defines the rest of it. If we consider the Internet as a living archive of human activities, the online records of Chris' life all relate to the fact that he was a guard in Camp Delta. Before that he was 'trailer-trash' with a displaced family, living with friends, who saw the military as the only way to move on and away from the life he was born to. As he says: "My family was poor, I was poor, and I wanted to go to school".⁸ His life driven by desire, ends up being defined by the realisation that he had been 'a concentration camp guard without ever having made many decisions.'⁹ This recognition perhaps supported the need to start making active decisions in his life after Guantánamo, and influence, or maybe even change, its dominant narrative. Chris has been an outspoken and active voice against torture and war since he left the army. In 2009, together with ex-detainee Moazzam Begg, he toured the UK and participated in a number of talks titled 'Two Sides – One Story: Guantánamo from both sides of the wire' which was organised to mark seven years of unlawful detention, abuse and torture.¹⁰ But he also started his own blog¹¹ where in striking and often dramatic prose, he records his memories of and life since Guantánamo. He participated in a *Combat Paper Project* which helps veterans of war to develop their own languages and ways to express their experiences through hand papermaking, using the uniform as the material from which paper is made. The process of changing life, forgetting, regaining respect is not an easy one and he admits that when playing banjo and singing: "You do not like what I've become. You much prefer the gentleman I was before the war."¹²

Indeed, the title of the project defines him as an offender, a perpetrator. It is like a verdict on the one hand, and on the other it recognises its inability to stay neutral (which, arguably, is what one expects from gonzo research). The work consists of twenty five photographs, a video and a short description of the project-cum-story that mixes fact and fiction. Photographs are that of Chris, taken either in the style of fashion shots in a dilapidated post-industrial location in Vienna, or hyper-pixelated images which make ambiguous the guard's gestures performed in front of the camera. The body in those pictures could be as well the body of a victim. Gesture of salute or raising hands up, praying in the mosque or down on his knees, marching or walking away. Is it a story of a

6 *Racism and War: The Dehumanization of the Enemy: Part 2 – Testimony of Chris Arendt.*

7 Arendt, *Sentimental Fibers.*

8 Arendt, *Warrior Writers.*

9 *Racism and War: The Dehumanization of the Enemy: Part 2 - Testimony of Chris Arendt.*

10 *Two Sides - One Story (part 1) Cageprisoners Tour – Cardiff; Racism and War: The Dehumanization of the Enemy: Part 2 – Testimony of Chris Arendt.*

11 Arendt, *The Paper Trail.*

12 Arendt, *Warrior Writers.*

soldier or a prisoner? A short animation created from the pixelated photographs depicting a silhouette moving to a synthetically generated version of *Scheherazade* by Rimsky-Korsakov acts as a reminder of some abstract rationality which controls the movements of the figure in the film. The body of the soldier and the body of the enemy combatant are equally controlled by 'orders that comes down from God-knows-where. It just keeps coming down and it just keeps going through.'¹³

So what to make of UBERMORGEN's change of tactics? Clearly living for two months in one flat with a dangerous man who himself wonders if the inability to feel anything makes him a sociopath¹⁴, could be considered an extreme approach to art making. This is how they describe this experience:

Imagine there's a murderer in your house. And it is dark outside, and the electricity is out. Imagine your nervous system spiking, readying you as you feel your way along the walls, the sensitivity of your hearing, the tautness in your muscles, the alertness shooting around inside your skull. And then imagine feeling like that all the time.¹⁵

It obviously was not an easy situation to endure for many weeks, even in the comfort of one's home. Why then this focus on the guard, and why such extreme measures of researching the subject? Why personalise it by pointing a finger at the man and saying 'perpetrator'? Does this take away the responsibility from the system and place it directly on the individual? In the same way that President George W. Bush stressed how the photos of torture and humiliation of detainees in Abu Ghraib represent only isolated crimes by some individuals and had no connection to the way in which these prisons were governed, or the systems which facilitate them? Is *Perpetrator* an act of self-sabotage by artists who in effect completely undermine their own efforts in the rest of the *Superenhanced* project?

There is, however, a subtle motive which can be missed if one concentrates on moral judgements that could be easily manifested as black and white statements. And we are reminded to be cautious and forget about 'our own motivation and moral high-ground', because, as the artists say, '*Perpetrator* has to find his own way, only then he can serve us as a case study and model for future reference.'¹⁶ *Perpetrator* is a story about a man, a particular man whose name is Chris Arendt, who was a guard in Guantánamo Bay detainee centre in 2004. His story is built of many narratives that go beyond UBERMORGEN's project. Some of these are contained in and communicated through UBERMORGEN's photographs and film, some are of Chris' own creation such as his writings on his blog, some are recordings of his public talks, and some finally are a mix of fact and fiction. For example, Chris Arendt in *Perpetrator* kills himself (fiction) shortly after the suicide of Adnan Latif, a detainee in Guantánamo Bay prison (fact). *Perpetrator*, and the way in which the figure of Chris Arendt is the subject in it, invites a further search for answers. It is no longer enough to accept the artists' verdict, regardless if we agree with it or not. We are invited to perform our own gonzo research and, at the same time, we are challenged to give our own verdict. It is a twisted exercise in subjection, and a reminder that totalizing forms of power go hand in hand with forms of individualization.¹⁷

¹³ *Racism and War: The Dehumanization of the Enemy: Part 2 - Testimony of Chris Arendt*.

¹⁴ Arendt, *Sentimental Fibers*.

¹⁵ UBERMORGEN, *Perpetrator. Gonzo Research Gone Bad*.

¹⁶ Ibid.

¹⁷ Foucault, *The Essential Foucault*, pp.126–144.

Perhaps, as livvix suggested in a conversation about *Perpetrator*, all questions about torture were answered in Nuremberg Trials of 1945–1946. Nevertheless it was necessary for the Washington-based independent think tank Constitution Project to undertake an autonomous, bipartisan research into the question if the USA had been involved in the practice of torture since the war on terror was launched, and if the highest officials bear responsibility for it.¹⁸ If there was ever any doubt, the report makes it clear that:

U.S. forces, in many instances, used interrogation techniques on detainees that constitute torture. American personnel conducted an even larger number of interrogations that involved "cruel, inhuman, or degrading" treatment. Both categories of actions violate U.S. laws and international treaties. Such conduct was directly counter to values of the Constitution and our nation.¹⁹

The question provoked by *Perpetrator*, however, concerns the individual and his or her participation in inhuman treatment of detainees. UBERMORGEN's decision to focus on Chris/guard is a decision to humanise the human, to recognise those moments of contingency that are dependent on the human participation and his/her decision to act.

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¹⁸ *The Report of The Constitution Project's Task Force on Detainee Treatment*

¹⁹ *The Report of The Constitution Project's Task Force on Detainee Treatment*, p.9.

Do You Think That's Funny?

A Conversation between Edward Snowden and UBERMORGEN

We met Edward Snowden at Vienna's International Airport in Vienna on July 2nd, 2013 shortly after Bolivia's presidential aeroplane, having been denied the right to cross their respective airspaces by France, Spain, Italy and Portugal, was forced to land in Schwechat. Snowden had been on board as a guest of Evo Morales. Shortly after the arrival of the plane, a close friend of ours, who works at the airport, tipped us off. It took us less than thirty minutes to grab our stuff and arrive by cab. Our friend guided us through airport security into a rather filthy office area in the former main terminal.

We found Edward Snowden in a small, stuffy, neon-lit room, where he seemed to have been deposited like a questionable parcel that nobody wanted to touch or knew what to do with. After our initial hello and how are yous, Edward described the rather strained behaviour of the Austrian Authorities. He said they seemed to go out of their way in order not to have to talk to him: they wanted to keep their record clean and stay 'neutral'.

Historically, having served as an intelligence hub between East and West, Austria has a record of facilitating secret service meetings that few other countries can match. We were quite astonished that there were no OGA's in the room with Mr. Snowden, so we grabbed the opportunity and started to talk with him. He immediately lighted up and actually seemed happy to see a couple of friendly faces. We spoke quietly but fast since we had no idea how much talking-time we had left.

UBERMORGEN: Edward, welcome to the Internet! It is great for us to meet you, even if the circumstances are rather weird. Actually, only 45 minutes ago we were discussing your Hong Kong video-interview with Greenwald and Poitras as we were preparing food for our two little girls. The food is probably still hot and we are sitting here with you, the most wanted person on earth. We are a bit overwhelmed, I must say... But, anyway, how do you feel being parked in a shitty room here, coming straight from the lap of luxury and security in the presidential plane? Has anybody talked to you since your arrival? Do you feel all this is real or is it like a bad dream?

Edward Snowden: I am not really scared but I don't feel ok. Nobody talked to me, you are actually the first people to direct a full sentence towards me since we touched down. I had a really interesting and revealing conversation with President Morales on the way here, he is a brilliant entertainer, a very intelligent man and he helped me contextualize certain political aspects of the ongoing situation so that has been very helpful. But I am angry about having to land here in Vienna. I hope we will soon be in the air again on our way to Latin America.

UM: We hope so too! It would be only logical for us, actually for anybody, to press you for as much info as possible, but since we are no journalists and are more interested in other layers of reality we will leave this to others... You seem to have a very good working relationship with Poitras and Greenwald anyway and I need hardly tell you that your story

is headline news. So we are sure there is no need for us to get the word out... We are interested in a conversation rather than an interview, we are curious about the personal aspects of this story and we would love to talk to you about the bigger picture: global paranoia, surveillance happening on an industrial level, the technological infrastructure that is way beyond everything even we can imagine and that you are an expert on. And we are also very curious about the difference between what we imagine is going on and what is actually going on as far as you are concerned. And we wanna know about your ways and means of communication, it would be nice to tap into your knowledge for a while... In exchange we promise to use it in an interesting way.

ES: (reply erased at the request of ES)

UM: You are obviously a nerd and *The Revenge of the Nerds* takes on an altogether new meaning with you. Usually nerds never out themselves individually and in public they tend to move in herds. If that is not an option, people like Jakob Appelbaum appear as a 'spokesperson'. We don't know these people and we don't trust them. Does Appelbaum in fact work for an Agency? Another entity we are fascinated with is 'Anonymous', a very powerful idea and the label for some of the most hilarious stunts in recent internet-history.

ES: (reply erased at the request of ES)

UM: Anyway, the nerds in herds are very different from you, you have chosen the most extreme way of personal resistance and you have exposed yourself in a way that potentially endangers your life. We keep working with nerds on specific projects using coded networks, we did a lot of this in the past, especially in the 1990s, but since then we've become increasingly uncomfortable working with real geeks. Most nerds don't understand the first thing about art and they don't care and, conversely, we are not nerdy enough by far. So these cultural differences have wrecked many ideas and many of our projects – since we don't have the resources to program larger and more complex systems – and personal relations have deteriorated... and since then, sorry to say that, but I simply hate working with nerds...

ES: We don't HAVE to work together, you know. And I'm not sure that, coming from Europe as you do, you would understand the differences between nerds and geeks in American culture, but that isn't important here. Sure, you can call me a nerd. I have never understood how artists tick or how the art system operates. I have never been remotely interested. My attention was targeted towards technology and the military, so my approach was always analytical. This, plus my patriotism, was it for me. Maybe my development is a bit of a paradox since I started off always doing what I was told. Actually, I even wanted people and later organisations to tell me what to do. It just felt normal, and that lasted for quite a long time. But the problem was that there came the time when I started seeing and reading things that I shouldn't have seen, I definitely saw too much and that became a problem for me.

UM: And for others now, right... What do you think are the psychological prerequisites that enable an individual to embrace their personal responsibility?

ES: The moment you know too much you cannot un-know it, so this leads you to this difficult situation where you have to decide: can I live with the consequences of not doing anything, or can I live with the consequences of my actions if I do something? Since both

are unknowns – and the buck doesn't stop there, as that Rumsfeld freak reminded us: "There are known unknowns. That is to say, there are things that we know that we don't know. But there are also unknown unknowns. There are things we don't know we don't know" – and your fate is like a chip in a poker game where anything could happen; it could be won or lost, dropped on the floor, stolen, eaten or destroyed. So in the end I had to open Schrodinger's box and go down one path. But if I think about it now, I envy you artists in a way. Your job is more clearly defined and it includes options that people like me don't have, because your duty is to publish without restrictions, to inform, to uncover and you have to be subversive, whether you like it or not.

UM: Not really, there are so many artists who don't care a hoot about what's happening in the world. Only yesterday we had a conversation with Suzanne Treister and she said that abstract minimalist painters are probably very conservative people. We agree. How can they not be conservative? Actually for us this form of painting even requires a certain amount of underlying fascist ideology. Anyway, there's another issue where I think we might have some common ground. Can you tell us what your experience with US officials and with the intelligence community in general has been like? We heard that there are more than 250,000 people with top security clearance within the DHS – the Department of Homeland Security. We think you might just as well print out all the classified stuff and hand it out to people on Times Square or upload it on Pirate Bay. It's funny that this is what you do; you distribute top secret documents to journalists and to the public. We think you are morally – or even legally – bound to do so if the documents contain proof of crimes against humanity. Recently we ran into a similar issue during the research on our project *Superenhanced* that deals with Newspeak and torture. Soldiers are ordered to torture people, torture is illegal and if a soldier is ordered to do something illegal it is his duty to report it. If he doesn't, he commits a criminal offence. But this is a very difficult decision because in the end it means you lose everything to save your conscience.

ES: I sometimes ask myself how many more potential whistleblowers this organisational cluster is home to.

UM: That's exactly what we wanna know. Our experience is that US officials and probably large parts of the intelligence community are rather stupid on an organisational level. The system administrators have risen to become the most powerful people in the world, they're in charge of everything, of entities such as the military, governments and corporations. Even more importantly they can shut down all the crucial infrastructure we rely on such as energy, finance, water, logistics, food, etc. They have access to deep layers within organisations and to secret information. A nerd revolution – an RL replay of the 1984 *Revenge of the Nerds*, as it were – is just around the corner, that is for sure. And for me it was only logical that after the former hacker Julian Assange, now a system administrator, became the next leak-superstar, you should apply a totally different philosophy towards leaking and exhibit a fundamentally different understanding of what you do and how you do it.

ES: I agree, system administrators are the unrecognized geeky underworld 'gods' of all organisations, corporations and governments alike. If you look at the current status of the world a nerd revolution certainly has a lot going for it but there are also very powerful arguments against it. Look at the organisational structure, there is no union or other cohesion. Sure there are the Hacklabs and there is Anonymous, but both only account for a tiny percentage of the overall number of sysadmins active worldwide. And then a lot

of them passively or actively support the current socio-political and economic systems. But in case they do get organized and create a sysadmin army, it would just require one embedded code-soldier per organisation and the world as we know it could swiftly and forcibly be taken off the grid. I mean, look at me. One person can do so much damage. But don't get me wrong, it has never been my intention to harm people or organisations and contrary to what is being said, it's never been my intention to harm my home country, not at all. I admire the people and for this reason I cannot accept a government that lies to the people and snoops on American citizens in the absence of the legal preconditions. This puts everything at risk, even the stability of the government itself.

UM: Sometimes we wonder how Hollywood always succeeds in sussing out what the NSA is doing when politicians only seem to have a very limited knowledge of what's going on, and even Obama obviously has to learn certain things via the media before he can have them investigated. Or is this a naive view? There is always the possibility of a conspiracy, but I tend to look at the really large systems and see an endless amount of vectors pulling in all different directions and interacting with each other, so in the end it amounts to chaos. Sure, highly opportunistic organisations might be able to suck profit from such a mess, but there is no such thing as a central command structure.

ES: Ahem... I have been doing quite a lot of thinking about these issues, and for me it all comes down to values and consequential decisions in the end. And this brought me here today...

UM: I remember how it feels being the centre of a mass media hurricane at the receiving end of a transnational legal battle. Our performance, in which we claimed to buy and sell votes during the Bush vs. Gore 2000 election, laid us open to the charge of potentially endangering the integrity of the U.S. elections and created, in the eyes of the powers that be, a dangerous situation that could have resulted in a government without a head, in military coups and suchlike. We were scared of American agents active in Bulgaria, Austria, Switzerland, Germany and the UK, the places where we were working from at the time. Actually, this was the first time we made contact with the NSA, FBI and CIA. We did have a first brush with the Secret Service in the 1990s, but 2000 really meant playing in the top league. So I can imagine the pressure you must feel and I must say, I admire you for what you do and how you do it, you seem to be very much in control although I know you are not. But your vibes are more the vibes that radiate from a Zen master than from an insecure computer geek – and believe me I know my fair share of such geeks and their vibes. Even though Julian Assange is a true rock star, you are a weird new phenomenon, a star in your own right, yes, but unlike most sysadmins who are lo-key underground forces, you are the first visible global nerd star after Bill Gates! We have included you in our *Icons* series, next to people such as Vladimir Putin, Angelina Jolie and Sergey Bubka.

ES: I hate being idolised or talking about my image. We should be talking about more important issues here.

UM: But you are a star, the moment you revealed yourself to the public you became an instant icon of Digital Resistance, Actionism; you're bound to become one of the most influential people of the decade. But since you are such a nerd, I guess you are pretty good at compartmentalising. How do you do this? Do you take meds or do you do Zen meditation? How do deal with this pressure? Your colleague Bradley – now Chelsea – Manning, went through a very rough time and has now decided to live as a woman. This

seems to be Manning's way of dealing with her very own history and especially with her future in prison. This is one way of transforming and we're all curious to see how your image, your body and your intellect will evolve over the next years.

We are suddenly made to feel uncomfortable by English speaking people entering the room. The group includes Austrian officials, uniformed Bundespolizei (Austrian Federal Police), the Bolivian ambassador, a Russian-speaking lady and what seems to be a team-leader of the Cobra taskforce. When we indicate that we would like to stay we are bluntly threatened with arrest. We try to take a couple of photos but our mobiles are immediately taken away (we received them six weeks later, minus the photos).

ES: I think I need to go. Good-bye!

UM: Thanks, Edward. Good luck!

That was the last we saw of Edward Snowden. Austrian officials unofficially told us that he was about to be covertly sent back to Moscow-Sheremetyevo International Airport in a unidentified private plane. Until today both the Austrian authorities and Bolivian diplomats have officially denied the presence of Edward Snowden in Vienna, presumably in order not to endanger their good relationship with the U.S.

During the visit we discussed certain issues that had to be deleted from this publication. We have established our back-channel with Edward Snowden since then and we communicate from time to time. We are proud to say that we're in receipt of an encrypted data package, some unencrypted samples and several video messages delivered to us by different couriers. His communication methods are awesome and we would like to publish them for people to use them, but at Edward's request we've agreed not to do so for the time being.

The encrypted data package and the sample files are part of the installation *Do You Think That's Funny? - The Snowden Files*. This work is one of the results of our meeting with Snowden and we want to thank Edward for his trust and cooperation under such extreme circumstances.

Consensual Hallucination and Collective Delusion

A conversation between UBERMORGEN

and Dr. Tobias Noebauer

Hans Bernhard: Hallo, Tobias, we have this publication in the pipeline about our exhibition and what I want to talk to you about is grid paintings, surveillance, black holes, paranoia, infinity, psychoses, cyborgs, performance art, research at the border of the thinkable and knowable, and parallel universes. I would like to talk to you in your capacity as a physicist. What fascinates me is the possibility of picking up again the thread of a conversation with you, a scientist who has been described as Austria's one in a century scientific talent, that we started in Vienna about pixels as the smallest visual unit and about physicists working for Wall Street.

Dr. Tobias Noebauer: Uah!! You've given me quite a shock! I was totally engrossed watching *Illuminati* on tv, and then this! I know of no antimatter that is supposed to have escaped from CERN. What I do know is that it was presumably not my fault. But I will admit this: while under the influence of drugs I talked to this crazy guy about micro black-holes and he filed a complaint against CERN at the European Court of Human Rights. That was all. And: I'm keen on exploding the notion that I am a one in a century scientific talent.

I must admit that my interest in art is very great, there is no way I can alter that. I'm also acutely aware of your work from many festivals and exhibitions. I have clear memories of *Vote-Auction*, *GWEI*, *Psychos*, *Asylabwehramt*, *Sound of eBay*, and *WOPPOW*. I get to talk to artists quite often and I've just come to the end of a stint as 'Artist in Residence', which was a first for me. I did expose an artist to a slight overdose of radiation at a reactor once – but then he needed it, he's now given up smoking and I've learnt my lesson.

HB: Could you possibly expose me, too, to a 'slight overdose of radiation'? I think I could do with a bit myself. We did get contaminated a bit by radiation on our last visit to the reactor in Fukushima, but obviously not nearly enough for me to get a grip on my mental problems (WHO ICD-10, F 30.1¹) or my binge eating.

On the intimate relationship between art and science

HB: On the subject of projects: how do you work? Do you see any analogies between processes and issues in your field and in art? And what I mean by art is art that is understood as research, that is committed to experiment, not art done by purely formal practitioners, even though there may well be overlaps here too. In theoretical physics there are abstract constructs that might very well pass for art – or am I mistaken? Is my thinking overly influenced by such TV series as the *Big Bang Theory* and other ideas of popular science? My father demonstrated to me that pure scientific research and art often have a lot in common, and that there has been a great deal of cross-pollination between the two fields in the course of history. What they have in common surely is the problems they

¹ WHO ICD: World Health Organisation International Classification of Diseases

both grapple with – imagining the unimaginable, thinking the unthinkable and, above all, remaining consistently true to your own, self-defined, and often extremely controversial, path, without paying heed to what it may cost to do so, to moral or ethical reservations or health considerations. In my eyes, this is the only way to arrive at insight both in science and in art.

TN: After staring at the distinction between science and art for quite a long time I'm finding it very difficult to name any substantial differences. Is it not the case that the distinctions within both fields are more marked than between them (applied – pure, market – academia, consensus oriented – critical, collaboration – doing it alone, fashion – long-term horizon, experiment – theory)? What is different are evaluation systems, training, degrees, careers, etc. Science typically takes the form of work done in organisations and collaboratively, which can hardly be said of art. But both must produce results that can be shown to 'work', be it by experimental testing, by a convincing and internally consistent story, by being nodded through by the community, etc. Is it possible for a physicist to come up with a theory starting from zero? No, he's got to latch on to previous knowledge, his theses must be capable of being validated by experiment, the theory must be sound. Is it possible for an artist to create a work starting from nothing? Equally impossible. So the differences are a matter of organisation, of how precisely evaluation takes place. Everyday work processes may be very similar (zealous hammering out of details or immersion in thought; writing applications; engaging in discussions; fixating). The two fields contribute to each other's evolution, there's no question about that – and for me this is by far the most exciting aspect. In purely abstract terms, the two fields are equivalent on the whole; in concrete terms, seen from the point of view of a human being with a finite lifespan, switching between the two is extremely difficult because of the specific expertises needed for them as regards details and experience. Blaaaah. Another major difference in my experience is this: in art it's OK for people to talk/perform without initially claiming that they're right. Whoever raises their voice in physics does so with the intention of proving that they are right.

On pixels, perception and elementary particles

HB: I see... What interests me from a purely opportunistic point of view to begin with is your scientific, aesthetic, content-focused take on our grid paintings. I know it's an awful name but then there are worse ones, pixel painting is even more jaded. The issue of grids, matrices and other aspects of pixels is one that I've been wanting to discuss with you for a long time. We settled down to seriously making these grid paintings as early as 1996. What we do is we start from thumb nails or from pictures reduced to thumb size, usually roughly 50 pixels wide, process each individual pixel and enlarge the picture to a format suitable for looking at and printing. This results in an information surface that is pared down to a minimum and represents a commentary of sorts on the current digital media. Interestingly enough, we've reached a stage where we see things in real life but have to have them verified by digital media channels to be able to accept them as real. A friend of ours had an unimpeded view of the collapse of the WTC towers but for him to believe what he had seen he had to watch the replay on TV. At that time we produced our series of live '9/11' grid paintings. What's your take on the pixel or rather on the information reality of the pixel? Is there an equivalent to the pixel in physics? Is there such a thing as this 'element' and if so, how would you describe the pixel of physics in comparison to our visual and informational exploitation of pixels?

TN: Pixels for me are the results of the zooming of perception in both directions. To begin with, they appear as "coarse graining", as the result of a measurement whose resolution is subpar, i.e. below that of the external reality. To that extent they're the result of a zooming out from the object, blurring the details of the picture that are smaller than the pixels and/or the spatial frequencies that are higher than the dpi. Conversely, quantum mechanics owes its existence to the discovery that sufficient zooming in to the object results in pixels becoming visible, which in this case are quanta, atoms. The surface of a piece of metal looks smooth enough to the naked eye but in fact it consists, as has become clear from a great number of experiments, of a grid of relatively hard dots – the atoms – that are surrounded by a lot of empty space. If you look even closer, you see that the atoms themselves have properties that only occur in discrete expressions: energy levels, nuclear spin, electron spin, the elementary particles themselves, which are described as excitation quanta of fields of a certain symmetry.

HB: Excuse me for interrupting. What precisely is the difference between pixels and atoms? I keep on thinking of *Blade Runner* and *CSI*, where there is this zoom from the surface of a normal image that has some illegible detail to its depth and suddenly there are these crisp outlines, as if a miracle had happened. This seems to be a fundamental misunderstanding of this technology – resolution does not gain from zooming into an image – but then it's precisely what we're offering as a service in the grid paintings: we zoom on to the pixels and back again and show what it's like inside, very colourful and very illegible and what you get is what you see, neither more nor less. And this is an undisputed fact about our digital media world: the images of reality that are presented to us are marked by a very low resolution, especially in the visual media culture. So what I'm getting at is this: is this not similar to a piece of metal, where you have this atomic resolution and if I zoom into the metal, I see more and more details, the pixels as it were. The only thing is they don't necessarily appear any larger because it takes much longer for them to become visible in the first place.

TN: A pixel is the smallest possible defined spatial unit, for instance on a camera sensor, that can tell us how many photons have been absorbed by it. So, in this respect at least, the atom is the smallest possible pixel. To absorb one photon you need at least one atom. Anything less is impossible. Seen the other way round, an atom is also the smallest possible source of light.

OK, the analogy I've just drawn between pixels and atoms is deficient in one respect: a pixel is the smallest spatial unit of the recording device that can be isolated from its context and read. If you look at the emergent image, you get the impression that space is composed of these tiny rectangles. This is of course obviously wrong. You could choose a higher resolution – and a higher degree of enlargement – and you would immediately become aware that many additional details are concealed in each individual pixel. However, if you go on refining this process until the smallest unit of the recording device is coextensive with an elementary particle, one that can no longer be subdivided, e.g. an electron or a photon, you will discover that the world is indeed ultimately pixelated in a certain sense: there are these smallest units, the fundamental particles, which one can see, and at the same time there are these smallest units that are available for the storing of recorded information. If these two units are coextensive – and larger than all disturbing influences – you are doing quantum physics.

There is of course a crucial complication that is still in store and that you've got to reckon with. As human beings, we are used to being able to observe a wide range of phenomena without exerting any influence on them. As we watch a bird in flight, some of the quadrillions of photons scattered by the bird hit our retina, causing a molecule to tilt and triggering an escalating molecular cascade that in the end leads to an electrical nerve impulse. The bird was not disturbed by the photons. However, if you wanted to observe the bird using footballs instead of photons – if you tried to get the bird to scatter footballs that you would subsequently detect – the bird would experience being measured as a massive intervention. Yet the problem of quantum mechanics is precisely this: there are no smaller particles available for the observation of an atom than individual photons and these are very similar in “size” – in terms of energy and momentum – to the atom itself. Each act of observation therefore represents a massive intrusion. Yet the worst is still to come: in quantum physics you've got to take leave of the idea of a discernible external reality that has existed prior to the measuring process and will go on existing after it and all that we've been lacking so far is the capability of measuring that autonomous reality sufficiently accurately. These assumptions, even though they have the weight of habit on their side, are just that – assumptions, and ill-founded ones at that. In fact, it is the interaction that creates the properties, measurement results, reality, on the basis of the possibilities that the two participants in a measuring process have of interacting with each other.

In quantum mechanics as generally practised it is not space/time that is pixelated as in a GIF, it is the properties that are found anywhere in space: the discrete levels of energy in atoms, the quanta of electrical charge, the spin quanta, the light quanta (photons) and other properties that were previously conceived of as continuous rather than as pixelated. This corresponds to the colour values that are accorded to each pixel in a GIF: these are likewise discrete, e.g. 256 values per colour channel (8-bit colour resolution).

Whether the appearance of a pixel or a quantised measured variable results from particularly bad or particularly good resolution is at first unclear. Our visual cortex interpolates the missing bits between pixels on our retina (the photoreceptors) in a manner that leaves us unaware of the pixelated nature of our visual sense. Nor can we perceive the fact that light always hits the retina in discrete portions (photons) even though the photoreceptors are in themselves sensitive enough for this task. The reason why we do not perceive individual photons on their own is that it takes roughly eight simultaneous photonic events in adjacent photoreceptors to persuade the nervous system that what is going on is different from mere thermal noise. This is similar to pixels in a camera equipped with a CCD² image sensor that are activated merely by the room temperature, without an outside photon being involved.

In fact many emergent phenomena depend on the choice of resolution and the field of vision. Insufficient resolution causes aliasing – the spatial frequencies occurring in the motif are not read sensitively enough; excessive resolution produces shot noise if working in the limit of few photons, i.e. the realm of quantum optics. If the available light is spread over so many pixels that only a few incoming photons are available per pixel, the average number of photons will be subject to great variation – because it is more likely that there will be 10 incoming photons instead of 7 than 1,000 instead of 700.

2 CCD: Charge-Coupled Device. An image sensor is a device that converts an optical image into an electronic signal.

So what do you do to reality if you pixelate it? I would say: you create it. Reality is the possibility that can be observed repeatedly in the same way, without exhibiting changes due to the back-action of the measurement interaction. Reality is that possibility that can repeatedly imprint information about itself onto other carriers of information; reality is the possibility that can be cloned. Quantisation in physics seems to be a precondition for stability. If the energy levels of atoms were not quantised, atoms would be bleeding energy all the time and electrons would be plunging into the nucleus.

HB: The grid paintings that we are doing must also be seen in terms of their content, whether they are pictures of 9/11 or Abu Ghraib, dead children in the Gaza Strip, mental patients in Singapore or the iconised Vladimir Putin from the *Icons* series. What are the realities in these cases that can be cloned and imprinted on other information carriers? If you were to recall these pictures before your mind's eye, you would see different things than I would. I try to clone my reality on to other information carriers. This doesn't work, so I take pictures that are low in visual information content to begin with. I go on reducing this content until I reach the essence of the visual, the visual atom. There is a limit to what I'm doing here, which is imposed by the technology that is available to me. I would be most interested in finding a method in your lab to break these pictures down to their atomic structure. Right now I'm working with visible and invisible visual glitches.

TN: May I briefly interrupt you. Reality is what reaches dynamic stability in the encounter of an entity (with a set of possibilities for the next timestep) with a specific observation set-up (again with a specific set of possibilities for the next timestep); the backlash caused by the observation influences the entity in such a way that the next repetition of the observation yields the same result once more. What I mean by 'result' is the triggering of a signal cascade, which makes the minute impact of the entity on the observation set-up more robust and transfers it to more substantive carriers. The stage is reached somewhere along that road when the measurement (i.e. the reality that has emerged) is so stable that it may last for centuries and withstand massive force.

The aesthetic of a medium or a style (e.g. pixel painting) may be understood as a reference to a kind of reality that is preferentially produced by these observations or recording devices.

Surveillance, quantum computing and parallel universes

HB: I was in the audience during your viva voce at Vienna's University of Technology not long ago and found myself unable, during those 45 minutes, to understand a single argument, a single idea. Luckily I had read a popular science newspaper article about the kind of research you're involved in so I was able to relax and to speculate who the professors and other colleagues of yours might be thinking I was. It was obvious that everyone in the room knew everyone else and that I stuck out like a sore thumb. I took note of the body language of the 40 or so guys in the room and tried to work out how I would have to behave to pass for an MIT researcher. I've now wandered from what we were discussing...

TN: Still, that's great! What was my body language like? I'm still unable at lectures to divine how things are going for the audience and I guess that makes me a pretty inept performer. My entire concentration is still absorbed by my attempts to give shape and

clarity to what I want to say and I consider myself rather stupid on the delivery score. How do you react to having to perform live in public? Are you still aware of the precise reactions of the audience?

HB: I gave an 'ArtistTalk' here in Aarhus only yesterday. I perceive the audience through a pane of glass, as it were. I don't want to have that much to do with them and this is why I cut out whenever possible the Q&A bit at the end. My trick, if you can call it that, is to focus on individual people who I look at directly, who I fixate with my eyes. At the same time I seek to maintain a fleeting contact with as many people in the room as possible and to look them briefly in the eyes. I believe that helps people to get more involved. The audience's reactions are a clue for me to their mood. I've come to realise more and more that I don't really care what expectations I'm supposed to meet and how I'm getting across. All I really care for is the quality of the content. My 'delivery' obviously varies from occasion to occasion. I like to entertain the audience but in the end it's the substance that counts.

TN: At the beginning you mentioned 'surveillance, paranoia, performance art and parallel universes'. I suddenly remembered one of Julian Assange's statements when he said how wonderful it was of Nature to offer possibilities of encryption (cf. J Assange, J Appelbaum, A Müller-Maguhn, J Zimmermann: *Cypherpunks*. London: OR Books, 2012). In this context one might also talk about quantum cryptography and the quantum computer: the latter is the first recording technology to guarantee the impossibility to trace a certain type of information. But does physics in the box justify greater trust than mathematics? Does the NSA have access to a better physics? Parallel universes are one of the answers to the great question about the decoherence of quantum superpositions (i.e. that correlated space of possibilities in which the whole is still allowed to be more than the sum of its parts). I however would prefer to use concepts such as dissipation and the need for leaks in talking about the possibility of an event and the emergence of reality (and, therefore, of something clonable). Information is something physical and leaks mark the arrow of time. Down with reversibility! Observation is tantamount to setting harm for possibilities. Reality is a confession that has been forcibly extracted!

HB: We've talked repeatedly about 'consensual hallucination', a joint hallucination we're all taking part in, something we have agreed on so that we may be able to interact, think and communicate. Does this have anything to do with what you've just said?

TN: All possibilities are capable of reality that manage to keep on delivering the same observation result about themselves so that many observers agree on what they perceive. In quantum physics reality takes shape in the course of the observation process, which is never purely passive. Each exchange of information presupposes a physical interplay, each measurement has a back-action. In order to get quite specific, concrete answers, you've got to ask concrete questions, i.e. create a physical set-up that guarantees both that uninteresting information is weeded out and that interesting information takes centre stage. A measuring device selectively transforms small things into big ones. You gain clear contours in one aspect at the cost of losing them in a complementary aspect. I personally believe that this effect can be generalised to cover all kinds of symbolic (language tied) processes: whoever wants to ensure a certain behaviour, an answer to a specific question, a particular future, must necessarily let go of certain orthogonal aspects. Digital machines (and digital strategies, ideologies...) are still committed to classical physics: there are such things as determinism, reality, clear-cut categories.

Everything is observable without the necessity of allowing for back-action, everything is unambiguous, everything is predictable (overseeable, analysable, intelligible). Computers are thermodynamic machines, there is nothing about them that cannot be replicated using cogwheels, belt drives, stones, etc. Mechanics and electronics are simply two different realisations of the same force (electromagnetism). In some works of science-fiction (e.g. *The Diamond Age* by N. Stephenson), nano-age computers are described as nanomechanical clockworks, with molecules as cogwheels, rods and switches that interact. This is by no means absurd. Many processes in molecular biology are 'mechanical': a molecule tilts, pushes a lever, another folds, etc.

The information age is still clinging to spurious certainties: reality is something that simply exists and we're in a position to sample it; one voxel³ of the world is never linked to more than its immediate neighbours. In the quantum world this is no longer the case. It can no longer be ignored that information is always physical, it is always tied to a physical carrier and, conversely, each physical interaction is an exchange of information. Classic computers waste information to generate stability and irreversibility; this is also the basis for classic encryption. Quantum computers do none of these things. All operations are reversible save the last one, the measuring process that is required to generate the reality of a result.

Edward Snowden, Schrodinger's Cat and Wittgenstein's Duck/Rabbit

HB: What is of particular interest for me with regard to the installation *Do You Think That's Funny? – The Snowden Files* is your claim that information is physical. We are going to provide a physical manifestation of effective information and of its representation – different sources, Edward Snowden among them, have given us access to classified and as yet unpublicised documents of the U.S. administration. We're going to use four networked BeagleBones⁴ for the purpose. The idea that I formulated differently for the exhibition *Money After Money*, curated by Yukiko Shikata in the GYRE Tokyo, is that money or, say, documents are no longer stored in conventional physical storage mediums but in the cable, oscillating between the processors and the network interface cards. What matters is the protocol. There is no such thing any more as money or documents, what is left is the exchange of possibilities for other possibilities, a kind of fluid and ephemeral state, more closely akin to electrical tension than to the extremely conventional data carriers you mentioned earlier, such as SSD⁵ drives, stone tablets or paper. The question of usability doesn't arise at all as we want to shield the documents from being accessed by the authorities. We store copies of the documents that are on display but cannot be accessed in a secret, secure location. Think paper sculptures, bank safes or platforms such as The Pirate Bay⁶.

TN: There is no such thing as information without a physical carrier. As classic computers are dissipative machines (they create irreversibility and unambiguity via pre-defined leaks and step up the entropy of the overall system) they need energy to function. OK, digital info is stored on lighter, smaller storage mediums than information used to be when it was printed on paper (and the cable is lighter in weight than the road) but does

³ The 3-D equivalent of a pixel.

⁴ A cheap, credit card-sized Linux computer.

⁵ SSD: Solid State Drive

⁶ A website that provides torrent files and magnet links to facilitate peer-to-peer file sharing.

that mean that there has been a real shift in the necessary resources? Anyone can write a book or operate a blog, no doubt, but hardly anyone can accumulate a complete library or operate a search engine. Anyone can write an e-mail but hardly anyone can eavesdrop on all e-mails written all over the world. Thoughts are free but bodies can be subjected to torture. It is precisely Edward Snowden's leaks that are proving frustrating to the friends of the digital by demonstrating how little has changed. What is there about e-mails that makes them more difficult to access than, say, letters? What I cannot share in the digital domain is the experience of the ephemeral: if it's unambiguous, you can nail it down. If you can write it down, you can eavesdrop on it (and leak it!). If it needs a lead, you can interrupt it. If it needs electricity, you can switch it off. If it were blurred, it would not be macro real. If it were ephemeral, then there is no way that millions of people learn about it at the same time. We may regret it but the power remains in the hands of those who control distribution, who have the necessary financial and productive clout, who own land and armaments. The world was complex enough already in bygone times. There were peer to peer systems. Some people however had the resources to gain an overview and provide their peers with global maps. I'm really awfully sorry but I simply don't see any longer what is ephemeral about the digital: even data have bodies that you can imprison, torture, suppress and kill.

There was this performance (by the Viennese actionists?): Having written Schroedinger's equation on the blackboard, a physicist is engrossed in the calculation of the hydrogen atom. A young woman in the audience is making a nuisance of herself. She chants some esoteric stuff and shakes with raucous laughter. After some time the physicist turns round and slaps her across the face. One of these days I must find out the source for this.

HB: We have adopted Schroedinger's cat to illustrate our take on the leaked and circulating documents. In our work the two different states play a crucial role. We have coined the term »Foriginal« for the quasi synchronicity of original and fake. As a term, it manifests our thinking. We understand the world as one gigantic experiment and find an analogy to ourselves and our perception of reality in Schroedinger's cat. The only thing is there are not just two states, there are infinitely many, both conceivable and inconceivable ones. This also provides the link to the parallel universes, to whose physics I don't have the slightest clue. I was chucked out of school when I was 14 and I consequently lack even a rudimentary knowledge of mathematics, chemistry and physics. However, what turns me on most manifests itself in another installation. A CCTV control room is both the beginning and the end of the installation and each of the four monitors shows in split-screen mode four parallel universes of one of the projects in the exhibition plus *Oldify*, *Icons*, *Superenhanced* and *Do You Think That's Funny?* So we have these four parallel realities, which are all included in the universe of this project. This is food for thought, I must say, and my sleep these days is partly disturbed and partly non-existent. My little daughter Lola (six), incidentally, has also woken up almost every night for the past few months, declaring she can't go back to sleep because she needs to think about infinity, which she is finding impossible; she's looking for a way to form some idea of the unending and the infinite ...

TN: Your daughter should make a beeline for the basics of set theory, that might prove helpful. It teaches you to distinguish between several kinds of infinity and what uses this distinction can be put to. In physics even the energy of the vacuum diverges but this may well be a theory-engendered artefact (as is the case with most infinities; in practice it's not nearly as bad). If you find an antidote for a particular infinity you may well be on

the road to a Nobel prize (e.g. for renormalisation of certain field theories). So if she has got a hankering for infinities, she's got her work cut out! The world is everything that is the case and that may be the case (Wittgenstein and Zeilinger). The key idea is this: merely raising or bringing down the curtain on a possibility may make all the difference in quantum physics, even if that possibility is never realised. This is also what I experience on the existential plane: it makes no end of difference whether I believe a different world, a different life, a different me are conceivable or not. Evolution consists in sifting through the possibilities aided by feedback and memory. Physical reality stabilises itself in a pre-real process that allows all possibilities to mingle in an unrealised form; some are deleted, others stabilise each other. The possibilities we call reality are those that insert themselves into a positive feedback loop in the course of their encounters with the possibilities that are held out to them by the environment and establish a footing in this way. All that is needed in the beginning is the possibility of possibilities and a dose of unrest...

Exhaustion, Entropy and Pandora's [Black] Box

HB: I am about to complete *Kayla, 8-bit Key Ring*, a multiple in an edition of 100 + 2 A.P. In this context I've stumbled on this quote by Harald Katzmaier. What interests me is the physiology of exhaustion, also with regard to machines and as a physical reality, as a possibility. The installation *Do You Think That's Funny?* is a kind of exhaustion machine and someone like Edward Snowden is the archetypal exhauster. He is able to paralyse entire megasystems with his own hands, as a person, as a private entity; he is equally able to hyper-activate them and provide a lot of money for them. His actions resonate far and wide. And if it is true what Harald Katzmaier says, the systems will always end up exhausted:

Data are being described but they are not understood. I know from my own experience how hard it is to make significant sense of oscillating real-time data. It is only when fast data of the kind you get from Twitter and Facebook can be related to slow data associated with, say, ownership, rituals and kinship relationships that understanding gradually sets in. Meaning depends on understanding how a concrete part is related to the whole. For it to materialise requires in-depth knowledge, historical, sociological, psychological and economic knowledge, to produce knowledge and insights from a mere accumulation of data. Not to mention wisdom, which is even more arduous to come by because it is to do with the capacity for tolerating ambiguity. This is diametrically opposed to the discrete unambiguity of machine language. Whoever wants to take control of all relationships and "flows" in the world must necessarily fail, must utterly exhaust themselves in the attempt.

— Harald Katzmaier,
Director FAS.research, Austria

TN: Yesss: Anyone who wants to grasp a complex state of affairs without reducing its complexity must at least themselves match the complexity of that state of affairs. Hasn't the NSA got a staff of 100,000 and all the difficulties in the world to keep control of itself? The idea that you might overwhelm secret services by inundating them with data has been around for a long time but I'm afraid these people know in the meantime what they're looking for.

Intelligence arguably means, among other things, an ability to adequately reduce complexity so as to isolate those patterns in the sea of raw data that you believe are relevant. At CERN, I took part in programming the “attention machines” that are directly attached to the giant particle detectors to reduce in real time their wildly excessive data output by a factor of 100,000. They do this by concentrating exclusively on the interesting collision events. You may of course object to this by saying that in this way nearly everything gets dumped and that the clearly defined search patterns you’re applying make you blind to other phenomena that you didn’t expect. Yet this is the only way to see anything at all – and it does not preclude discovery by any means.

Physicists feel drawn both to small systems, which it is possible to understand in their entirety, and to huge ones (e.g a gas consisting of 10^{23} atoms) that maintain a state of balance. In these huge systems individual elements are no longer important because you can switch from the individual to the collective level: instead of talking about the speed of each individual particle in the gas all you’ve got to focus on is the pressure of the gas. All other details are irrelevant to predicting the gas’s behaviour.

Seen from that perspective, human societies are medium-sized systems that are difficult to understand on both the individual and the statistical macro level; in addition to this, they are not closed systems in a state of balance. They are evolutionary networks that keep on changing their own framework conditions and elements. Some phenomena in such complex systems can be understood quite well from computer simulations. A few months ago, the EU decided which two “Future and Emerging Technologies Flagship Projects” to award the largest ever grant to. One of the projects on the shortlist was “FuturICT”, which proposed to develop “planetary scale computing facilities... [in order to] provide the means of analysing data and managing complex events”, such as man-made disasters, conflicts, etc. In the end, this particular grant went to another project, the “Brain Simulator”, but it was obvious that the will was there to learn from data. As Katzmaier puts it: understanding is more than being able to gather and analyse data. But of course the latter two activities constitute a precondition for understanding and it seems self-evident to me that our computers can help us to learn from our data.

Anyone who wants to take control of all relationships and flows wants to prevent time from passing. If no information is allowed to be leaked, every operation remains reversible: Just as a quantum computer is a reversible computer, a quantum coherent system is always time symmetric, can move backwards and forwards, no order is ever lost. Exhaustion on the other hand means that your own entropy has increased, that the order that you represent is showing signs of coming unstuck. Anyone who wants to create facts and go down in history should smash up something and ignore something to make the arrow of time irreversible. The surveillance society and the quantified self want to reach stasis, put a stop to aging, and allow frictionless forward and backward movement in time. It is the ungathered information, the black box that has not been opened, and the unused possibility that enable the world clock to continue ticking.

Chemical Cyborgs, psychotic networks and consensual hallucination

HB: Another topic that is never far from my mind and that I’ve taken up again only recently is psychosis and/or the existence as a chemical cyborg that results from it. I’ve dealt with my bipolar disease in visual and code based terms in the *Psych | OS* cycle. In

what you might call a sequel to the cycle I meet up in every city that I visit with mentally disturbed people. We talk and if I get their permission I take photos of them that end up as grid paintings for people to arrive at their own interpretation of them. What interests me in particular is the chemical cyborg I’ve tried to put the basic facts into a short text that accompanies the cycle. It goes like this:

Hans Bernhard is a chemical cyborg. Hans Bernhard has been exposing, pushing, augmenting and enhancing his body with synthetic drugs for 25 years. From 1984 to 1999 through the intense use of synthetic drugs such as LSD, ecstasy, meth, speed, fentanyl, angel dust, dextroamphetamine and nitrous oxide to explore, interact with and absorb contemporary digital networks and become part of them by zooming into techno music, digital art and mass media. Since 2000, he has been protecting and enhancing his brain and body by the use of prescribed psychotropic drugs: Benzodiazepines, Olazapine, Seretide, Prothipendyl, Valproic Acid, Carbamazepine, Chlorprothixen, Zotepin, Oxymetazoline, and Salbutamol; all interacting with one another. During his 25 years of substance abuse and after a series of brain upgrades, one day in March 2002, Hans experienced a manic outbreak and total mental meltdown in South Africa. This would later on be diagnosed as bipolar affective disorder and Hans would learn that he had prevented the outbreak of the illness for almost 15 years by means of self-medication. Hans Bernhard’s neuro-networks and brain structures are similar to the global synthetic TCP/IP networks he helped to build and to which he kept a close and subversive relationship. Both are highly unstable. And now, these networks are infected and contaminated by waves of mania and depression (WHO ICD-10, F31.1). Contemporary high-tech societies deal with hardcore brains using biochemical agents to enhance & control the internal information flow, we call them psychotropic drugs. We are all chemical cyborgs.

TN: Cyborgs ignore the old distinction between your own body and compatible components such as implants. I consider myself to be an electromagnetic cyborg. I am able to experience and express myself with the help of electromagnetically mediated plug-ins. I do that in microscopy, with microwaves, lasers, individual photons, fast and programmable logic chips and also through touching. Touching is seeing is eating is brain chemistry is breathing. Electromagnetism wherever you turn, exchange of photons. I bump against bodies because electrons, following Pauli’s exclusion principle, do not want to share the state of their peers. All these electromagnetic prostheses do not appear alien to me; fusing their interests and peculiarities with mine is a cake walk. I’ve just run 15 km, breathing the air in the woods. This too is part of my electromagnetic world, with green photosynthetic molecules characterised presumably by long-range quantum coherence, a precondition for the efficient transport of energy to the reaction centre of the antenna molecules.

Far more likely to cause rejection symptoms in me are social implants: the most important parts of machines are not those made of steel or silicon but of an amalgamation with language, norms, education, fashion, and power. But you’re well advised to put yourself on a good footing with these social actors as well. Being language, relation, and symbol, they are also always electromagnetic, which is good news to a certain extent; but these social things are not always what I would call good-natured, they always have plans of their own and always seem to know what they’re after. That strikes me as alien.

The Kindle Forkbomb: The importance of Moral and Electromagnetic Backbone

HB: Cybernetics is at the top of my mind too, seeing that I'm in the middle of assembling a spatial installation in Kunsthall Aarhus called *The Project Formerly Known As Kindle Forkbomb*. 100,000 A4 pages of YouTube commentary march forth from the wall – in the guise of a paper sculpture, i.e. stacked sheets of paper. They are then processed by a machine rendered as a symbol printed on the floor. The machine's output consists in ready-to-use e-books, which are then uploaded to the Kindle shop and sold there. What we get here is on the one hand the development and presentation of a new genre of literature and, on the other, a cybernetic process, as the books subsequently receive a commentary in a loop that can go on for ever. Time is the only relevant factor, which introduces a sort of line, a kind of consistency into this permutative verbal universe. And of course it involved fights with Google (YouTube) and Amazon (Kindle shop); their terms & contracts have begun to replace parts of the national constitutions. There are no binding rules for a situation in which Google with its YouTube arm is involved in a legal confrontation. There is no court of arbitration or other supranational court that the case can be referred to. I see a great deal of potential for conflict, subversion and a resulting exhaustion.

TN: The conceptual roots of cybernetics lie in the physics of noisy channels (Shannon), in limnology, electrical engineering, physiology, and a couple of other disciplines. In the above-mentioned cases it is obvious that these are causal, physics-based circulatory processes. At some stage the inevitable materiality of information was lost, the inevitable noise on the signal was made irrelevant by resorting to the exclusivity of the two manic states of an amplifier: absolute silence (0) and total overdrive at maximum volume (1). This ensures the robustness, repeatability and clonability of the information that has been captured and encoded in this way but bleeds so much possible correlation into the heat bath that the digital whole never contains more information than the sum of its component parts. Towards the end of the Macy Conferences⁷ minutes you will find the suggestion voiced by a biologist that reduction to the digital computer may be an illegitimate shortcut; and all the digitals had to say in response was to ask him to shut up.

If you choose not to ignore any longer that every information needs at least one photon as physical carrier, you are already thinking the quantum computer (Richard Feynman was the pioneer here). The separation of information from materiality was productive for a long time and is not without its attractions. In my field people are recalling an even earlier era and are beginning to capture physical interaction in the vocabulary of information theory – which turns out as eminently productive.

Google, YouTube and Amazon instal their servers in certain countries, hitch up their cables in the metropolises and are subject to the law of the countries where they do business. A Viennese student, Max Schrems, has kept reminding Facebook over the last few years that even though they may get away with channeling intellectual property to brass-plate companies in Ireland to evade taxes, they are still subject to the data protection laws of the European Union and that the rights resulting from this situation are even actionable – which also results in a huge amount of printout on paper. I really have no clue as to why people simply couldn't care less about all this transnational surveillance,

⁷ The Macy Conferences were a set of inter-disciplinary meetings held in New York from 1946 to 1953 to set the foundations for a general science of the workings of the human mind. They led to breakthroughs in systems theory, cybernetics, and what later became known as cognitive science.

tax evasion and the exploitation of employees. What I do hope is that some time soon civil societies will stop staring at Facebook, Apple and PRISM like a rabbit hypnotised by a cat. Time was when people kicked up a great deal of fuss about the collection of data in the context of the census and demanded a more rigorous data protection regime. By the time we have completed building the quantum computer (which is still some way off but it will happen) no classic encryption will be worth a cent. And we will no longer have the moral nor electromagnetic backbones to do anything about it.

HB: We've seen a certain despecialisation. Over the last 10 years we have undergone a process of generalisation. We used to be focused on Net.Art, on code, concept and web based art usually in the form of projects and real life and online performances. Ten years ago we felt dissatisfied with the situation in which we found ourselves. An increasing ghettoisation was making it impossible for us to move freely in the art scene and especially in the art market. This is why we changed our strategy and it has worked out, we've adapted our projects to the overall situation, which makes me delighted. For us life is inseparably connected to art. I wouldn't know if it is therefore justified to use the term *Gesamtkunstwerk*. What interests me right now is what I feel, what problems I've got, diseases, deaths, love, sex; and the interaction with, and the emotional world of, my children. All this flows into the artistic process; not a lot flows in the other direction, come to think of it...

Vienna, Boston, Aarhus, London, September 2013.

Translated by Otmar Binder, Vienna.

Contents

1. UBERMORGEN.COM - MEDIA HACKING VS. CONCEPTUAL ART, Hans Bernhard / Lizvlx. Alessandro Ludovico (Ed.), Christoph Merian Verlag, 2009. ISBN 978-3856164607
2. UBERMORGEN, u s e r f r i e n d l y, Carroll / Fletcher, 2013. ISBN 978-1-908923-07-3
3. Images with captions of the works in the exhibition.

UBERMORGEN

UBERMORGEN have exhibited in museums and galleries internationally since 1999, including HKW, Berlin; MUMOK Museum of Modern Art, Vienna; MACBA, Barcelona; Ars Electronica, Linz; SFMOMA, San Francisco; Witte de With, Rotterdam; Centre Pompidou, Paris; New Museum, New York; Malmö Konsthall; NTT ICC Museum, Tokyo; MoCA Taipei; Lentos Kunstmuseum, Linz; WRO Media Art Biennale, Wrocław and Prague; Sydney and Gwangju biennales. Their work is currently included in *Systemics #2: As we may think (or the next world library)*, Kunsthalle Aarhus, Denmark, which runs until 31 December 2013. Awards include ARCO Beep, Swiss Art, Ars Electronica and IBM New Media.

Magda Tyżlik-Carver

Magda Tyżlik-Carver is an independent curator working primarily within the network context. Her curatorial work is concerned with projects that critically utilise online networking tools, such as wikis, Skype, iChat, and offline public spaces and galleries. Tyżlik-Carver is a PhD researcher in KURATOR/Art & Social Technology research group at Plymouth University, UK and an associate curator at KURATOR. She also works as Research Assistant at University College Falmouth, UK. Recent curatorial projects include *Ghost Factory* (2013); *common practice/code and common practice/language* at Arnolfini, Bristol (2010); *playing practice* (2009); *(in)Visible Networks* (2008); *Participation* 2007.

Tobias Noebauer

Tobias Noebauer (b.1980) is a scientist, cultural worker and activist based in Vienna, Austria. He graduated from the University of Vienna and Technical University (TU) Vienna in Physics and Sociology and holds a PhD in experimental quantum information physics from TU Vienna. He is currently a postdoctoral researcher at the Vienna Center for Quantum Science and Technology. Noebauer has worked at the European accelerator lab CERN in Geneva, Switzerland, and published on FPGA-based data analysis, hybrid quantum systems and quantum-enabled sensing.

Edward Snowden

Edward Joseph "Ed" Snowden (b. 1983) is an American computer specialist and a former CIA and NSA employee who deliberately disclosed classified details of several top-secret United States and British government mass surveillance programs to the press. Snowden's release of NSA material was called the most significant leak in U.S. history by Pentagon Papers leaker Daniel Ellsberg. On June 14, 2013, United States federal prosecutors charged Snowden with espionage and theft of government property. Snowden fled the United States prior to the publication of his disclosures, first to Hong Kong (China) and then to Moscow (Russia), where he was granted political asylum by the government of Russia in late July 2013 and where he now resides at an undisclosed location.

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Carroll / Fletcher