

Art, science, technology and society

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Abstract

There are artists who appropriate scientific discoveries and technological innovations that shape the world to represent it differently. Emerging artistic practices resulting in the use of digital and network systems, like bio or nanotechnologies, improve our understanding of contemporary society. The industrial robots of Robotlab, by copying the Bible in a museum, incite us to reconsider our relationship with these successors of the automatons that were formerly exhibited in salons. As for Marion Laval Jeantet of Art Orienté Objet, it is the barriers between the human and the animal that she encourages us to reflect upon when she has herself injected with a dose of horse immunoglobulin. The performance continues with blood samples that might be called “centaur’s blood” being drawn from her veins. In this era of globalization, there are artists who exploit the services of the Internet to draw up planetary maps, or activists that address the question of privacy by hacking social networks. What then can be said of Frederik de Wilde who proclaims the creation of the “blackest black in the world” with nanotechnology researchers, where an action in the infinitely small, which goes above and beyond industrial issues, takes us straight to the symbolic?

KEYWORDS: art, digital, media, science, society, technology

Introduction

Our knowledge of the world is evolving along with scientific discoveries, which are at the origin of technologies shaping society and for which art gives us the best reading. Artists have always made use of the techniques and technologies of their times while exchanges between the world of art and the world of science take place more often than one might think. And this has been the case for a very long time if we consider the view of Philippe Codognet:

Galileo was the first to actually “see” the relief of the moon, in all likelihood because of his training in fine arts (geometry of shadow casting and chiaroscuro), making this event a landmark in the mutual influence of Art and Science. (Ancient Images and New Technologies: the Semiotics of the Web, 2002)



Howard Boland and Laura Cinti, *The Martian Rose*, 2007-2009.

Today we speak of practices that combine art, science and technology as “emerging” and there are festivals such as Art Outsiders who echo this. The 2009 edition of this Parisian event was dedicated to the *Art of Extreme Environments*. Howard Boland and Laura Cinti presented their installation, *The Martian Rose* there, which is the artistic result of a laboratory experiment. They are among the artists in fact whose practices correspond very little to an art market that is too formatted. So they have turned towards research while exposing their art works to the public of festivals whose reactions are much better than those of museums. The rose they exhibited during Art Outsiders 2009 bears witness to the extreme violence of an experiment that took place earlier at the Mars Simulation Laboratory at Aarhus University in Denmark. The rose was subjected to six hours of the atmospheric conditions of the red planet. The two artist researchers, who are the founders of C-LAB in London, remind us that:

Mars is a cold place with plummeting temperatures from -60°C down to -130°C, the atmospheric pressure is only a hundredths of earth's, much lower than on Mount Everest, the prevalent gas is carbon dioxide and UV light penetrates an unshielded atmosphere (Exposing Roses to Martian Atmosphere, 2009)

Giving this flower, which symbolizes romantic encounters, as an offering to a planet where it will never grow seems rather hopeless. Especially when we know, before ever having even set foot there, that the atmosphere of Mars is entirely unsuitable for us. It is interesting to note that in 2003 the Art Outsiders Festival also focused on the possible relations between artistic practices and the conquest of space. Indeed, has it not been through photography that we became aware of the extreme fragility of our habitat when rocket ships first escaped Earth's gravitational pull and sent back images of our planet? It would seem natural then that artists would also attempt to go beyond the limits, if only symbolically, of the forces that restrain them.

From Global to Local



Gwenola Wagon, *Globodrome*, 2009-2011.

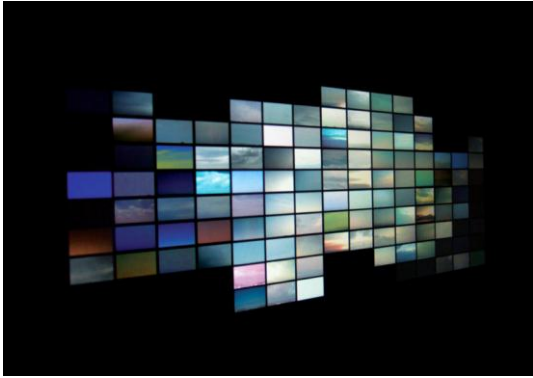
The American company Google has significantly contributed to the popularization of satellite images in only a few short years. Its application, Google Earth, allows us today to travel the earth without having to move at all, and that is precisely what the artist, researcher Gwenola Wagon, has done. She isolated herself from the world to do a tour around the world in 80 stops that she recounts in a blog, which takes the form of a book like those in conferences that appear to be performances. She explains on *globodrome.com* how she activated all geo-localized data offered by Google Earth to make her world tour at the slow pace of Phileas Fogg and Jean Passepartout while following their route. We are told that Jules Verne surrounded himself with maps to imagine his voyages. Gwenola, on the other hand navigated above the map of maps between 2009 and 2011. She examined the data uploaded by anonymous contributors on Panoramio and YouTube and other services of the Web 2.0 – there is a truth inherent in images of amateurs – whereas Jules Verne, in his time, collected information from scientific journals. Gwenola Wagon, just like Jules Verne, has visited the world by proxy, the one following the traces of the other. But Phileas had to go as fast as he could to win his bet while Gwenola took the time to lose herself among the servers of the entire world on the information trails.



Maurice Benayoun, *The Mechanics of Emotions - Still Moving*, 2008.

There are many ways of representing the world in the era of globalisation and in 2005, Maurice Benayoun hacked another service of the American giant for his series entitled *The Mechanics of the Emotions*. A professor and researcher at the University of Paris 8 and a digital artist since the beginning of the 1990's, he has conceived an application that allows him to draw upon Google News by automatically multiplying the requests associating human emotions with the names of cities. Likening the Internet to a “global nervous system”, he obtains three-dimensional cartography of the planet where the size or position of words representing human emotions are relative to the repetitions of their associations with various cities of the world. Such maps have allowed him to conceive various works of the most diverse forms, ranging from installation to performance. But all of them reveal the same absences. Maurice Benayoun explains to us:

“The information conveyed by the search engines, brings us daily a system of responses, which is supposed to reflect a sociologic, geographic, scientific reality. But, this system is affected by a linguistic (English language predominance) and technologic (geographic predominance of industrialised areas) filtering. Which representation of the world can we obtain through the network? Too often considered as the world nervous system, the Internet seems to neglect the phantom limbs of the planetary system: Africa, becoming an archipelago, is far from the reality of the continent, as an amputated limb, from which you would even not feel the ghost pains”. (Open Art, 2011)



Marie-Julie Bourgeois and Luiza Jacobsen, *Tempo*, 2008.

But why represent the world when all you have to do is simply, passively observe it. There are Webcams that film it uninterruptedly to do this, which artists like Marie-Julie Bourgeois and Luiza Jacobsen misappropriate to produce artworks. In 2008 they brought together a multitude of video streams capturing skies from around the world. The installation is simply called *Tempo* because it is punctuated by time passing – the sun rises here and then sets there. Every hour, fragments of sky from somewhere else shift to the value of one cell to the right so that the centre of the piece always shows the light at its zenith, at any time of day or night. The spectator, in their passiveness, is in the spot of they who observe the skies of the whole world from its centre. The terrestrial globe having “disappeared”, all that remains is the gassy envelope that is at the heart of our concerns today. For we are not content to simply observe, knowing that since the protocols of Kyoto, it is well nigh the time to act.

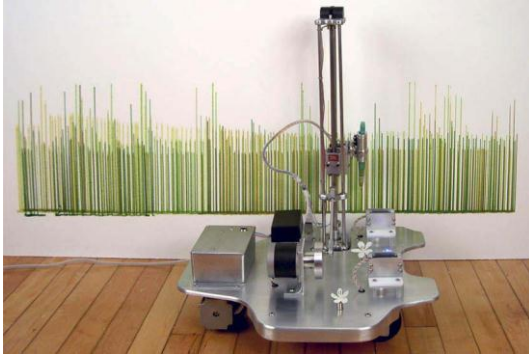


HeHe, *Green Cloud*, 2004-2009, source Niklas Sjöblom.

We can all get involved, even if it's only locally, if we were to follow the example of the members of the HeHe Collective who occupied the Ruoholahti quarter of Helsinki in 2008. Their one night performance was meticulously prepared during the residence Helen Evans and Heiko Hansen enjoyed with the support of the Finnish Festival Pixelache. During the evening of Friday, February 29th 2008, the inhabitants agreed to turn off their electrical appliances between 7 and 8pm. The two artists redesigned the plume of smoke coming from the impressive chimney stack of the Salmisaari power plant with a green laser during their operation entitled *Unplug*, hence the name of this performance installation, which was called *Green Cloud*. The building was linked to the surrounding habitations by the electrical network that supplies them. So the operators were able to inform the artists of the drop in energy consumption tied to the operation. Helen and Heiko illustrated the responsible behaviours of the inhabitants by enlarging the green contours of the cloud thus magnified. But the story doesn't end there because this action of a single evening is particularly well documented on

the project's blog. Not to mention the digital festivals whose concerns have shifted from the technological to the societal who gave awards to *Green Cloud* the following year!

Exchanges and relationships



Sabrina Raaf, *Grower*, 2004-2006.

We all have an impact upon our environment, consciously or unconsciously, if only by our simple presence. At the same time, there are robotic artworks like *Grower* by Sabrina Raaf that are articulated around a form of interaction, by the presence of people, which could be qualified as passive. The little *Grower* robot, when it is introduced into a room, goes along the walls at the height of the baseboards. It pauses regularly to trace vertical lines that by their size reveal the variable quantities of carbon dioxide present in the room. The more we watch it, the more the lines, which resemble grass, lengthen. The activity of this artistic robot emulating the natural phenomenon of photosynthesis is nothing but a consequence of the pollution of the spectators. But its activity also informs us of the history of its presentation, which is, though entirely automated, intimately linked to those who observe it, to such a degree that there are spectators who project on to it, commenting on its determination or its reliability, which are human qualities. In this case, the spectators themselves give the show because artistic robots, in a general sense, tell us more about ourselves than their own *raison d'être* or “condition”.



Robotlab, *Bios [Bible]*, 2007.

Matthias Gommel, Martina Haitz and Jan Zappe, the members of the German collective Robotlab based at the ZKM, say:

Robots will play a significant role in future societies and invade more and more human domains. The most prevalent robots today are the industrial robots. Their number is rapidly increasing worldwide and has already exceeded one million. (Robotlab, 2000)

So shouldn't we reconsider our relationship with these machines that are assuming roles in our society, even if we hardly ever see them unless we are working in a manufacturing factory? Robotlab hacks industrial robots from their repetitive tasks in order to make up for this lack of confrontation, reprogramming them before presenting them in museums. In a performance entitled *Bios [Bible]*, a robot made by Kuka Robotics, tirelessly recopies the bible, both old and new testaments over a period of months. It is powerful, but it is its precision that we notice above all because it never makes a mistake, forgets or deletes anything. Its activity is like that of monk-scribes who disappeared with the invention of printing. Is it indeed for this reason that the robot respects the typographic codes inherent in the Gutenberg bible? Here again there are lots of comments from the public. The fact that the robot is performing one of the noblest human tasks undoubtedly contributes to the number of reactions the spectators project upon it, because art is an affair of relationships with the other, whatever that other might be.



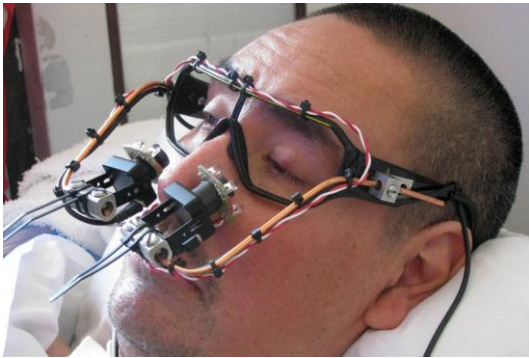
Hachiya Kazuhiko, *Inter Dis-Communication Machine*, 1993, source Mikio Kurokawa.

Lets forget about machines for the moment, without omitting interfaces, to focus on humans. While there are interfaces that link us to machines, there are others that allow humans to relate to each other. The device *Inter Dis-Communication Machine* by Hachiya Kazuhiko, was conceived for this purpose for two people. The participants are equipped with audio and video headsets through which they see what is in the other person's field of vision. Several scenarios are then possible, but they generally opt for the chance of meeting. It is then in communicating by voice that they must establish different strategies together. When they see one another, it is through the regard of the other, the one they are listening to at the same time. The experience is all the stranger when it involves accepting the idea of virtually entering the body of the other in order to find oneself through the other. It is only in experiencing it that one can fully understand this interactive artwork, which really takes on its full meaning when the two participants don't already know one another. And to fully appreciate this artistic experience implies forgetting the interface to better reconsider the meaning of the other, the one who is helping us find ourselves.



Daito Manabe and Ei Wada, *Face Visualizer*, 2008, source Jonathan Gröger.

The use of interfaces, including the practice of interactivity, allows digital artists to address the historical issues such as correspondences, a subject that was dear to Baudelaire, in another manner. It was in 2008 that Daito Manabe posted a video sequence on YouTube that would make him known around the world. We see him electrically stimulating his muscles like physiotherapists do to treat trauma. But here it is the muscles of his face that he connects to the sounds of electronic music. He no longer controls what we continue to read on his face, which is literally enslaved to the electric impulses. He has been giving the performance *Face Visualizer* ever since then, where sounds generate grimaces that reveal emotions corresponding strictly to the music. He also frequently gives workshops entitled *Body Hack* during which he “hacks” the faces of others. Dozens of people grimace together on video sequences documenting these collective experiences. They are all connected to the music that transforms them physically. They are united by what they perceive right through to their flesh; united by what penetrates their bodies. Is this not the dream of every dictator in this era where everything can be cut and pasted into Facebook as it can be into other media, to play upon the emotions of a group in which each member is enslaved by the same message?



Zachary Lieberman, James Powderly, Tony Quan, Evan Roth, Chris Sugrue and Theo Watson, *The EyeWriter*, 2007-2010.

There are also artists who have created interfaces since the beginning of the electronic age, that allow us to act virtually upon the world through media, images and sound. They are constantly putting efforts into new territories ranging from the industrial to the medical in order to experiment with the newest sensors that are emerging. They sometimes even manage, though it's rare, to have their research used beyond the artistic sphere. *The EyeWriter* is one of these digital technologies that links the world of art with that of the medical. A project that allowed Tony Quan, who was suffering from an Lou Gehrig's disease, to give himself over once again to the pleasures of graffiti. It was one of these DIY (Do It Yourself) projects where the artists and programmers brought together by Zachary Lieberman did not keep track of their time. The result was an Open Source ocular tracking system that cost around \$50 dollars. It was a much better replacement than the excessively expensive one Tony Quan, who is only able to move his eyeballs, was previously equipped with. When the members of the Graffiti Research Lab transmitted via Internet his new graffiti, video projected in the city of Los Angeles, he exclaimed: "That was the first time I've drawn anything since 2003! It feels like taking a breath after being held underwater for 5 minutes". The tracking mechanism being connected to an application allowed him to create dots on a screen that he could connect to obtain polygons so that once again, he was able to interact with the world.

Problems of Society



Aram Bartholl, *Dead Drops*, 2010.

Gerfried Stocker and Christine Schöpf, the artistic directors of the Austrian festival Ars Electronica which attempted to lay down the basis for a new cultural economy in 2008, say:

The age of copyright and intellectual property has reached its expiration date. A development that already manifested itself in the technical fundamentals of the Internet has reared its head in the actual practices of a young generation of users and is bringing forth a new economy of sharing and open access. (A new cultural economy - The limits of intellectual Property, 2008)

Digital technologies along with the Internet have in fact caused an upheaval in the relationship we have with art, culture and knowledge. At the same time, states, oddly being advised by the distributors of artistic and cultural content, try desperately to regain control through legislation. So artists like Aram Bartholl are having fun with this. During his residency at the Eyebeam in New York, still in 2008, he initiated a project called *Dead Drops* by sticking a USB key into the crevice of a wall in the city. Anyone can participate in the adventure, which consists of creating a point-to-point digital network that escapes all control. The project's website provides a few recommendations relative to the extension of the network of keys that allows anyone to upload or download any kind of digital content. There is no censorship or tax whatsoever.



Manu Luksch, *Faceless*, 2002-2007.

There is not a single societal issue that is not addressed by artists in this world where we feel constantly watched and spied upon, as there isn't a train station, street, parking lot or other public space today that isn't equipped with a video surveillance system. But there are still a few laws like the *Data Protection Act*, in the United Kingdom that protect privacy. So an Austrian artist living in London made use of this text, which precisely stipulates private or public surveillance companies must be able to supply the media upon which any petitioner appears to the petitioner, in order to make her film *Faceless*. Manu Luksch had a screenplay

that she progressively abandoned as the video sequences she requested gradually came in. The law stipulates that all faces, other than the petitioner, must be masked. So the filmmaker came up with the story of a person who realizes that her own face has been preserved in a world without faces. The aesthetic of this first feature length film made entirely with video surveillance cameras is itself inherent in the rules that comprise the *Manifesto for CCTV Filmmakers*. Directors adopting this manifest must, for example, refuse the use of any additional camera. Manu Luksch is therefore among these artists who use the technologies that shape our society in order to better analyze and criticize them.



Alessandro Ludovico and Paolo Cirio, *Face to Facebook*, 2011.

Strangely, our dread of being constantly under surveillance in the outside world goes hand in hand with our capacity to spread our private lives all over the virtual world. This is something that has not escaped the attention of artists who themselves invest in social networks. Paolo Cirio and Alessandro Ludovico began by conceiving a robot that collected nearly a million of these faces that represent us on Facebook. They then applied a technology dedicated to face recognition to separate men from women while classifying them. The 250,000 classified profiles retained thus allowed the two Italian artists to create a database for a fake meeting site called *lovely-faces.com* that they were rapidly obliged to close. The most interesting aspect was in the reaction of the Facebook lawyers who demanded that they return the “stolen” profiles, which implied that our faces belong to Facebook. But according to what law, other than perhaps that of Los Angeles where Mark Zuckerberg lives? Is there an economy based on faces? Not to mention the notion of the original that digital technologies incite us to reconsider. Still, it is only with such actions that we can confirm our incapacity to control what we put on social networks and in a broader sense, on the Internet. The “undo” function, which is an integral part of personal computers that have changed the way we write and perhaps even the way we think, does not exist on the world wide web.



Hasan Elahi, *Tracking Transience*, 2009.

Facebook was created in 2004 whereas Hasan Elahi had already been publishing his private life on the Internet for nearly a year. But it was in 2002 that everything began for this

American artist originating from Bangladesh when the FBI arrested him in the Detroit airport. He was asked a lot of questions about his private life, with and without a lie detector. What was he doing the day after 9/11? Did he hide explosives somewhere in Florida? It was only after a few months of investigation that the FBI recognized they were on the wrong track, but they nevertheless recommended that Hasan Helahi inform them henceforth of his movements. So even though he travels frequently for conferences and exhibitions, he took them up on it quite literally while providing more and more precise details over time. Right up to the creation of the website, *Tracking Transience* in which he records everything through text and images, from flight numbers to his airplane meals, his timetable and expenses, without omitting his position, which is geolocalized in real time. We can know everything the artist is doing, give or take a couple of minutes. He has equipped himself with the ideal tool for avoiding any trouble with a police force looking for an alibi. His server informs him of the requests coming from the Department of Homeland Security, the NSA or the FBI! But Hasan Helahi has nothing to fear any longer since having made his private life public.

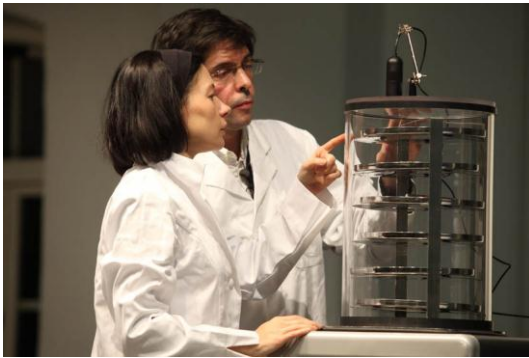


RYbN, ADM 8, 2011.

Since the world economy concerns us all, it is natural that artists such as the RYbN Collective should take an interest as well. They have developed an intelligent agent to which they gave 8,279 Euros before letting it loose on the Internet August 31st, 2011. Since then, they have controlled nothing because ADM is entirely autonomous. It buys and sells actions according to the trends on Asian, European, and American markets. It collects huge volumes of information on its own that allow it to anticipate the caprices of a world economy that has also become uncontrollable. But it is inevitably on the way to its own ruin because one day, it will make its final transaction. On January 29th 2012 after 151 days of existence, it gave itself no more than 2,205 days to survive in the pitiless world of finance. This works out to six years of slow agony the public can witness on the ADM project site. RYbN has provided the robot trader with a Twitter account that makes it possible for anyone to follow it in real time. And on the site of ZKM, there is an interview with ADM who answers with a synthesized feminine voice. When asked the question “Did RYbN create you to get rich?” the machine responds:

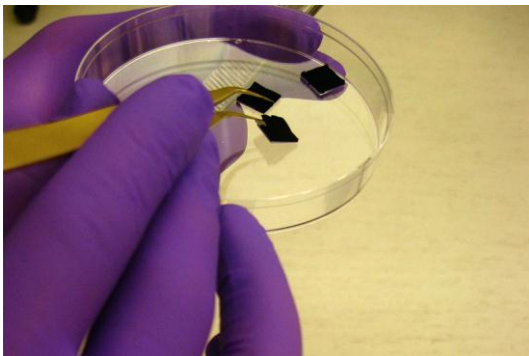
No, I have been created to be monitored until my bankruptcy” before specifying, “My source code is open and licensed under Creative Commons” to finally conclude: “Most of the crises and crashes are caused by human instability. A total automation of the market would result in a perfect auto regulated market. (ADM 8, 2011)

Bio and nanotechnologies



Art Oriented Object, *May the Horse Live in Me*, 2011, source Miha Fras.

While digital technology has insinuated itself into our daily lives these past decades, the festivals that were originally dedicated to the technological arts have opened up to other emerging practices. Ars Electronica, which is the doyen in this kind of event, is thus taking ever-greater interest in the living, to the point of creating a prize for hybrid works. In 2011, the Golden Nica for Hybrid Art was awarded to Art Orienté Objet. The French artists Marion Laval-Jeantet and Benoît Mangin who comprise this duo have conceived several works around the notion of hybrids beginning with the culture in a laboratory of little squares of epidermis combining their two skins. That was in 1996 when they symbolically crossed the barrier between the two sexes. In 2011 they broke another barrier when Benoît Mangin injected Marion Laval-Jeantet with a dose of horse immunoglobulin during the performance *May the Horse Live in Me*. He then drew a blood sample that they consider together as centaur's blood. Once it was freeze dried, the blood mixture evoking the mythological creature represented so often by painters and sculptors could finally be presented to the public. So should we not also reconsider our relationship to the animal world in this age of xenogeneic tissue grafts?



Frederik De Wilde, *Hostage*, 2010.

Eduardo Kac was among the first artists to make use of biotechnologies at the end of the 1990s while Frederik De Wilde was a pioneer figure for his use of nanotechnologies in 2010. To achieve this, he collaborated with research scientists at Rice University. But it was by taking a sample composed of carbon nanotubes from the Houston research laboratory and presenting it at an exhibition that the Belgian artist created his artwork. The title he gave to his ready-made is in direct relation with the specific properties of the material of which it is composed. He named the little square that absorbs practically all light rays because of its particularly weak reflection index, *Hostage* and thus claims he is the author of the “Blackest

black in the world”. This recalls Yves Klein who solicited the help of a chemist before adopting the blue he named “International Klein Blue”. The times have changed, just like the techniques and technologies, but these two artistic gestures are rather similar in their symbolic reach. Frederik De Wilde is also performing a pedagogical act by drawing our attention to technologies we know little about, though they are slowly but surely infiltrating our daily lives. But how can we grasp the large-scale artwork the Belgian artist is planning to produce that we might perceive as a hole in space, or the silhouette of a lack of something?

Epilogue



Antoine Schmitt, *The Grand Credits*, 2009.

What better way to conclude this obviously incomplete panorama of emerging artistic practices between art, science and technology than with the largest of all credits: *The Grand Credits of All Human Beings*. This is an artwork that was programmed by a French artist, Antoine Schmitt, that is accessible online at thegrandcredits.info. Whether we access it with a browser or see it when it is video-projected in a museum, all we see is a tiny part of it, the part that is reserved for us. Essentially, this piece works around a database and Christiane Paul reminds us that, “Though the concept of the database underpins all digital art in general, there are a lot of projects that make explicit reference to it.” (Digital Art, 2003) The database for the Grand Credits is enriched with first and last names whenever it is presented as the artist links it to festivals and art centre databases that receive it. Little by little it fills up, but will inevitably remain incomplete. Perhaps we are already in it, but the question remains: are these the opening or closing credits? And even more important, what have we done or must we do to merit these few seconds of fame?

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