

Comments by students on the game “Bioerror or Bioterror?”
Presented at the Workshop Worldviews and Values in Synthetic Biology

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Paris, Sorbonne, June 6, 2014

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In the frame of a multidisciplinary research, epistemological explorations are more than useful. They are crucial component for the success of multidisciplinary research projects. As future engineers or scientists, it appears also essential to be able to build a personal reflection on and between the disciplines we will practice. For this, the role play is particularly adapted to “think outside the box”. Indeed, forcing himself to change his point of view on the situation allows to directly consider issues that would not even exist in our referential, but also to indirectly sprout reflexions on h.er.is relative position in the system through the process of trying to inhabit a new personality. Furthermore, playing the scenario and characters written by others also increases the possibility of meeting new considerations.

The scenario we were supposed to play was focused on the notions of “bio-safety”, “bio-security” and the associated ethical issues. Actually, we didn’t speak a lot about the ethical/moral/religious aspects coming with such a hypothetical event as the one proposed in the scenario. It appears that those aspects are not the ones coming to our minds during the game. This may be due to the “crisis” and the lack of precise culprit. But most of all, we were quickly concerned about the level of reality of the events proposed. Indeed, the positive feedback created by the thought process of putting himself in an imaginary situation may become negative if the situation is mostly unlikely. In our case, the proposition of applying semantic containment to humans, creating new types of organism functioning on AXN and not ADN anymore, in order to save humanity from a synthetic bug, belongs to dystopian science-fiction in the first sense. First, it is not scientifically credible. Recent progress in integrative biology for instance show the complexity of biological systems that appear less and less possible to be intrinsically modified. And the “things” that we can hope to create in synthetic biology and confine that way are so simple that they can even not be qualified of living. But it is not ethically credible either, as it is the case for most of science-fiction novels (see *1984* in which technological solutions to rewrite history are not thinkable and in which the situation is not ethically acceptable, or the film *GATTACA* in which it is also the case). Of course it would be a strong way to think different, but we preferred to keep the cognitive dissonance relatively small in order to highlight problems linked to synthetic biology in its current state, since the reflection of today drives the development of disciplines, for which it makes no real sense to anticipate an hypothetical future state. We thought that displaying events in a too far-fetched future make people losing their cognitive as well as their ethical landmarks.

Presenting the way we performed the game by reviewing the extensive discussions we had would be far too long. Here we examine 3 main themes that emerged from our exchanges: information, legal framework, and human/Nature relationships.

The first main theme that emerged from our debates was information. The role playing game brought out this theme really quickly and all the different characters had their own way to interact with it. For instance, John, the theologian wanting to bring the “truth” to maintain the faith, or David, a dad, don’t understand a single thing about synthetic biology but wants

to know the “truth”; Lea, the member of the Parliament who want to bring out the “truth” to calm down her citizens during this crisis. The debate showed that if all of them spoke about the “truth”, each of them was speaking about a different thing. All those “truths” had different goals and were not THE truth. Each of them had different operating logic guiding its thoughts. For instance, Stefan, the scientist from a private lab, was trying not to give too much information to other labs without hiding everything either. Similarly, when the theologian spoke of truth to convince people to trust God, or the MP asked her citizens (and electors!) to trust her, etc. Information is more and more important with such a complex set of actors.

So, the issue of information appeared during the game with several questions: what level of knowledge should be broadcast? To who? To everyone or to an agency of control? What can we tell the citizens to inform them about the precise development of a complex research without causing panic amongst them? Another aspect of the information was open data. We had an interesting exchange about the level of sharing and the extent of such a system. During the debate, while everybody agreed with enforcing open-data, two issues appeared. The first is: what information should they broadcast in order to keep a competitive economic system? Indeed, competition is needed to stimulate the economy. And the second is: who’s first? The scientist feared to be the only one uploading data and so lose economic efficiency. Moreover, when the bioterrorist attack was considered, open data became a threat: everybody would know what labs have done and so the protocols should be protected to prevent everybody to be able to do synthetic biology in its garage. The MP character first concluded that we should communicate more and explain with simpler words the potential risks. One objected, however, that communicating only on the risks would create a fear phenomenon. But, after all, is the information the most important thing people need during a crisis? In this situation, this question may be really important to explain what happened to the citizen and calm them down.

Then, one recurring issue was the question of ethical and legal control, governance, and the role of institutions. Because of its technoscientific nature, in the sense that the discipline is closely intertwined with technical developments, projects in synthetic biology necessarily involve stakeholders with divergent interests, as (to caricature it) the opposition between pharmaceutical companies and public institutions. The legal frame is elaborated by politics with the help of specialists, but without the possible implication of lobbies. During the game, the debate between the deputy and the lab director, moderated by the thoughts of the philosopher, showed that too restricting laws were not necessarily a benefit for society, as economical gains coming from scientific progresses may have a great impact. But the boundary is foggy and easy to cross: one should think of the trade-off between private profit and public benefits, which position may be very sensitive to many characteristics of the socio-economic system and may be easily played on at the advantage of private interests. In such a crisis, shall we totally restrict the work of private labs, or on the contrary let them totally free so they find a solution more quickly? How to manage in an optimal way the cooperation between academics and private companies? And these views can be entirely contested when taking the place of the religious person for who moral is the most important and for who “playing god” is not acceptable: although it is impossible to define an absolute moral, people are always there in the middle of political and economical interests, so what happens when one follows the lain principle of “people first” ?

The question of level of governance appeared also as crucial in our debates. Global institutions that can impose international regulations may be desirable for that kind of issues, in order to avoid local exceptions that would allow to go beyond laws of other countries. But as it was pointed out by the character of the citizen, such global regulations can in some cases not adapt to local culture or practices and create dissonances that hurt more society than it benefits it. Maybe we could explore towards new ways of governance, as participative platforms that would allow a bottom-up regulation of the system. That is maybe what is already existing with Open Source collaborative projects, as the result is the

emergence of individual interactions and collaborations, and not a top-down driven project. Can a totally collaborative platform allowed by new Its be the basis of a “real” democracy in the sense of providing a real decision power to the citizens? These issues are not specific to synthetic biology, but they are of dramatic importance for an ethics of the scientific discipline.

We end with the last theme: relations human/Nature. It is interesting to come back to the first minutes of the game. While we were all presenting our characters, every one described a relation to synthetic biology, from David’s son inspired from a speech from the scientist George to the theologian John worried about the creations of God, without forgetting the MP from the ecologist group, who wants people to see Nature as a friend. Those different relationships to Nature lead us to those different thoughts.

First of all, ecology is now “à la mode”. But to which extent do we really care about it? In our game, it was interesting to observe that as soon as we spoke about human beings, other living forms became uninteresting. We debated more about economic impacts than about the environmental impacts on natural equilibrium and biodiversity. Even if we are thinking more and more with the “network” or “system” metaphor (“social network”, “data in clouds”, “systems approach” of a “smart city”, etc), we are still unable to think about other living forms than us in emotionless, neutral terms. We are still speaking of “friends” or “enemies” with war metaphors (such as the evolutionary “arms race” in biology).

The second thought we had about relations human/Nature is related to the notion of “natural/unnatural” or even “against Nature”. In fact, we didn’t even wonder whether the bacteria could be said “natural”. We certainly could, but because of the emergency of the situation we omitted this aspect. Actually, the interesting point is that the fear and the crisis was linked to the fact that the bacteria was created by humans. As if we were less confident with human creations than ones done by Nature. Nature can surely be dangerous, toxic, or destructive, but it seems that we fear more the responsibility coming with the creations. During the debate, it appears that it was a human error, and that’s the point. The fear came from thinking about what human being could do with such a power, be it playing God or playing Legobricks, without thinking about the potential repercussions. At the end, when we spoke about bioterrorism, it was clear that we fear more the errors of humans than the error of Nature.



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