ANTHROPOCENE AS THE AGE OF THE TINKERERS
Hackteria Open Science Prototypes

Hackteria.org response to the anthropocene are open science prototypes, which support inclusion and democratization of knowledge. Instead of a TED talk grand narratives of the homo faber, who will save the world with the next technological intervention, Hackteria homo ludens builds playful prototypes to explore alternative cosmologies, empower niche communities, and resist military misuses of technologies.

"They alone will inherit the earth who live from the forces of the cosmos"
Walter Benjamin, One-way Street (p.113, Penguin classic, 2009)

The Anthropocene is an age, in which humans became a major geological force changing the landscape with agriculture, the earth sediments with mining and even the atmosphere with industrial activities. From the micro world of atoms and molecules to the macro level, where we plan to terraform whole planets, explore and exploit the universe, nothing will be left untouched by the human hand and mind. The rule of the "homo faber" represents a blind faith in progress, which will change our destiny for the better without moral or political intervention, just by pure transformation of the material conditions. The image of the maker and engineer described as "homo faber," who is in control of his fortune and destiny and who can even (mis)use politics to bring technological progress was first used in the 4.century BC. It was expression attributed to the great Roman builder of roads and bridges, Appius Claudius Caecus, whose last name (Caesus) meant "blind" for the reasons reasons, which remain mysterious and only hinted. Appius embodies the image of a man fighting the capricious nature, the chance and randomness of the universe.

This image of "homo faber" was further developed in the early Middle Age scholastic discussions about the reason and will of God as the powers, which humans should mirror and master to become the privileged "Imago Dei". Paradoxically, it was this theological obsession with the will of God as a power over the creation that inspired the scientific and industrial revolutions and the whole enlightenment project, which lead directly to the excesses of the 20th century communist and capitalist technocrats. We can still hear its echoes in the millennial and apocalyptic zeal of the Singularity and Transhumanist movement and their image of the (post)human creator of worlds. The imagined implosion of knowledge and power at the limits our matter and computing is after all expected behind every innovation coming from Silicon valley. When it doesn't bring the metaphysical "singularity," it can at least revolutionize this or that or save the poor, uneducated and the rest of humanity with the next TED talk.

Hackteria Homo Ludens

It is challenging to rethink the last two millennia of anthropocene as such various attempts to grasp our roles as makers and tinkerers involved in various metaphysical projects and cosmologies, which often remain unclear or assumed as intuitive. Hackteria.org projects refuse this unreflected Silicon valley cosmology and solutionism. Instead of the homo faber, they embrace the homo ludens approach to science and technology, in which prototypes serve a more complex role than bringing the apocalypse and saving some simplified version of the common world with the next right technology. They are part of the open science, open biology, maker and hacker movements revival of this forgotten and playful history of tinkering, which goes against the grand narrative of the homo faber. They question the solipsistic "creator of the world" (artifex, demiurge and homo faber) as just one of the possible metaphysical and cosmological ideas of how humans and gods relate to their material and spiritual offsprings. Instead of singularity, apocalypse, and various world saviors, destroyers and transformers, the Hackteria tinkerers believe in resilience and imaginative engagements with present science and technology, which simply means the prototypes serve idiosyncratic goals and groups. It can be the anarchofeminist and transhackfeminist agenda in the case of the recent "**GynePunk Mobile Labs and BioAutonomy"** **prototypes by** *Klau Kinky and Paula Pin from the PechBlenda (ES) collective* who use circuit bending to investigate the frontiers of biology, art and queer science. Their recent project democratizes and "liberates" instruments and protocols used in obstetrics and gynecology that would enable low-cost diagnostics, but also new experiments with human sexuality and "biological" freedom, for which they created an umbrella term "BioAutonomy" (1). The transhackfeminist bio-electro-chemical experimentation openly challenges the biopolitics behind present institutionalized women health policies with tools, such as the DIY microscopes and the GynePunkFuge for the analysis of various body fluids or the 3d-printable speculum designed in collaboration with another member, Urs Gaudenz (2). GynePunk technologies are good example of the type of critique of the patriarchal "homo faber" projects, whose vision of control is also behind biopolitical health policies. Also other projects and prototypes, such as Urs Gaudenz' low-cost and open source microfludic devices, such as "OpenDrop" or the new forms of sensors (Quartz-crystal oscillator), such as "wild OpenQCM" (3) explore new niches, empower marginal communities and provide access to the latest technologies. In the case of OpenDrop it is the science behind electro-wetting and control of small droplets of liquids, which can be used for rapid and automatic testing of samples, but also playful "lab-on-a-chip" devices used for artistic performances and even design of "games". In the case of the "wild OpenQCM" sensor, the resonance was used for including a micro Theremin device, which created a special type of microperformances, where instead of data we can hear the molecules interacting. Urs Gaudenz' tools connect microfluidics and similar new sensors with art, music, games and education not because of some posh bioart and new media art pathos. The hackteria tinkerer loves to build playful

prototypes to support the geek ethos of opening the black boxes around to explore new cosmologies and invite new groups to use and misuse technologies. Sometimes it is for the LOLs, but it can also serve the needs of various low income countries to build affordable equipment and enable amateur scientists everywhere to condict studies.

Serious Prototypes for Playful Cosmologies

Rather than a Silicon valley entrepreneur with his next planet changing technology for VCs and exits, the hackteria tinkerer is more like the 16.century mechanical philosopher combining science with art, literature etc. and her small projects serve very concrete communities, often also obscure interests. Like the mechanical philosophers and alchemists, she uses tinkering to voice her unique cosmology and politics in a more reflective and open way without claiming any superiority or evoking the motives of saving, redeeming or ending the world, but actually questioning the institution and current practices of science: are they democratic enough? Do they create inflated expectations? Are they just and inclusive enough to various regions, groups and minorities around the world? Are they playful and engaging, poetic and inspiring? Hackteria tinkerers simply refuse to suffer from the same type of the mysterious "blindness" attributed to Appius Caecus, who openly ignored the political and social challenges coming outside the engineering and technological realms. The long forgotten reasons for his blindness are only hinted, but they offer and interesting background to our discussion of the age of anthropocene as an age of more playful and reflective tinkerers rather than "homo faber". Appius was accused of disrespecting the traditional rites in the temples, conspiring with the plebeians in the senate to seize power, ignoring his political duties and misusing finances for his engineering projects. This old gossips summarize well the present science and technology policy challenges: progress sacrificing and disrespecting local cultures and minorities, populism and manipulation of the public opinion, corporate takeover of politics and every aspect of life. Even the great engineering project of the past, Via Appia, was named after Appius and we forget that if it was financed by public money in what appears to be a misuse of funds, which ruin the goals of good governance. The accusations remain ambiguous, but they are still haunting us in the various discussions on the ideal role of science and technology in the age of anthropocene. The public participation and inclusion in science, transparent and open financing of science and technology, patents, technological and digital divides and various calls for open science, they all question the power of the blind "homo faber". We know that technological and scientific fixes are not enough to compensate for a lack of good governance, virtue and justice. That they will never do enough for education, participation and simply inclusiveness, and that the pursuit for knowledge is as important as the pursuit for justice and equality.

In the present, we are disenchanted with the institutions of science and technology and we are facing an increasing need to rethink our role as tool makers, tinkerers, and

doers. Hackteria as a representative of these marginal movements of hackers, geeks and makers is trying to do that since its inception in 2009 and its numerous project (over 200) on all continents except Antarctica. If we would have to describe the lessons learned over these years, which can define tinkering in the anthropocene, then the main one is an insistence on prototypes and experiential learning rather universal solutions. Instead of providing solutions to problems as MIT and TED homo fabers do (with notable exceptions, such as Mitch Resnick's "Lifelong Kindergarten"), the Hackteria tinkers as homo ludens design and prototypes to play with other humans around the world. They believe that we have tools to engage and allow everyone to understand, take part, tinker, customize, but mainly to demystify the superpowers behind our science and technology knowledge and dreams. The goal is to liberate the cosmology from technology, but also from governance and to create more plural and critical engagement between knowledge, imagination and power. Hackteria tinkerers refuse all the millennial and apocalyptic discourse on saving, preserving and transforming, in favor of more participation and democratization of science. They want to make science more mundane, more accessible, an everyday affair, closer to our other practices, rather than an elitist and magical power, which serves the interests of the few.

Metaphysical Prototypes against Military use of Technology

The present crises in the anthropocene thus brought this new generation of tinkerers that have some of the sensibility of the Renaissance's mechanical artists and philosophers and their search for original cosmologies and new ways of orienting ourselves in the order of all things. The prototypes created by Hackteria are something we refer to as cosmoscopes, tools, which bring unique insights but also social experiments along with the knowledge and power (4). They embody the hopes Walter Benjamin voiced in his "One-way street essay" (5) summarizing the distraction and ambiguities of the early 20th century before he became its victim: *"Nothing so distinguishes ancient from modern man as the former's submission to a cosmic experience of which the latter is scarcely aware."* (6) He opposed the reduction of our cosmology to the new optical apparati as just one among many cosmic experiences we can have and strangely states that the default (he calls it classical) mode was intoxication, which creates a sense of community and transcendence (aura): "*Intoxication, of course, is the sole experience in which we grasp the utterly immediate and the utterly remote, and never the one without the other. That means, however, that communicating ecstatically with the cosmos is something man can only do communally.*" He advocates technology, which is open to cosmology as a relation, which is beyond our greed and need for control, which he warns lead only to the horrors of WWI use of forces, an unsuccessful even if "*new and unprecedented marriage with cosmic powers…. technology betrayed mankind and turned the marriage bed into a sea of blood.*" (7). Technology for Benjamin, just as for the Hackteria tinkerers is not about controlling nature, but exploring the relation between humanity, cosmos, especially and

the oppressed groups around the world (he uses the common reference in the 20s and 30s of the "proletariat"). The need for such "auratic" technology and cosmology means tools, which support personal and communal, close and distance experiences at the same time, just as hackteria prototypes created in sessions and workshops involving professionals and amateurs in open science projects.

The goal of the serious prototypes for playful cosmology is the inclusion of everyone in the new role of humanity vis-a-vis the cosmos and its various forces and scales, which we are slowly trying to tackle. Communicating ecstatically (and we can add playfully and creatively with the world outside through science and technology) means embracing such value of prototypes as probes into new collectives and networks rather than solutions perpetuating the status quo. The only other alternative to this "new and unprecedented marriage with cosmic powers" through prototypes is the total war, which another of the 20th century authors warns against in his story about the "Vietnam project" (8). J M Coetzee was also interested in the uncanny (when not reflected) relation of technology to mythology and cosmology, which often serves destruction. The start of the story shows the various possibilities of war propaganda and the misuse of technologies in Vietnam summarizing brilliantly the horrors of all our military apparati as an attempt to break the rule and limits of "mother earths". Behind all military tech sees are the cosmic ambitions of earth's "celestial sons" (humans and their rockets etc.), which try to break an old mythological story and leave mother earth to mate with new worlds: *"But has the master-myth of history not outdated the fiction of earth and heaven? We live no longer by tilling the earth but by devouring her and her waste products. We signed our repudiation of her with flights toward new celestial loves. We have the capacity to breed out of our own head…. In Indo-China we play out the drama of the end of the tellurian age and the marriage of the sky-god with his parthonegene daughter-queen. If the play has been poor, it is because we have stumbled about the stage asleep, not knowing the meaning of our acts. Now I bring their meaning to light in that blinding moment of ascending meta-historical consciousness in which we begin to shape our own myths".* (9)

Dusklands is probably the novel, which summarizes this dark side of homo faber and technologies involved in cosmology or anthropocene. Our tools and technologies are always part of some strange mythologies and cosmologies as much as various power regimes, and we need to question them, experiment, involve others and ultimately avoid the horrors of destruction, war and annihilation in order to define anthropocene as the age of the playful tinkerers rather than the destructors:

"For years now we have attacked the earth, explicitly in the defoliation of crops and jungle, implicitly in aleatoric shelling and bombing. Let us, in the act of ascending consciousness mentioned above, admit the meaning of our acts….They know our guilt at devastating the earth and know that our fiction of aiming at the 0.058% of a man crossing the spot we strike at the moment we strike it is a guilty lie. Press back such atavistic guilt! Our future belongs not to the earth but to the stars. Let us show

the enemy that he stands naked in a dying landscape." (10)

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(1) http://hackteria.org/wiki/BioAutonomy.
(2) http://www.thingiverse.com/thing:865593
(3) http://www.gaudi.ch/GaudiLabs/?page_id=392
(4) "Do-It-Yourself Biology (Diybio): Return Of The Folly Of Empiricism And Living Instruments" In Bureaud, Annick & Malina , Roger & Whiteley, L. (Eds.) *MetaLife. Biotechnologies, Synthetic Biology, A.Life and the arts*. Cambridge, MIT Press, Leonardo e-Book series, 2014.
(5) *One-Way Street and Other Writings,* Penguin Modern Classics, 2009.
(6) ibid. 113.
(7) ibid. 114.
(8) J M Coetzee, *Dusklands*, Vintage, 1998.
(9) ibid. 28.
(10) ibid. 30-31.