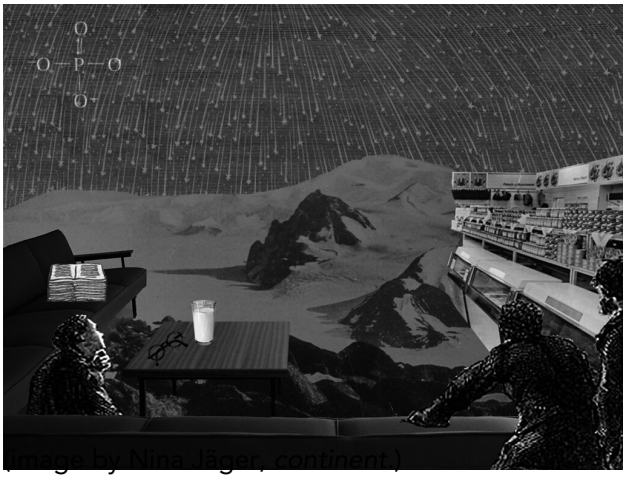
Arno Rosemarin

A Continent. Inter-view



(Image by Nina Jäger, *continent.*)

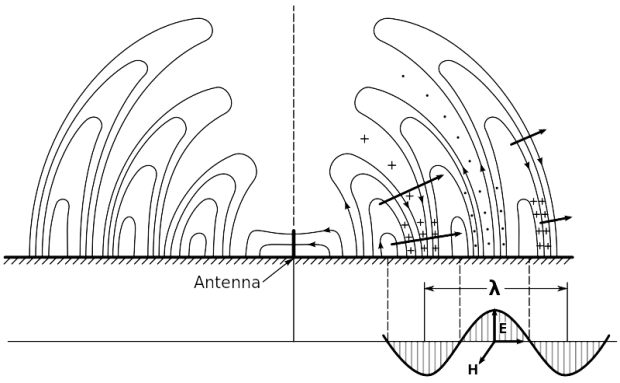
Arno Rosemarin is Senior Research Fellow at the Stockholm Environment Institute. His specialities include ecological sanitation, nutrient flows, eutrophication of freshwater and marine systems and aquatic eco-toxicology. He has carried out diverse projects including "Governance Surrounding Global Phosphorus Limitation", and participated in the 2nd European Sustainable Phosphorus Conference 2015 in Berlin. Rosemarin co-wrote The Challenges of Urban Ecological Sanitation. Lessons from the Erdos Eco-Town Project (Practical Action, 2012) as well as numerous scientific articles and reports. Most recently he penned "The Governance Gap Surrounding Phosphorus" with Nelson Ekane in the journal, *Nutrient Cycling in Agroecosystems* (2015).

cc.cc: How did you get here?

AR: Physically, you mean? I flew here, took a taxi, took a shuttle bus. That's how I got here. I also woke up in the morning. (Laughter in the room.) If you want I can go back—where it all started, where I played my first hockey game: West End, Montreal. A place called Montréal Ouest. A place where you could actually have frozen ice rinks—I don't know if you can get those there anymore, they're sort of half-slush now—we used to have really bad winters back then; lots of snow.

cc.cc: What technical systems are operating on us right now?

AR: Well, there are radio waves all over the place, Wi-Fi, different frequencies. There are geomagnetic waves, ones generated by the earth itself, affected by the moon and the sun; I guess those are bigger ones.



There is probably something about this building; it looks like it was built in the 1960s, so it may have something in it, we call it "blue concrete," it has uranium, radon gas. [1] Probably some low level radioactivity. Otherwise, the furniture seems to be pretty old stuff, so all the formaldehyde is gone. These floors were probably laid using solvents, they are not water-based, but by now they are probably dry as well. [2] Relatively good, actually.

cc.cc: It is interesting that you characterise the earth's magnetic field as a technical system.

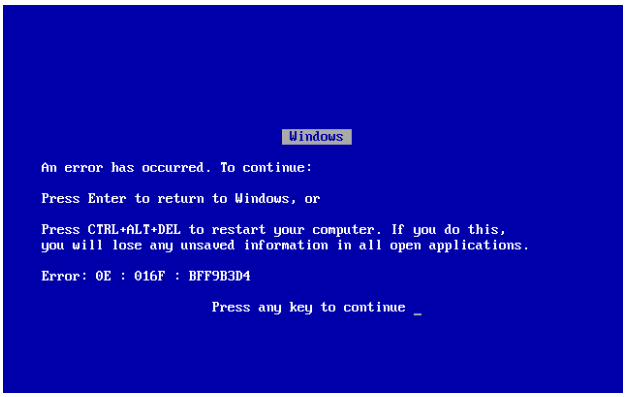
AR: That's my view on it. "Technical," means that you can measure it.

cc.cc: What pieces of the technosphere do you have on you?

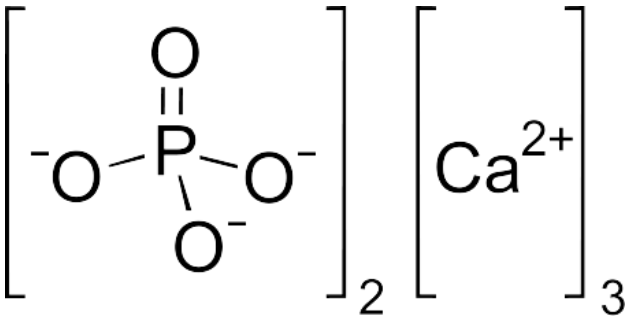
AR: I have computers on either hip, printed money, probably a whole lot of toxins from my exposure to everything—having worked in labs and eaten bad tainted food, all sorts of things like that. Of course, corrective lenses, antiperspirants, things to stop bacteria, lots of interesting stuff in your mouth—mercury, lead. [3] I am a walking bionic, not too much steel—there is a lot of metal in one's mouth...

cc.cc : What part of the technosphere do you rely upon the most?

AR: I haven't really thought about it. When you say technosphere , you are talking about data and trauma around technology and phosphorus. It is probably even-steven for all three of us in this room. Sitting on a bike, traumatized by evil taxi drivers in downtown Stockholm where I ride my bike everyday…. Upgrading, living with Microsoft, adapting to it, that is a continuous treadmill, that is part of the trauma. We never really understand that relationship, until you finally get a blue screen [4] and a complete disk crash and then you have to renew yourself. Two hours of work, file gone. That is the most empty experience because you have invested in this apparatus, with your mind and talents and everything, and then it is gone, completely gone, you never get it back, you have to start all over. That is really hard to do, to go back into time, that is a big challenge. That trauma is really disconcerting; the guys who wrote the Bible did not have to endure that sort of thing because they used a piece of paper. If you really believe in software and stuff like that, this puts you in a vulnerable situation. This is why young people, I think, are only interested in bite-sized stuff. If it's on Twitter, it's 140 characters, I can probably rewrite that—that's about it.



But back to the phosphorus thing. Most people think milk has got calcium in it—it does, but calcium doesn't exist by itself—what is actually important is calcium phosphate. Your mother said, "Drink milk because of the calcium." No. She should have said, "Drink milk because of the calcium phosphate." Then the whole world would be different because we would know what is in our bones, what is in our cells. We do not have much knowledge about the other part of the compound, the calcium compound. That will traumatize a whole lot of people who will live in countries where food costs more than housing, sooner or later. We are very dependent on artificial fertilizers, so we are dependent on finite resources from mining, the phosphorus challenge is not recognized by most governments—certainly not the UN or the average person—so, there is widespread ignorance about it. This is not good.



Chemical structure of tricalcium phosphate

The smokescreen of energy, and carbon, and fossil fuels distracts from the phosphorus problem—it is not just the average person, but also the research and policy communities that are ignorant. A lot of people do not know what phosphorus is, but it is probably more important than the oil or coal we are burning, since there is no substitute. You have to get three grams of the oxide P2O5 every day, if you do not want to be malnourished. There are about 1 billion people already on that list, there will be a population of 9 billion in 35 years, at which point there may be another billion malnourished, who are not getting enough food. Food is not just carbohydrates, that is the thing. So, our dependence on these minerals—this should be something that comes out of the technosphere research project, as well as governance around those limited resources. [5]

Phosphorus: An Apparatus Of The technosphere, Act III Arno Rosemarin's Presentation at HKW, 2015, Sep 30–Oct 04

cc.cc: What is the technosphere ?

AR: It is the play between humans and the planet. It is what we have done to the planet as well as our take on nature—the natural systems around us. It is a sphere , meaning all-encompassing, and techno is our view on it. Unfortunately, we think we are the masters of that system, that our efforts are true and solemn, but I think we trick ourselves. We think that we control through our technologies, until disasters arise. We still call them natural disasters but they are not actually natural. They are a play between nature and ourselves, but we do not seem to learn this lesson. So, the technosphere research project is half a learning forum, and it is incomplete because of the human situation, our take on nature and how we want to manipulate it.

cc.cc: Please pick one image that resonates with your idea of the technosphere. [6]

AR: The refrigerator. It is about survivorship. It is about hoarding, selfishness, a high amount of dependence on technology, packaging. It is very far away from the ecosystem that is providing food. There are three things that humans do: they build buildings, they move around, they eat. They have to get food somehow. [7]

cc.cc Notes

[1] EDITORS' NOTE: "Because of the geological conditions with an abundance of granites and pegmatites rich in uranium and thorium together with large areas of uranium-rich alum shale, exposure from natural radiation is not unusual in certain types of industries and other work activities in Sweden. [...] Lightweight concrete [often called 'blue concrete' given its bluish colour] produced from uranium-rich alum shale was in use between 1929 and 1975. Almost 400,000 dwellings, 10 percent of the building stock, contain this material." (Lars Mjoenes and Gustav Aakerblom. " Workplaces With Elevated Levels of Exposure to Natural Radiation: The Situation in Sweden." Draft of paper presented at the IAEA Technical Committee Meeting Assessment of Occupational Protection Conditions in Workplaces with High Levels of Exposure to Natural Radiation, Vienna, May, 2001.)

[2] EDITORS' NOTE: "Formaldehyde is a common chemical used in many industrial and household products as an adhesive, bonding agent or preservative. It is classified as a volatile organic compound. The term volatile means that, at room temperature, formaldehyde will vaporize, or become a gas. Products made with formaldehyde tend to release this gas into the air. If breathed in large quantities, it may cause health problems." (Eric Lipton and Rachel Abrams. " The Uphill Battle to Better Regulate Formaldehyde." New York Times May 4, 2015.)

[3] EDITORS' NOTE: "Approximately half of a dental amalgam filling is liquid mercury and the other half is a powdered alloy of silver, tin, and copper. Mercury is used to bind the alloy particles together into a strong, durable, and solid filling. Mercury's unique properties (it is a liquid at room temperature and that bonds well with the alloy powder) make it an important component of dental amalgam that contributes to its durability." US Food & Drug Administration's " About Dental Amalgam Fillings. " 2015.

[4] EDITORS' NOTE: "Blue Screen of Death (also known as a blue screen or BSoD) is an error screen displayed on a Windows computer system after a fatal system error, also known as a system crash: when the operating system reaches a condition where it can no longer operate safely." *Wikipedia*. " Blue Screen of Death."

[5] EDITORS' NOTE: The Phoenix Phosphorus Declaration, a consensus statement issued at the 2011 Sustainable Phosphorus Summit, states, "Mining of phosphorus for fertilizer production has massively altered the cycling of phosphorus on Earth," and while this has greatly expanded food production capacity across the globe, "By closing the human phosphorus cycle and transforming wastes into resources and uncertainty into security, humanity can implement a 'new alchemy' in which people become more secure and enjoy greater well-being in a healthy environment."

[6] EDITORS' NOTE: During the discussions, interviewees were asked to pick from a set of somewhat random images. This collection of different phenomena served as a prompt for thought on the forms of appearance and the visuality of the technosphere. You can view the set here: www.flickr.com/photos/57221817@N07/25411316686/in/photostream. The discussion here refers to www.flickr.com/photos/57221817@N07/25411001356.

[7] EDITORS' NOTE: It is estimated by the Center for Urban Education about Sustainable Agriculture that the average U.S. meal travels about 1500 miles to get from farm to plate.