

# Do-It-Yourself biology as Jacques Rancière's Icaria

## New territories based on equality to research in biotechnology

Pulse: A History, Sociology  
& Philosophy of Science  
Journal, 2016, Issue 4

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### Abstract

Do-It-Yourself biology, or DIYbio, is a contemporary movement that makes claims of equality in its practice of scientific research. The people that join DIYbio are hacking biotechnology in the same way that hackers use information technology. These biohackers are spread world-wide in community laboratories that work similarly to squats. In this article, we explore the identity of this movement and how it is related on the one hand to institutional biotechnology research, and, on the other hand, to open source culture. On equality, we follow the thinking of the eminent French thinker Jacques Rancière. The claims put forward by DIYbio work as a re-enactment of a community of equals as described by Rancière. Moreover, a parallelism can be made with the Icaria settlement in the end of the XIX century, which tried to relive Marx's egalitarian vision. Equality gains substance and makes sense through events of community affirmation. Another lesson, taken from Icaria by Rancière, works as a warning to the biohackers: to claim equality in the unequal world of work can come to make the movement subdued by capitalism.

**Keywords:** Do-it-Yourself biology; Jacques Rancière; community of equals; equality; Icaria.

### Biohackers, taking Labs into communities

Rob Carlson was once a senior researcher at Washington University. He had worked closely with the first synthetic biologists, who sought to simplify molecular biology by

treating it as an engineering discipline. He aimed to develop a protein-tagging system, but wasn't into institutional research anymore. Could he take the matters into his own hands? Did it sound crazy? The most basic laboratory equipment is extremely expensive, that's a huge obstacle: or is it? In 2005, Rob found out that old laboratory equipment was getting easier to find online, even on e-bay. To work with genetics, like he did, he would need some hardware and software, but that was getting cheaper as well. That, and you could always up-cycle, to cannibalize some old equipment and computers that were once abandoned by public research and could now find a new life in a cozy private space. Rob announced his discovery to the world in an article in *Wired* magazine: anyone could build up a laboratory in a small garage (Carlson, 2005). He built his own that same year. That was just the start. Today there are community labs, as the Parisian La Paillasse, establishing new territories in science research (La Paillasse, 2015).

The 2005 media coverage of the home laboratory of Dr. Carlson had an immediate consequence. The first group laboratories came to be with many new biohackers joining. DIYbio became a global movement, spreading the use of biotechnology beyond traditional academic and industrial institutions. It started to take shape in 2000, but it was in 2005 in a report published in *Nature Biotechnology* that its reputation started to build, and through an article at *Wired* that it started to become notorious (Grushkin *et al.*, 2013, p. 9). DIYbio had evolved to include approximately 3300, according to the number of online DIYbio message board members (*idem*, 8). People who were originally doing kitchen or garage experiments began organizing and setting up labs in commercial spaces. Most of these volunteers and entrepreneurs are young and north-American. Yet, the official map of DIYbio spots biohackers also along Europe, Syria and New Zealand (*idem*; Landrain, 2014). Some of those people pooled resources to buy, or take donations, of equipment and began the group labs, also known as “community labs” that sustain themselves through volunteers and membership donations. Paid classes have a role also, with lessons in synthetic biology, neuroscience, bio art, genetics, and basic biotechnology (Grushkin *et al.*, 2013, 5). According to the research done by the *Synthetic Biology Project* of the *Wilson Center*, most of the DIYbio laboratories were performing mostly basic bio-technological operations, as happens in any University, from 2011 - 2013 (*idem*, p. 12). Still, when following the practices of these biohackers, we realize that the nature of the majority is distinct from the institutional student-researcher, and far from the bioterrorist. DIYbio practitioners are a mix of amateurs, enthusiasts, students, and trained scientists.

Most of the biohackers work in multiple spaces and there's a diversity of backgrounds (*idem*, p. 7). Each biohacking facility has its own identity. The first community labs opened up in the USA: in Brooklyn, New York, and in Sunnyvale, California. La Paillasse is one of the most recent, having been formed in 2012 in the outskirts of Paris, then moved in September 2014 out of the suburbs and into the city center, to the deuxième arrondissement of the city (Cheshire, 2014). According to Thomas Landrain, founder and president of La Paillasse, these are new 750 m<sup>2</sup> “of pure

freedom” (Landrain, 2014, video at 9 minutes). It all began with Landrain going enthusiastically inside a hackerspace. Once he got there he built the first iteration of La Paillasse, finding old equipment in University Laboratories (Cheshire, 2014).

This *biochiner*, antiquing, is exactly the mark of the innovation of La Paillasse, according to Landrain, and is one of the greatest strengths of the Do-It-Yourself biology movement (Landrain, 2014; Grushkin *et al.*, 2013, p. 12). DIYers have succeeded in producing inexpensive alternatives to expensive biotechnology equipment. Everyday equipment expected to be found in a lab, such as a professional Polymerase Chain Reaction machine, a lab staple used to amplify DNA (meaning to make more copies of the same genetic material) can cost more than \$2,000. DIYers developed their own kit version that only costs \$600 and are openly giving the schematics online (Grushkin *et al.*, 2013, p. 11). The same logic applies to other lab equipment, as the gene gun showed on Figure 1.



**Figure 1.** A gene gun, or a biolistic particle delivery system, originally designed for plant transformation, is a device for injecting cells with genetic information. This technique was developed as an alternative to other, more traditional, genetic material transfection methods. The technique fires microparticles that insert the desoxy (or rybo)-nucleic-acid into the target cells. The Helios® Bio-Rad gene gun, shown on the left, is one of the most popular choices in biotechnology laboratories using bioballistics. The one on the right is also a gene gun hacked by Rüdiger Trojok, a biohacker. As the Bio-Rad solution is integrated into scientific research technological problem solving (e.g. O'Brien, Holt *et al.*, 2001; O'Brien, Lummis, 2011), Rüdiger's hacking is presented as an effective way to have access to this technology, so as to perform a basic transfection into onion cells. The hacked gene gun, shared without peer-review with other biohackers can be built spending 50 EUR, while the professional one from Bio-rad can be sold for up to 15,000 EUR (Trojok, 2012).

Affronting the academic culture, Landrain asks “Why should one wait to get a PhD? Why should one wait to get one million USD in his bank account to set up a lab to experiment his own ideas?” (Landrain, 2014, video at 4 m). La Paillasse materialized from a need, namely that of looking for solutions for “zero euro laboratories” (*idem*, at 5m55s).

## In-between academic research and open-source culture

DIYbio is deeply influenced by open-source culture, in comparison with 'formal' academic research. Open-source is a concept emerging from software development, consisting in the collective effort of individuals towards a common goal in a more-or-less informal and loosely structured way. Most of those individuals are working in their free time and no single entity owns the end product, free of charge, to be used. The most famous examples of open source software include the GNU/Linux operating system, the Apache web server, Perl and BIND (Benkler, Nissenbaum, 2006, p. 395). Some characteristics of the DIYbio movement allow us to see its proximity to the open source culture, and this distinguishes it from the more normative science research:

- Firstly, the antiquing and up-cycling culture is common to both DIYbio and open source technology;
- Secondly, in contrast with academic culture, the communication of results is also done differently, as rather than wait for some peer-reviewed publication, members are more likely to emblazon their accomplishments on the Internet (Grushkin *et al.*, 2013, p. 8). We see this contrast in DIYbio and other participative approaches, particularly in relation to institutional science research. Just like open source developers, DIYbio shows the same trend of moving away from copyrighted software developing.
- Thirdly, the cooperative action that arises in the community labs inherits the unbounded movement of the wills of individuals. In a squat house anyone might come in at any minute. From this, the interdisciplinary character of the biohackers' labs is a fruitful consequence, which academic labs are not able to achieve, says Landrain. In La Paillasse, the seemingly aleatory cooperation between designers and biologists has come to light, through the development of different products (La Paillasse, 2015). According to Landrain's statements, "You can work with anyone and you can address those problems that you cannot deal with by yourself. Academic labs aren't prepared for this kind of permeability between labs and disciplines, this is making innovation slower" (Landrain, 2014, video 22m). In this sharing space, while most DIYers are still learning the essentials of biotechnology, many already have expertise in electronics and access to rapid prototyping tools like 3D printers and laser cutters (Grushkin *et al.*, 2013, p. 11).

An example of this interdisciplinary permeability, Sarah Choukah says that her membership to the biohacking community Bricobio in Montreal, Quebec, allows "being playful with concepts and tools we would otherwise take for granted or don't know enough about" (La Paillasse, 2015). Other community labs, as Bricobio, reach out to the lay public and students with hands-on training and education that would otherwise be

available only to university students, and those in industry (Grushkin *et al.*, 2013, 8). Inside these spaces, the social interplay is more informal, and allows the participant more easily to tinker, to play around with an object and 'glass-box' it. The focus of the efforts on using the technology can be diverse, as to create art, or to explore genes and proteins.

Hence, DIYbio is strongly marked by the desire to have more democratic access to knowledge than in formal learning tracts (Landrain, 2014, video at 3m50). Nevertheless, Thomas Landrain himself is involved in the market industry with some of the outputs from this interplay at La Paillasse. The first pen fed by bacteria, having a much smaller impact in the environment than the traditional ink pen, is the first product of a new start-up company named Pili, which partners the biologist Landrain with a designer and an entrepreneur (Yin, 2016).

The Parisian DIY-bio La Paillasse is one with a strong egalitarian message, and is developing products with both an ethical and moral perspective. Of course, these aren't entirely for free and aren't set aside from the market economy. In contrast, the open source technology develops zero-euro solutions for users. Evidently, the DIY-bio movement brings biotechnology closer to home than the academic culture, but it becomes pertinent to get to grips with its identity.

## **Do-It-Yourself biology, tracking lines of identity**

DIYbio can be thought of as the coming together of a *community based on equality*, specifically in its active affirmation of social egalitarian principles. Inside this movement there is no single voice that can speak on behalf of the others. In spite of the strong care given to safety that is shared among biohackers, there is no way to know what every member is doing at any given time (Grushkin *et al.* 2013, p. 8). In agreement, according to Landrain, “the mind-framework at La Paillasse is that you know you can do whatever you want, wherever you want and whenever you want” (Landrain, 2014, video at 22m10s).

As a broad and decentralized movement, DIYbio is close to its contemporary Occupy movement, which started out from 2011 by reclaiming the public space for equality of rights against the global market. Manfred Steger and Paul James see Occupy as a type of “justice globalism”, generating worldwide protests against inequality and uneven distribution of wealth (Steger, James, 2013). Its social organization is characterized as a grass roots movement, decisions starting at the base, just as DIYbio has similarly affirmed itself to be. With La Paillasse originating in a squat, DIYbio also shares this political motivation as denouncers of a corrupted system (Pruijt, 2013). Testimonials of DIYers also address their critical awareness towards the state and economical market (La Paillasse, 2015).

Yet, economical innovation is, paradoxically, one of the aims of the movement. Ideas and products emerging from DIYers already present several academic and industrial applications. For example, the products developed include: inexpensive

biotech equipment, and diagnostic tests for the developing world (Grushkin *et al.*, 2013, p. 8), the aforementioned pen that lasts longer and has been produced independently by the start-up Pili, and the development of biodegradable fabrics (Yin, 2016; Landrain, 2014). The aspirations of DIYbio are bold, as “DIYbio can inspire a generation of bioengineers to discover new medicines, customize crops to feed the world’s exploding population, harness microbes to sequester carbon, solve the energy crisis, or even grow our next building materials” (Grushkin *et al.*, 2013, p. 4). The movement shows a strong humanitarian-ecological ethos and integration into the economic market.

Also, in terms of biosafety, all community labs have security rules, and overall they are getting more integrated into laboratories' formal administration's demands (Grushkin *et al.*, 2013, p. 9). For example, in the USA the access and protocols for the use of DIY bio laboratories have been strict. The movement has been acting on its security measures in cooperation with the Federal Bureau of Investigation, since 2011 (*idem*, 18). For all these reasons, DIYbio doesn't seem more prone to irresponsibility or bioterrorism. Since the first reports of Carlson's new home laboratory, the media had overtly speculated about the offspring of bioterrorist cells. Just like with other movements of “justice globalism”, there was an immediate mediatization of fear that has been diluted in the following years.

La Paillasse communitarian research center was itself a squat “where you could get all your equipment for free” (Landrain, 2014, video at 6m). Many squats have been social centers, give-away shops, or pirate radios (Pruijt, 2013). As mentioned, the squat that gave origin to the Parisian community laboratory was also a hackerspace, a space where people cooperate in understanding and building up their hardware and software. A good part of this cooperation that happens online for the development and management of open source technology is also physically taking place in such hackerspaces. The DIYbio network shares this up-cycling culture, as the idle instruments of academic research are restored and reused in this continuous search for inexpensive and ecologically viable alternatives.

One of the lines of identity in DIYbio was claimed through open source culture. Many DIYers affirm themselves as hackers, that the biotechnology appropriation they propose is parallel with the first hackers in the 1970's, who created personal computers (Landrain 2014). From the hackers movement, a whole set of digital tools has been developed, framed by open source technology. The licensing of these products falls under the GNU General Public License model, now on its third version since 2007, and allows the free sharing and editing of the works done (unlike commercial models). The most famous examples of these intellectual licenses are the *Linux operating system* and the *Wikipedia Free Encyclopedia*. Altogether, this alternative socio-economic system of production is described as Commons-based Peer Production. The commons enterprise, besides avoiding market pricing, also applies coordination without managerial hierarchies. Some authors make evident how this approach fosters important moral and political virtues (Benkler, Nissenbaum, 2006).

Taking things a step further, some members of DIYbio together with other citizens, took the legacy of the commons into the biosciences. Can discoveries, technologies, and products be considered politically as common goods? From a discussion held in Helsinki, in June 2014, the concept of Bio-Commons was settled. Not only DIYbio members were involved. Together with others they identified the requirements and conditions of Open-Source and Citizen-Science concepts in order to realize Responsible Research and Innovation (RRI) in the Life Sciences (Trojok, 2014). The political frame for the action of DIYbio became, in this way, far more substantial.

As inclusive spaces prone to experimentation and error, community laboratories are open to people for exploring aesthetic value, producing art. Others were longing for a space to do with genes what amateur astronomers were doing with the night sky. The biology was “too important to be left over in the hands of professionals” (Landrain, 2014, video at 3m50s), as if the formal science research was in need of democracy.

## **On the route for equality**

Much of the identity of DIYbio appears to be rooted in the political affirmation of equality through the words of Thomas Landrain. Biotechnology was taken out of formal laboratories and into the fold of hackerspaces, thus asserted into a political position of global justice. The statements taken by Landrain are also connected to the community lab that Landrain integrates, La Paillasse, which opened its doors in September of 2014, in a new wider space in Paris. His arguments on equality, though, go beyond the walls of the community space in the middle of the French capital, and they define the DIYbio movement. In this frame, DIYbio can be represented as a re-enactment, a re-invention of a *Community of Equals* (Rancière, 1995). The concept was coined by Jacques Rancière, a contemporary thinker, who has been described as having a fundamental message, namely the democratization of knowledge (Nordmann, 2007 in Pelletier, 2009, p. 13). According to Rancière, democracy can be defined as the space for egalitarian practice in the making (Rancière, 1995, p. 90). A concept such as the community of equals can be inscribed in these events of coming together. Nonetheless, to reach equality is both a political and a philosophical problem, which can be appreciated through reflecting with Rancière.

Jacques Rancière is Emeritus Professor of Philosophy, at the University of Paris VIII (St. Denis). He has a wide array of experience in different fields of study, from politics to aesthetics, and education. According to Kristin Ross, we can identify two moments in Rancière's work: an archival, and another, critical, phase. The archival phase, including his research of the XIX century workers and dynamics, is characterized by an eruption of negativity of *thinking* into a social category, always defined by the positivity of *doing*. Such groundwork nourishes a critique of the claims of bourgeois observers and intellectuals (Ross, 1991, p. xviii). In the axis of these reflections are the concepts of *equality* and *emancipation*.

## After May 1968 with Jacques Rancière

The student demonstrations of May' 1968 had students taking over public spaces, and implementing other decision-making methods. This was done in the university as with workers who strike in a factory. For some, it represented the inauguration of a new politics that related knowledge to power (idem, p. xvi-xvii), that consequently energized transformations in the following years. Hopes for social change dissipated: the 1970's favored above all the sociological reflection itself.

After May of 1968, *reproduction* and *distinction* became popular concepts with the new sociology of Pierre Bourdieu. The reproduction and distinction of social inequality didn't have a considerable impact to sociologists, but it did transform the practice of historians, anthropologists, and pedagogues (idem, p. x). With such a critique of social dominance, traditional schooling was discredited. The science that Bourdieu builds maintains a critical attitude towards social arrangements, whilst keeping the sociologist in the role of denouncer. In the words of the editors of 1984's *L'Empire du sociologue* this discourse is fitting for a time that combines the “orphaned fervour of denouncing the system with the disenchanting certitude of its perpetuity” (ibidem).

The new sociologist, as designed by Bourdieu, could unveil the relations of dominance hidden from other social actors. Rancière formulates the logic of Bourdieu's argument with two propositions (Rancière, 1984, p. 28):

1. The working class are excluded from university because they do not understand the real reasons for which they are excluded (from *Les Héritiers*, Bourdieu, 1964)
2. The misrecognition of the real reasons for which they are excluded is a structural effect produced by the very system from which they are excluded (from *La Reproduction*, Bourdieu, 1970).

The “Bourdieu effect” could be summed up in this perfect circle, a tautology. As Rancière explains, the workers are excluded because they don't know why; and they don't know why they are excluded because they are excluded. From this perspective, Bourdieu's analysis of the division of knowledge between social groups appears as an explanation of inequality.

Still, Pierre Bourdieu's sociology of education was actually related to a practice, implemented to the renewal of French education. Bourdieu supported a reform of educational institutions starting from social relations, thus formalizing a compensatory attitude to unequal opportunity. On the other side of this equation was Jean-Claude Milner, with republican teachings and equality by the diffusion of knowledge. The aim of education at school should be “instruction”, transmitting knowledge, not “educating” (Ross 1991, xiv). Bourdieu's approaches to education that were undertaken meant for Milner a sacrifice of true scholarly research (idem, p. xiii, xiv). The focus on “instruction” referred back to the public, mandatory, secular laws on education passed



by the republican Jules Ferry at the end of the nineteenth century. As shown, Rancière didn't agree with Bourdieu's vision and neither did he go along with this alternative of a pure, scientific transmission (idem, p. xv).

In spite of their diverging viewpoints, Rancière was together with Milner, who was part of the young theorists of the "cercle d'Ulm", the *Union des Etudiants Communistes*. Just on the other side of the river from the biohackers at La Paillasse, these young students attended classes at the *Ecole Normale Supérieure*, in the 5<sup>ème</sup> arrondissement of Paris. There, the Marxist Louis Althusser gave them early seminars on Marx.

Rancière, through his 1974 *La Leçon d'Althusser* examined the political core of althusserian philosophy, the communist opposition between science and ideology, in light of the post-1968 developments and the revolutionary tradition (ibidem). More and more, Rancière gained distance from the Marxist tradition and recognized the capitalist domination taking place. According to his interpretation, the protests of May 1968 were also giving to capitalism the means to regenerate itself, especially after the oil crisis of 1973 (Rancière, 2008, p. 53). The subversive logic of contemporary capitalism, he accuses, subsumes all wishes of autonomy and creativity (idem, p. 53).

James and Steger are clear in stating that alter-globalization movements, such as the Occupy movement, work often within many of the same subjective frameworks and precepts as the market-globalist world that they criticize (James, Steger, 2013). In agreement, Rancière included in his *Emancipated Spectator*, a 2005 piece of art by Josephine Meckseper (Rancière, 2008, p. 41), that is reproduced in Figure 2. In the second plane of Josephine's photography, an anti-war protest occurs while in the forefront a full bin of trash overflows. Terrorism and consumption, protest and spectacle, are re-directed to a same and only process. This is also an affirmation of equality, the market rule of equivalence (Rancière, 2008, p. 45). According to Rancière, Marx "is now lodged at the heart of the system as a ventriloquist' voice. He has become the infamous specter or the infamous father who testifies to the shared infamy of the children of Marx and Coca-Cola." (idem, p. 50). It's more than a disapproval of the demonstrators that the photography of Meckseper attests. The power of domination has assimilated Marxism.

The failure of finding alternatives to neoliberal globalization makes us guilty. In an earlier work, Rancière places here, in the same identity line; the 1986 French students' upheavals against the more 'selective' public university (Rancière, 1995, p. 91). "Participation", "innovation", "citizenship for projects" are all integrated into the lexicon of the dominant power. Still, the critical reflection of Rancière isn't debouching in a dead end. How to overcome the market domination?



**Figure 2.** Josephine Meckseper's untitled. The work is part of a series of photographs of street protests taken after the announcement of the invasion of Iraq in 2003. It was shown in one of the main cultural venues of the second biennial of contemporary art in Seville, in 2006. Juxtaposing in the same frame the protests against the war and the consumerism of the same crowd, this art piece gives a clear insight. According to Ranci re's own words Josephine's work "tries to show protest culture as a form of youth fashion" (Carnevale, Kelsey, 2007, p. 259).

## From Icaria to Community Labs, Equality on the making

In the middle nineteenth century, the French communist movement was dying down. Still, the visionary egalitarian dream of Marx was re-enacted with the Icaria settling. Étienne Cabet, or father Cabet as he was called, lead his followers to the USA where he established a number of communes from 1848, through 1898 (Rancière, 1995, p. 78). Following Rancière it becomes clear that the concept of equality lives through these moments, as it makes clear sense in such processes.

The (re-)invention of the *community of equals*, according to Rancière: (i) is part of the random interplay between what is there and what forces change; (ii) is fundamentally part of a process of sharing; (iii) refers to an earlier coming together of egalitarian event and egalitarian text (Rancière, 1995, p. 90).

If we take Rancière's egalitarian signifier to the heart of the DIYbio message, many parallels can be drawn. From Rob Carlson's initial step, grounding a laboratory in his garage and finding a new use for old lab equipment, community labs spread around the world. This practice seems to rise above Bourdieu's disenchanting tautology while, at the same time, doesn't carry out Milner's view on education as top-down instruction. The spaces where biohackers exercise are designed as based on social inclusion, and, in contrast to formal laboratories, with a vigorous political base of equality.

But where is the egalitarian text that defines the DIYbio community? In Rancière's definition we find the need for such a text, just like Icaria had Marx's words to re-invent a community of equals. For DIYbio, the *Bio-Commons Whitepaper*, released at the end of 2014 takes, in part, such a role. The paper is signed by Rüdiger Trojok, who was involved in the building of a citizen science biolab in Berlin (Trojok, 2014). Still, this paper claims to be the result of a meeting of individuals, not only DIYbio members, but also participants in an open meeting in Helsinki. They present themselves as *citizens*. It's easily understood that this mantle of citizenship is one closer to the republican model, as defined from Aristotle to Jean-Jacques Rousseau, than to a liberal conception. A liberal account of citizenship focuses on the legal status of the citizen, alongside the freedom to make private associations and attachments. Rüdiger and the other individuals meeting in Helsinki claimed their roles as citizens through their political agency, using their own processes of deliberation and decision-making (Leydet, 2014).

Starting out from a concrete problem, a public health issue, DIYbio forges an egalitarian text. The need to develop new antibiotics, stemming from the challenges to human health posed by multi-resistant bacteria, recruits their involvement. They state that not only air, earth, water, but also “discoveries, inventions and man-made creations such as genetic codes, algorithms, novel metabolic pathways and molecular processes designed for and realized in biological media and even entire organisms can be considered as natural goods” (Trojok, 2014, p. 5). The aim of the Bio-Commons Whitepaper is, therefore, to envision a strategy to import the commons concept into life sciences. This can be considered as an innovation for a new Bio-Economy. Biological

codes and concepts would be protected in the same measure as software, and all the related products and physical processes would be protected (Sauter *et al.*, 2015, p. 245).

The fundamental text of DIYbio establishes the Bio-Commons license as a way to stabilize global collaborations, overcome the over-exploitation of common goods and the failure of the Economical Market. Ethically, it is established as a tool to protect and manage any type of biological knowledge in order to curtail possible misuse (Trojok, 2014, p. 21). In other words, it tries to establish a dividing line between salable and non-salable nature (Sauter, Arnold *et al.*, 2015, p. 243). Despite the fierce claim of equality coming from DIYbio, there are actors in the movement dealing directly with money and an uneven distribution of goods.

## Brooding within equality

In 1984 Jacques Rancière gave a lecture with Alain Badiou that further developed his reading of claims for equality and the communist tradition. The Community of Equals is based on this experience, published in *Aux bords du politique* in 1990 (English version – Rancière, 1995).

As a starting point, Rancière affirms two kinds of brooding in the becoming of the community of equals (Rancière, 1995, 63). On one side, a “grudging relief”, as individual will and reason is menaced by the social leveling of the “great whole”. On the opposite side, a “reasonable” nostalgia, described as a virtue of generosity of “being together”, characteristic of politics.

The representation of socialist and communist *ardour* is connected to the foundational works on 'utopian socialism' by Pierre Leroux (*idem*, p. 65). His 1838 *De l'Égalité* and 1840 *De l'Humanité*, were adopted by the working class press. A dual origin can be traced via this representation. First, the image of a fraternal meal inspired by the dynamics of old Greek warriors, the Spartan fraternity. Secondly, the words of the Epistle to the Romans: we are all members one of the other, as one body in Christ. A historical reading of the workers' emancipation, places it better in time as a coming to awareness, as a “self-consciousness of democracy”, going against the oligarch values of work as envisioned by the July Monarchy of Louis Philippe I (*idem*, p. 80). It was in this very period that Icaria was settled in the USA by Father Cabet.

In parallel, a democratic vision feeds DIYbio. More than giving access to a hindered technology, the biohacker's community lab creates settings for mediation, criticism, and exploring possible societal consequences for life sciences research (Sauter, Arnold *et al.*, 2015, p. 250). The 'ivory towers' separating practitioners of biotechnology from society seem, in this way, more feasible to crack.

Still, following Rancière's reflection, the Icarian community was torn apart by the unequal distribution of goods and roles (Rancière, 1995, p. 78). All the egalitarian narratives we find with Rancière are fated to fail due to incomprehension of equality.

Rancière's reading of the utopian socialist events places the workers movement as the aforementioned (re)invention of the community of equals. However, just like the

contemporary re-enactments of 1968, it is doomed to fail: “no sooner than its system is instituted than its system of identification collapses: the communist worker is immediately split into toiler and communist, worker and brother” (idem, p. 76). The recurrent split of the communist movement was unavoidable. The founding text given by Leroux, the “Christian formula for equality” is, simultaneously, as expressed by the commentaries of the church Fathers, as said by Gregory of Nazzius, to also be the formula for hierarchy. In other words, the great Christ-like image of the communist body hides the Pauline image of the body of the church (idem, p. 69). Also, the recollection of the Spartan fraternal meal is ill-fated. As Rancière recalls, the Spartan fraternal meals were called *phidities*. From a passage of Aristotle's *Rhetoric*, Diogenes said that Athenians found their *phidities* in taverns. Likewise, in contrast with the Spartan meals, Aristotle's Politics favors Athenians' communal meals, where each one pays an equal share (idem, pp. 66, 67, 69). The “inconvenient discordance” between community and democracy is one that Plato envisioned well, and that many choose to ignore.

In between the Athenian school of freedom and easy living, and the military discipline of Sparta, many “moderns” plotted their visions of more democratic and civilized societies. Such was the case of Jacques Rousseau and Pierre Leroux, envisioning an Athenian Sparta. The foundation of such communities, Rancière tells us, will be fated to a schism. The voyage to Icaria, founded on the same principles as Laroux's socialism, was also split, as if the old Plato was getting his revenge (idem, p. 78). Plato's Republic gives a Community of Guardians, which has as a founding rule that all of what they have of their own is common. The government of lower by higher “ties non-belonging to equality” (idem, p. 73). The community of guardians means, in the first place, the rejection of possession, and affirms this rejection as the first step to equality. The original source of the above-mentioned communitarian miscalculation lies in a singular experience of transgression that in platonic terms means a revolt of *cardinal* against *ordinal* (ibid., p. 87).

As Rancière reviews, true equality, as friendship, contrasts with false equality, as the citizens that claim equality with scales, such as merchants (idem, 73). It represents a classic opposition between geometric and arithmetic equality, one that Plato was well aware of. The communities of labor and this other, of fraternity, have different logics. The social bond has inherent a form of organization based on an inegalitarian logic, while fraternity with its acts of wanting to speak and listening has a deep-rooted logic based on equality (idem, p. 88). According to Rancière, “a community of equals is an insubstantial community of individuals engaged in the ongoing creation of equality. Anything paraded under this banner is either a trick, a school or a military unit” (idem, p. 84).

The brooding of the community of equals is therefore deciphered. Bringing together the two orders of the social and labor amounts to “casting the imaginary veil of the One” over the schism that puts these apart (idem, p. 84). Still, the generosity of “being together” appeals to the true meaning of democracy, as the “space for egalitarian

practice in the making” (idem, p. 91). Equality and community are in a “never-ending settling of accounts” (idem, p. 65), as the community of equals can always be re-invented. Equality is, therefore, a matter of practice that comes to be through specific events. The re-inscription of such an “egalitarian signifier” can happen in reaction to any stimuli, as any apparently insignificant political measure, a word-out-of-place, a badly judged assertion (idem, p. 91). A beast is awakened, an old-Greek *apeiron*, as desire knows no determination and limits.

## Discussion

For the worldwide community of Do-It-Yourself biology (DIYbio), a re-enactment of a community of equals is made (Rancière, 1995, p. 90). As with other denouncements of contemporary justice globalism, the technoscience is denounced as corrupt, the economy of research as elitist. In the DIYbio community laboratories the technology is up-scaled to be more inclusive. The identity of this community is close to the occupy movement, the cyberhackers and the open-source culture, that give references of egalitarian events in the past. Commons-based peer production, an alternative way of facing the economical market by open source technology is adopted in one of DIYbio main texts, namely the *Biocommons white paper*. There has been an inclusive way to approach the commons, devised to include not only “natural goods”, such as air, water, and earth, but also entire organisms, biochemical processes, and other discoveries, and even man-made biological and biochemical concepts (Trojok, 2014). Biotechnology has, then, with DIYbio, a new political and economic vision based on equality.

In the community labs, a random play takes place. In the setting of up-cycled biotechnology equipment, anyone can enter. The political affirmation of equality makes the sharing between the “lab rats” and other people the central point. The global change of such meeting is stated by the DIYbio movement as one of devising new knowledge and new objects to solve global issue that enter the economical market. This is the most critical point following Rancière.

The post-May 1968 revolutionary energies had an impact on Rancière's thought. Many egalitarian signifiers came together in the demonstrations and group works, and yet, with time, were subdued by capitalism. Can the biohackers venture be more than just a new Icaria? Is DIYbio ill-fated because it affirms equality in the unequal world of work? The coming of Plato's revenge might be seen as a warning, as Rancière's narrative might be appreciated without the fatalist tone, but rather with a hopeful overture. To follow the “democratic passion” might put us at crossroads, just like Father Cabet settling Icaria or the biohackers Landrain and Trojok setting political overture inside Biotechnology. Equality, for Rancière, is put at play exactly in these moments, bringing people together to a mutual stand point. It means exactly this possibility of acknowledging the possible roads, and, this way, to be “prepared to be torn in all directions at once” (Rancière, 1995, p. 80).

## Acknowledgements

In the context of this research, I would like to thank Rüdiger Trojok for his cooperation, Andrea Mazzola for first triggering my curiosity on biohacking, Rike Körber for her assistance on moments of dire need and Professor Olga Pombo for her lasting support.

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