

Agricultural biotechnology as a symptom

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What have women in general to do with GM crops, with robotics, or androids? Are there any opportunities considering genetic manipulation under emancipatory aspects?

Agricultural biotechnology, robotics, and genome editing can be read as – borrowing the following metaphor of the cultural anthropologist Victor Turner – hovering “betwixt and between” (Turner 1987) different intersectional levels.

It will be shown here that agricultural biotechnology and genome editing further an economically imprinted focus on life.

Neo-liberalism has forced life and living beings into the paradigm of high productivity. Yet, can living beings be measured under economic values? Of course they can.

We are going to investigate four very different examples that are connected to the following intersectional levels: the societal level, the technical, economic, ethical, medicinal, metaphysical, and the play level – regarding possible effects on society and ethics. On these intersecting levels we will see social injustice leaving its fingerprint. And this is exactly where these different examples meet again, and what they have in common: social injustice.

Love and hate, war and reproduction. First of all we are going to focus on what we love most – ourselves – the human species, and whether or not human-like androids can and should be allowed to evoke human feelings like love and desire.

We will then lay our attention briefly on fully automatized weapons as a possibility to make war less inflicting. At least for the most developed and wealthy war players.

In the end reproductive possibilities will meet reproductive rights, both from human, animal, and plant position.

A very important aspect of the first example is the distortion of Japan`s population pyramid. It is standing on the feet of too many too old people near to retirement. By 2035 approximately 50 per cent of all jobs in Japan could be performed by robots and androids (see Yumitori o.J.). Professor Ishiguro from Osaka University is one of the leading roboticists. After having engineered an android copy of himself, he and his team have first brought out the female android Geminoid F, and then Erica, which is, as Ishiguro said, the outcome of the average body of 30 beautiful women. The android can smile, frown, blink with the eyes, and move many parts of the body, which is covered with skin-coloured silicone. Pneumatic activators underneath the silicone allow to mimic the facial expressions of emotions.

Some intersectional levels in this example are obvious. The technical, the economic and the play level dominate the development of androids and robots. To overcome the technical challenge is very attractive not only for engineers, but also for the self-awareness of humans in general.

And in the end people need to be creative and play around with possibilities. We humans love to stretch as close to the impossible as possible.

Non-anthropomorphic robots that perform robotic movements in a velocity and timing that imitates a character, or feelings, have caused participants in experiments to develop feelings for the machines. They called those robots “him” or “her”, and valued the input, as they said they “trusted [the robot] more over time, as it seemed to anticipate what [they were] going to do” (Hoffman/ Breazeal 2007: 6f), whereas the robots with no upgraded timing were regarded as hampering the experimental outcomes (see GuyHoffmann.com).

The timing of the movements combined with a form that looks close to human and is able to perform most of the human work – especially unqualified work – confronts current and future societies with a bunch of problems on different levels.

Regarding high-tech as cultural development enables us to point out the intersectional levels as metaphorical markers for an initiation rite of passage towards cyborg-cultures (cf. Turner 1969; Harari 2016; Haraway 1991).

Nevertheless, the societal, medicinal and ethical level must in no case be ignored.

If more and more people are unnecessary for the job market, how can we as societies first of all guarantee a living for all citizens?

Discussions on unconditional basic income are no more luxurious, but essential.

Furthermore, all unemployed people need to occupy functions within society that are more or less important to a certain degree.

No society can allow giving birth to a sort of “human waste”, which as a result might lead to an abundance of angry young men and women, besides mental illnesses.

The more *human* androids look like and the more human *functions* they take over, the more societies have to determine their limits in advance. The lower house of German parliament, the Deutscher Bundestag, brought forth a draft law in 2003 concerning violence against human-like machines: androids. Since 2014 § 131 even forbids the presentation of violence against androids (Drucksache 15/1311:22; §131 StGB).

Violence against objects is called property damage, which can be sued if someone damages someone else`s property (§103 StGB; § 303 StGB). If he or she chooses to destroy their own things it`s their own choice.

Violence, on the other hand can only be committed against living creatures, as only they can *percept* violence. Just because something looks like a human, violence against dead matter will be sued more strictly than violence against living creatures, like plants. While civil law states in § 90a of the German BGB that animals are not objects, in German criminal law they are nevertheless treated as objects (Cf. § 90a, 3 BGB; Zopfs 2009).

If a living being is destroyed it is dead and the causal nexus cannot be withdrawn. The creature is dead. If a machine is destroyed you can either try to fix it or you can build another one. The causal circumstances of living beings and things differ essentially. So this amendment of the German Bundestag shows that there already has been a shift in perception from certain objects to living beings.

To judicially blur the difference between living beings and objects furthermore debunks a metaphysical notion. To speak metaphorically humans are no longer one species amongst various others on this planet, but have worked their way up to becoming a sort of semi-gods who create other species. Might they be humanoid like androids, or genetically modified “new species” (Rifkin 1998; Harari 2016).

So when on the one hand future emotional relationships between humans and androids seem to be possible (Hoffman et al. 2014; Nishio 2017), and violence against them is sued, when emotions towards human-like robots are so to speak furthered, why should sex with them be forbidden then?

Dr. Kathleen Richardson, Senior Research Fellow in the Ethics of Robotics at de Montford University at Leicester has founded the "*Campaign Against Sex Robots*" because in her opinion they would change human relationships, and the way we interact. She thinks they are an ongoing attack on human subjectivity (Richardson 2015).

On the other hand we need multi-faceted discussions on the use of robots and androids, also as possible objects of intercourse, because the gendercide in China and India through sex-selective abortion and neglect (Sen 1992; Sen 2003) has resulted in a distortion of the sex ratio, which causes violence, poverty and the loss of human capital. The 2000 census data made alone in China nearly 41 million "missing women" visible (Jiang/Li/Feldman/Sánchez-Barricarte 2012).

Societies only work on the grounds of how certain things should be done, what is normal, and which behaviour is antisocial. According to Baumann and Lyon, present societies are characterized by liquid surveillance. Not only delinquency, but also everyday activities are, so to speak, potentially under observation (Baumann/Lyon 2013).

Observation only makes sense if the observed operations are categorized and assessed. From this it follows that underlying normative values also play a role, even when not marked as normative. Hence, it is stated here that normativity should always be reflected by an iteration loop to take account possible side effects and results of this normativity.

As we have seen in our example, the normative attitude of Richardson is very important, concerning possible negative outcomes of sex robots within relationships. Thus, the intentional reflexive re-entrance of the normative account makes clear that those normative standards – in all likelihood – can never be pulled through within the whole world-society. Discussions on the functions and ethics of robotics and androids should under no circumstances blend out the various cultural and political variations in which the new technologies are embedded.

Yet, should the discussions and juridical foundations of the enculturation of the new technologies be only grounded on Western ideals and needs, the result would be a new colonization of the minds.

We must face uncomfortable outcomes and side effects of former political measures, technologies and interventions, as the former distribution of portable ultrasonic devices to Asian countries, and as an effect of sex-selective abortion myriads of missing women (Sen 2003) and sexually frustrated males.

Whether or not androids or sex-robots might be a short-term solution is not only prone to debate, but also to really existing needs and a market supply, otherwise social control would be forfeited.

We cannot afford to stop in a position like that of Richardson, as important as this position is. But we must go further and talk about the algorithms of all possible interactions with androids and sex robots we can think of in advance. If societies try to ignore the likeliness of a market for sex robots there will be no possibility to influence how people interact with them. The need is there so let's talk about how such conversations should be programmed that the possibility of them having bad influence on the legal rights of women, on everyday and sexual communication with humans will be minimized as far as possible.

Love and hate, war and reproduction. We are now going to approach our second example. The military use of drones, robots and androids has been under debate for quite a while. The US Pentagon is investing billions to develop autonomous weapons (see Foxnews-video; Scharre 2016; Work 2015). "Early adoption will be a key comparative advantage, while those that lag in investment will see their competitiveness slip.' And we believe this conclusion applies directly to the military competition we find ourselves in, and our work suggests that artificial intelligence (AI) and autonomy will allow entirely new levels of what we refer to as man-machine symbiosis on the battlefield. And our intelligence suggests that our adversaries are already contemplating this move. We know that China is investing heavily in robotics and autonomy, and the Russian Chief of the General Staff, Gerasimov, recently said that the Russian military is preparing to fight on a roboticized battle field, and he said, and I quote, "In the near future, it is possible that a fully roboticized unit will be created, capable of independently conducting military operations," unquote." (Work 2015)

Air craft and underwater drones are already used, the same as semi-automatic interceptor rockets, but the aim is to develop fully autonomous robots that decide **on their own** whether or not to kill humans in war times. The ethical implications of a fully automated war scenario reveal that not only the level of GNP of countries or the level of their high tech development will decide the outcome and severity of future combats, but also the refinement of the algorithms.

Contingency has always had its play in wars, but the mass of victims will in all likelihood exceed any past quantities. The new developments sharpen social injustice regarding war between different countries.

Beside profit maximisation and social injustice we can say that the neo-liberal paradigm stretches each development to the last consequences of the respective system. War is brought to perfection. More victims and destruction on the opponent`s side, lower costs and victims on the home side.

From love to hate we now approach the reproduction area. We are going to focus on animal, plant and human reproduction and will see that social injustice and speciesism are flanked by the euthanasia of possibly disabled humans in their early developmental stages.

Agricultural biotechnology has gone through different levels of – let`s call it normatively – de-naturalisation. Postmodern companies working in agricultural biotechnology very often emphasise the fact that the genetic selection of improved DNA has taken place throughout human history.

GM crops have been under dispute because of too much power to dictate and influence agriculture in general, and missing long-term experiments on the effects of genetically manipulated organisms on other organisms.¹ On the other hand they – at least in theory – make it possible to conquer famine.

GM crops make a Cartesian mechanistic trap visible in which postmodern agriculture is still captured. This mechanistic world-view makes apparent that plants, besides other species, are perceived as mere carriers of nutrients and DNA, which can be accustomed to different needs (cf. Weiß 2014: 311).

Yet, there has been a lot of research that induces a rather non-Cartesian approach towards our fellow creatures. Plants communicate via fragrance compounds with each other and with other species (Arvay 2016: 28, Köchlin 2016).

¹ Aris and Leblanc have proved the „presence of pesticides-associated genetically modified foods in maternal, fetal and nonpregnant women`s blood. 3-MPPA and Cry1Ab toxin are clearly detectable and appear to cross the placenta to the fetus.“ (Aris/Leblanc 2011: 5)

“They not only can respond to smell, taste, touch, sight and sound, like birds they can send electromagnetic waves”, Swiss biologist and chemist Koechlin points out (Koechlin on TED 2016). Under ground plants communicate with each other via mykorrhizae nets connected to their roots, and they also distribute water and nutrients.

When different species are genetically manipulated, their bodies and their existence are victimised and targeted towards social injustice. Genetic manipulation is not a function of time and contingency any more, but depends on human needs, and active human intervention. The agency has therefore shifted to wilful heteronomy, which is a sign for injustice. We have not only seen that women and emancipation have to do with GM crops, robotics and androids, but also that critical emancipatory discussion has to be opened towards an integration not only of gender, or different cultures, but also of the emancipation of other species.

Love, hate and reproduction have undergone a technical and genetic revolution, which makes social injustice more visible, and more acute. How acute social injustice even is for human life that only carries the *possibility* of being disabled we will see in our last example.

Prenatal diagnosis leads in 92 per cent to an abortion by the possibility of Down syndrome (Mansfield/Hopfer/Marteau 1999). Although prenatal tests like the diagnosis for Down Syndrome only display a possibility of being at risk, not a diagnosis, nevertheless most women choose an abortion when confronted with the possibility of giving birth to an “imperfect”, “deviant” body. Half of the time those tests have a false-positive outcome, which can even be higher – the rarer the condition, and the younger the women (cf. *ibid.*) The economic advantages for health insurance companies are blatant. No future long-term medical treatment without financial input of maybe disabled persons. The ethical choice is handed over to the parents, yet, without appropriate education about the informative value and risks of those tests (Daley 2014).

Disabled and chronically ill persons are a lose-lose situation for health insurance companies. This example demonstrates how economic interests have infiltrated social behaviour and reproduction standards.

Apart from the case that the results of prenatal diagnosis are *low-level probabilities*², and many healthy foetus are aborted, the question remains whether or not disabled people have no right to take part in society any more. Following the statistics at least the women aborting, the companies providing the tests, and the health insurance companies seem to have the conviction that disabled people have no right to live. Probably because they can't deliver at least the average human potential.

Is this the society we want to live in?

Quite at the beginning of this speech we saw that high-tech as cultural development enables us to point out the intersectional levels as metaphorical markers for an initiation rite of passage of humans.

² Esposito writes in her book „*Die Fiktion der wahrscheinlichen Realität*“: „Things develop completely different from all prognosis. No matter how severe the efforts to calculate the future, and to withdraw it from contingency, you can never be sure fictitious predictions of probability calculations will actually take place. But this has never been the purpose of a discipline that explicitly was developed as „calculation of reason“: She should merely reduce the insecurity of observers – she had never anything to do with the real way of the world.“ (Esposito 2007: 34f)

On the other hand, there is also the possibility of reading *betwixt and between* in a more metaphysical sense. In this reading humans are undergoing a rite of passage that transforms them from humans to a sort of semi-gods that not only *undergo* creation, but are able to initiate the creation and variation of life by genetic manipulation and the manufacture of artificial intelligence (Harari 2016).

In our examples we have seen that areas so different from one another as love, hate and reproduction, are perceived under the neo-liberal world-view of profit maximisation, no matter on which intersectional level innovations take place. We have also seen that agricultural biotechnology can be regarded as one symptom out of many for social injustice in highly technologized societies.

We have also seen that living beings can be and are measured under economic values. The question remains whether they should be.

The neo-liberal profit maximisation is an economic paradigm. Kuhn has showed that a paradigm infiltrates the complete world-view. Kuhn states "(...) *a paradigm is prerequisite to perception itself*" (Kuhn 1996: 113).

Are we humans allowed to do everything we can or should we rather consider not only basic human rights, but also basic animal and plant rights in all research, and the development of high-tech industry, agriculture, and biotech?

Apart from the expansion of basic rights to animals and plants, we also need to focus on the risk of a Western domination of world-ethics.

One possible solution to different cultures, paradigms and intentions might be an intentional reflexive re-entrance of normative standards to get hold of possible side effects and negative results. The here postulated reiteration-loop might assist multiple processes of negotiation between different cultures, different interests, and between economic and human interests.

Furthermore societies need to widen their definition of emancipation. We stand amongst many others on the shoulders of Pythagoras (Riedweg 2007: 54; Kompatscher-Gufler 2013: 14), Montaigne (2005: 213), Searle (2005: 135ff), when we emphasize that we not only need debates on human emancipation, but also on animal and plant emancipation, as they too play an important role in societies (Wirth/Laue/Markus/Dornenzweig/Bossert/Balgar 2014; Pfau-Effinger/Buschka 2013). Not only as food supply, but also as pets, comrades, means of therapy and research (Pepperberg 2008; Pfau-Effinger/Buschka 2013; Searle 2005; Donaldson/Klymcka 2013), and last but not least, as our fellow creatures – living beings.

Literature

Aris, A./Leblanc, S. 2011: Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada, in: Elsevier, *Reprod Toxicol* (2011), doi:10.1016/j.reprotox.2011.02.004

Arvey, Clemens G. 2016: *Der Heilungscode der Natur. Die Verborgenen Kräfte von Pflanzen und Tieren entdecken*, Riemann Verlag, München.

Baumann, Zygmunt/Lyon, David 2013: *Liquid Surveillance. A Conversation*, Polity Press, Cambridge.

Bekoff, Marc/ Pierce, Jessica 2009: *Wild Justice. The Moral Lives of Animals*, University of Chicago Press, Chicago/London.

Donaldson, Sue/Klymcka, Will 2013: *Zoopolis. Eine politische Theorie der Tierrechte*, Suhrkamp, Berlin

Foxnews <http://video.foxnews.com/v/5213335882001/?#sp=show-clips>; last access: 29 April 2017 19:56

Harari, Yuval Noah 2016: *Homo Deus: A Brief History of Tomorrow*, Penguin, London.

Haraway, Donna 1991: *A Cyborg Manifesto: Science, Technology, and Social-Feminism in the Late Twentieth Century*, in: *Simians, Cyborgs and Women: The Reinvention of Nature*, New York, Routledge, 1991, pp. 149-181.

Hoffman, Guy/Breazeal, Cynthia 2007: *Effects of Anticipatory Action on Human-Robot Teamwork. Efficiency, Fluency, and Perception of Team*, in: *HRI 07*, March 8-11, 2007, Arlington, Virginia, USA; <http://ai2-s2-pdfs.s3.amazonaws.com/59e3/78b9373a56576d7657ff8c0155d63487aa43.pdf>

Hoffman, Guy 2013: *Less than perfect robots*. TEDxTalk; <http://guyhoffman.com/category/morevideo/>

Jiang, Quanbao/Li, Shuzhuo/Feldman, Marcus W./Sánchez-Barricarte, Jesús Javier 2012: *Estimates of Missing Women in Twentieth-Century China*, in: Cambridge University Press, Cambridge. Doi: 10.1017/S0268416012000240

Kompatscher-Gufler, Gabriele 2013: "... nicht, um es zu töten, sondern um es zu streicheln." (Herbert von Clairvaux, 12. Jh.): *Literarische Dokumente der Tierliebe im Mittelalter*, in: Ullrich, Jessica/Weltzien, Friedrich 2013: *Tierstudien. Tierliebe*, Neofelis Verlag, Berlin.

Kuhn, Thomas S. 1996: *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago and London

Koechlin, Florianne/Ammann, Daniel/Gelinsky, Eva/et al. 2008: *Pflanzen neu entdecken: Rheinauer Thesen zu Rechten von Pflanzen*, https://www.blauen-institut.ch/s2_blue/tx_blu/tp/tpt/t_rheinau.pdf (last access: 10.04.2017; 14:27)

- Koechlin, Florianne 2016: Do Plants Have Dignity? TED talk;
<https://tedxinnovations.ted.com/2016/01/14/spotlight-tedx-talk-do-plants-have-dignity/>; last access: 27 April 2017: 13:08
- Mansfield, C./Hopfer, S./Marteau, T.M. et al. 1999: Termination rates after prenatal diagnosis of down syndrome, spina bifida, anencephaly, and turner and klinefelter syndromes: a systematic literature review, in: *Prenatal Diagnosis* 19, 808-812
- Montaigne, Michel de 2005: *Die Essais*, Anaconda, Köln.
- <https://www.mordorintelligence.com/industry-reports/europe-biostimulants-market>; last call up: 10. 04.2017, 18:28
- Nishio, Shuichi 2017: Investigating Human Nature and Communication through Robots, <http://www.geminoid.jp/en/publications.php>, last access: 27.04.2017, 11:38
- Nitto, Hiroyuki/Taniyama, Daisuke/Inagaki, Hitomi 2017: Social acceptance and impact of Robots and Artificial Intelligence – Findings of Survey in Japan, the U.S. and Germany; <https://www.nri.com/~media/PDF/global/opinion/papers/2017/np2017211.pdf>, last access: 27.04.2017: 11:12
- Pepperberg, Irene M. 2008: *Alex & Me. How a Scientist and a Parrot Discovered a Hidden World of Animal Intelligence – and Formed a Deep Bond in the Process*, HarperCollins, New York.
- Pfau-Effinger, Birgit/Buschka, Sonja (Hrsg.) 2013: *Gesellschaft der Tiere. Soziologische Analysen zu einem ambivalenten Verhältnis*, Springer VS, Wiesbaden
- Ramadas, Smitha/Kuttichira, Praveenlal 2016: Farmer`s suicide and mental disorders persepectives in research approaches-comparison between India and Australia, in: *International Journal of Community Medicine and Public Health*, 2017 Feb; 4(2): 300-306, DOI: <http://dx.doi.org/10.18203/2394-6040.ijcmph20170002>
- Ricard, Matthieu 2015: *Plädoyer für die Tiere*, Nymphenburger Verlag, München
- Richardson, Kathleen 2015: The Asymmetrical “Relationship”: Parallels Between Prostitution and the Development of Sex Robots, *ACM Digital Library, SIGCAS Computer & Society*, Sept. 2015, Vol. 45, No 3 290-293.
- Riedweg, Christoph 2007: *Pythagoras. Leben. Lehre. Nachwirkung*, C.H. Beck, München.
- Rifkin, Jeremy 1998: *The Biotech Century. Harnessing the Gene and Remaking the World*, Penguin Putnam, New York.
- Scharre, Paul 2016: *Autonomous Weapons and Operational Risk. Ethical Autonomy Project* February 2016, Center for a New American Security, Washington.
- Searle, John R. 2005: *Der Geist der Tiere*, in: Perler, Dominik/Wild, Markus 2005: *Der Geist der Tiere*, Suhrkamp, Frankfurt am Main, 132-152
- Sen, Amartya 2003: Missing women – revisited. Reduction in female mortality has been counterbalanced by sex selective abortions, in: *BMJ*, vol. 327, pp. 1297-98
Doi: 10.1136/bmj.327.7427.1297

- Sen, Amartya 1992: Missing Women. Social inequality overweighs women`s survival advantage in Asia and north Africa, in: BMJ, vol. 304, pp. 587-88.
- Shiva, Vandana 2014: The seeds of suicide: How Monsanto destroys farming, in: Global Research (<http://www.globalresearch.ca/the-seeds-of-suicide-how-monsanto-destroys-farming/5329947>; last retrieval: 25th April 2017, 12:26)
- Turner, Victor 1969: Liminality and Communitas, in: The Ritual Process: Structure and Anti-Structure, pp. 94-113, Aldine Publishing, Chicago.
- Turner, Victor 1987: Betwixt and Between: The Liminal Period in Rites de Passage, pp. 4-20 in: The Proceedings of the Ethnological Society (1964), Symposium on New Approaches to the Study of Religion
- Weber, Jutta 2014: Donna Haraway: Technoscience, New World Order und Trickster-Geschichten für lebbare Welten, in: Lengersdorf, Diana/Wieser, Matthias (Hrsg.) 2014: Schlüsselwerke der Science & Technology Studies, Springer VS, Wiesbaden.
- Weiß, Martin G. 2014: Nikolas Rose: Biopolitik und neoliberale Gouvernementalität, in: Lengersdorf, Diana/Wieser, Matthias (Hrsg.)2014: Schlüsselwerke der Science & Technology Studies, Springer VS, Wiesbaden.
- Williams, Gary M./Kroes, Robert/Munrot, Ian C.: 1999: Safety Evaluation and Risk Assessment of the Herbicide Roundup and ITS Active Ingredient, Glyphosate, for Humans, in: Regulatory Toxicology and Pharmacology 31, 117-165 (2000), doi:10.1006/rtp.1999.1371 (<http://www.msal.gob.ar/agroquimicos/pdf/Williams-et-al-2000.pdf>)
- Work, Bob 2015: Speech CNAS Defense Forum as Delivered by Deputy Secretary of Defense Bob Work, JW Marriott, Washington D.C., Dec. 14, 2015 (<https://www.defense.gov/DesktopModules/ArticleCS/Print.aspx?PortalId=1&ModuleId=2575&Article=634214>)
- Yumitori, Shuji (o. J.): Overview of Robot R&D in NEDO. New Energy and Industrial Development Organization (NEDO); <http://www.nedo.go.jp/content/100777818.pdf> (last access: 27 April 2017, 11:07)
- Zopfs, Jan: Der Tatbestand des Diebstahls – Teil 1, in: Zeitschrift für das Juristische Studium (ZJS) 5/2009; http://zjs-online.com/dat/artikel/2009_5_226.pdf last access: 27 April 2017, 14:37)
- Zurayk, Rami 2014: Global views of local food systems. Reflections on the growing worldwide local food movement. The agrarian limits of the food movement, in: Journal of Agriculture, Food Systems, and Community Development, doi.org/10.5304/jafscd.2014.043.018.