



DEPROLETARIANIZING AGRICULTURE

RECOVERING AGRICULTURE FROM AGRIBUSINESS AND THE NEED FOR A COMMONS-BASED, OPEN SOURCE AGRICULTURE

Dr. Pieter LEMMENS

Wageningen University
Centre for Methodical Ethics and Technology Assessment (META)
De Leeuwenborch, building 201
Hollandseweg 1
6706 KN Wageningen
Room: 4038
Tel: 0031(0)317-48102

Abstract

This article deals with the biotechnology revolution in agriculture and analyzes it in terms of Bernard Stiegler's theory of techno-evolution and his thesis that technologies have an intrinsically pharmacological nature, meaning that they can be both supportive and destructive for sociotechnical practices based on them. Technological innovations always first disrupt existing sociotechnical practices, but are subsequently always appropriated by the social system to be turned into a new technical system upon which new sociotechnical practices are based. As constituted and conditioned by a technical system, human cultures are necessarily systems of care. Humans take care of themselves and the world through technologies. Agriculture is a very old system of care, stable for more than 10,000 years, but at the moment it is experiencing a profound rupture thanks to the invention of genetic engineering technologies, that promise to revolutionize it. However, their current deployment under capitalist conditions everywhere leads to processes of proletarianization, due to the fact that they enable the expropriation of farmers of the means of production, depriving them of the possibility of appropriating these new technologies and frustrating the invention of a new agricultural system of care. This has led to a widespread rejection of the new technologies, which is a grave error though, as these technologies can become the basis of a new system of care. But only under the condition that they are wrought from corporate control and redeployed instead to initiate a process of deproletarianization. It is argued that current initiatives in open source and commons-based biotech are probably the most promising harbingers of such a process of deproletarianization.

Key words: agriculture, technical system, biotechnology, capitalism, proletarianization, *pharmakon*, open source, commons

1. INTRODUCTION

As Richard Jefferson has recently stated in an article on the CAMBIA-BiOS Initiative (see the last paragraph of this article for a discussion), biological innovation is ‘the oldest and most fundamental form of human innovation’ as it involves the most basic needs of human existence: food, health, home building and the formation of communities (Jefferson 2006, 13). And agriculture, of course, is probably the oldest form of biological innovation and certainly the most important one, as it effects our environment, our health, our economies and the fabric of our societies (ibid.). Jack Kloppenburg therefore states at the beginning of his seminal book *First the Seed*, in Marxist terminology, that agricultural biotechnology has always been one of the most fundamental of humanity’s “productive organs”, due to the fact that plants and their products everywhere supply the most basic necessities of human existence, the most basic components of societies’ material base (Kloppenburg 2004, 1). In fact, agriculture forms the very basis of human culture as such, i.e., since the time humans have made the transition from a nomadic, hunter-gathering mode of existence to an agricultural, sedentary one. Agriculture has been the base of human culture since the so-called Neolithic Revolution some 10,000 years ago.

Since the invention in 1973 of genetic engineering technology by Boyer and Cohen, agriculture is in the process of being completely revolutionized. As the French philosopher of technology Bernard Stiegler states, this technology is a so-called *transformational technology*, not just because it enables the manipulation of life at the most fundamental, molecular level, but more profoundly yet in the sense that, *through* this possibility, it fundamentally changes the very conditions under which the transformation of life takes place. Whereas until recently life – even domesticated life - evolved along pathways laid out by ‘nature’ itself, it has now been ‘de-natured’ and turned into an object of technical design. Agriculture has from the very start been a technical practice, a practice through which farmers took care of life, reproducing and also producing it by way of selection. Agriculture is a technical system. Now, according to Stiegler, all technical systems must be understood as systems of care. Human beings are fundamentally technical beings who use technologies to take care of themselves and of the world. Human existence is *essentially* constituted and conditioned by technologies and these technologies continuously evolve. This means that the human being is a being of *adoption*: throughout its evolution and history, humans have always had to adopt new technologies, new technical systems (whose evolution is continuously accelerating). The arrival of a new technical system however, as Stiegler shows following the French historian Bertrand Gille, always causes a *disruption* in the social system, actually destroying the system of care based on the preceding set of technologies.

Initially, then, technological revolutions are *destructive* of ways of life and modes of existence. Only after *adjusting* itself to the new technical system, the social system can invent a new system of care based on the possibilities offered by the new technical system. In our days, agriculture is confronted with a new technological base – biotechnology - which is destroying traditional lives of farmers all over the world. They also embody the possibility, though, of a new agriculture. However, this possibility is seriously frustrated at the moment, because the new biotechnologies are predominantly exploited by big multinationals who employ them to short-circuit the role of farmers in agricultural production in their pursuit of profit. Farmers are expropriated of their knowledge and knowhow and dispossessed of the care and responsibility for the living, i.e., they are proletarianized. This proletarianization is heavily rejected of course, but mostly this is accompanied by a rejection of biotechnology as such. This is a grave mistake, however, because it is precisely - and *only* - on the basis of these new technologies that the battle against proletarianization can and should be fought. In what follows I will try to show, on the basis of Stiegler’s theory of techno-evolution and his notions of technology as a *pharmakon*, how this is to be understood. I will also suggest that

the various open source and commons-based biotech initiatives that are currently springing up everywhere should be interpreted from the perspective of deproletarianization.

2. AGRICULTURE AS A SYSTEM OF CARE

As the Stiegler emphasizes, agriculture – like *any* mode of being of *culture* – has to be understood first of all as a *system of care* (Stiegler 2007, 216). From its very beginning, agriculture is a *taking care* [*prendre soin*] of the living, a cultivation of life, by the farmer. Farmers take care of the living for the purpose of providing the means of *subsistence*. But not only that. As a mode of being of culture, agriculture is also always a taking care of human *existence*, and of assuring that this existence does not fall back to a purely subsistent mode of being (like that of animals). And human existence – i.e., the ek-sistent mode of being of humans¹ – is only possible through a projection on what Stiegler calls (employing a terminology derived from Gilles Deleuze) the plane of *consistence*, i.e. the domain of ends and goals and motives for living, which is a domain that neither exists nor subsists but that nevertheless forms the *condition* of human existence. It con-sists, giving consistence to human subsistence and existence. In more familiar terms this is about the long-term perspective. What is usually neglected in historical accounts of agriculture is the fact that the origin of agriculture is cotemporaneous with the origin of the *cult* of sacrificing, which signifies an investment in the plane of consistencies². Agriculture is – or forms the basis of - a mode of *culture*, of elevation from natural life, of civilization.

Agriculture, like all culture, is a system of care [*système de soin*]. This is to say that it is a kind of therapeutic [from the Greek word *therapeuein*: to care, to take care] in the sense that the practice of agriculture as the cultivation of (vegetable) life and, with it, the creation of artificial ecosystems, entails a violation of the natural world, a disequilibrium of ecological balances. In taking care of the living, farmers simultaneously inflict violence upon it. The cultivation of the land necessarily implies a violation of nature. Farming is both a cultivation and a violation. Cultivating nature is *at the same time* violating nature and this violation has to be tempered and sublimated. This sublimation happens through cults, through religious cults of offering and sacrifice. The appearance of the farmer, therefore, goes together with the appearance of the figure of the priest. The farmer and the priest, but also the artisan and the soldier, are figures that appear with the rise of agriculture.

Agriculture is a system of care, according to Stiegler, because it is essentially a *technical system*. In the first volume of his magnum opus *Technics and time*, Stiegler develops the thesis that the evolution of humanity has to be understood in essence as a process of techno-evolution, i.e., as the event of the technical exteriorization of life (Stiegler 1998)³. Anthropogenesis is technogenic through and through and the origin of the human is to be found in the appearance of technical systems, the first one being the lithotechnic system, which originated some three million years ago and which started the process of hominization.

¹ Stiegler's notion of 'existence' derives from the work of the German philosopher Martin Heidegger, in particular from his book *Being and Time* (1927), which provides a phenomenological analysis of existence [*Existenz*] as the way of being characteristic of humans.

² The origin of agriculture is also at the same time the origin of cities, of urbanization, and there was never farming without urbanization. The historical opposition of city life and country life is a false one in the sense that cities and farmlands co-originated.

³ Stiegler's sources here are the paleoanthropologist André Leroi-Gourhan, the historian of technology Bertrand Gille and the philosopher of technology Gilbert Simondon.

Agriculture and sedentarization, and the mnemotechnical system of writing invented along with it, are very recent phases in this process, inaugurating the historical mode of human existence.

3. AGRICULTURE AS A PROCESS OF INDIVIDUATION

The human is unique because it has evolved not from a process of bio-evolution but from a process of techno-evolution, based on a third, *extra-biological memory* or inheritance system: technics, i.e., technical artefacts. Stiegler theorizes technics as an external memory system that intimately interacts with human biological evolution and has – as such - deeply transformed the human by totally changing the conditions of its evolution. Thanks to technics, human evolution has embarked on a process Stiegler calls ‘epiphylogenesis’, which means a process of evolution in which individual experience [*epi-*] acquired during the life of the individual can be transmitted to the species as a whole [*phylo-*], thanks to its inscription in externally located technical artefacts (products of technical exteriorization) serving as intergenerational memory carriers. Since the onset of epiphylogenetic evolution, human evolutionary selection processes proceed intrinsically via this technicity. With respect to agriculture this also means that the farmer as the one who takes for the living is also always *selecting* the living through technics. As a technically equipped and educated selector-cultivator, the farmer is not simply a *reproducer* of life but also a *producer* of life. He breeds new life, new varieties, and not only that, in doing so he also transforms his way of life, he transforms his *world*. In transforming the world, in forming new worlds, he must *take care* of this world and this taking care – as the essence of *agriculture* - is a therapeutics that involves techniques which have essentially the character of *pharmaka*, of being both toxic and detoxifying (as I will explicate below). It also involves the knowledge, the know-how [*savoir-faire*], the skills and the expertise based on these technologies. It is in particular this know-how that ‘makes the farmer’, that constitutes his way of life, his existence.

The appearance of a new technical system always involves the appearance of a new kind of society and new kinds of social roles, or what Stiegler calls – after Gilbert Simondon - a new modality of the process of psychic and collective individuation. Like his predecessor, Stiegler conceptualizes human individuals and societies explicitly as open-ended, never completed *processes* of individuation and shows that humans and societies cannot be understood independently of each-other but can only exist as co-individuating processes. What is more, however, Stiegler argues that the process of psychocollective co-individuation is always – and essentially - constituted and conditioned by a technical milieu or technical system that first of all enables the articulation of individuals and society. This system is itself individuating. Human culture has to be understood, therefore, as a three-tiered process of individuation, as a continuous co-evolution of psyches, collective and a technical system. This three-tiered process is – as open-ended and driven by tendencies and counter tendencies – always in a state of metastable equilibrium.

Agricultural systems must also be understood as processes of such a kind, involving a common technological base and a variety of socio-technical roles. To be sure, agriculture actually involves a fourth process of individuation, which is the process of *vital* individuation of the plants itself. As a matter of fact, it can be argued that agriculture is centered around the care for – and the technical improvement of - processes of vital individuation of crops. What distinguishes contemporary agriculture from traditional agriculture, of course, is the fact that

today it has become possible to directly intervene – through genetic engineering technologies – in these processes of vital individuation⁴. This possibility is revolutionary, and as such it encounters much resistance.

Now, Stiegler argues that it is the individuation c.q. evolution of the technical system that has a structural priority over psychic and collective individuation. Technical evolution means innovation and innovations always cause a ‘suspension’ – a ‘putting out of order’ - of the former technical system upon which social and cultural roles were based, disrupting them and ultimately rendering them null and void. A new technical system has to be *appropriated* by the social system, i.e., the social system needs to *adopt* the new technologies in order to build new social and cultural practices around them - in casu new *agricultural* practices. In other words: society has to *adjust* itself to the new technical system and this always involves moments of resistance as technological change involves the destruction of the familiar frames of reference upon which social systems are based (Stiegler 2009, 2).

4. THE BIOTECHNOLOGY REVOLUTION AND THE CORPORATIZATION OF AGRICULTURE

At the moment, we are in the midst of a huge rupture in the technological base of our societies, a rupture that will deeply change the way human life will be organized in the future and will very probably involve a break with the epoch of sedentarization, to which agriculture paradigmatically belongs (Stiegler 2007, 219). This rupture first of all consists in the shift from writing to digital - increasingly networked and mobile - information and communication technologies, transforming our traditional literary - printing based - societies into today’s - ICT based - global information societies, and secondly, in the invention of biotechnology, which has the potential – combined with the IC technologies - to revolutionize the practice of agriculture on a global scale, with enormous implications for farmers’ lives all over the world, but also for ‘the consumer’. Genetic engineering, cloning, genomics, proteomics, systems biology, synthetic biology, etc. are no longer like traditional breeding techniques in that they imply the possibility of directly intervening in the genetic *modus operandi* of living organisms. Stiegler calls these new biotechnologies – along with nanotechnology and neurotechnology - transformational technologies because they enable the transformation of the very processes of transformation underlying the evolution of life. In fact, they transform the very *nature* of the natural processes of life, *denaturalizing* these processes by technologically altering the very operational dynamics of which they consist. This represents an unprecedented break in the history of mankind, and this break is the source of much unease and anxiety among people⁵.

Now, these new powerful technologies encounter much resistance all over the world, in particular from farmers and especially from indigenous farmers. The prime reason behind this resistance is not very hard to understand, in fact: farmers reject these new technologies because they experience them as a threat to their traditional ways of living, not only to their modes of subsistence but also to the modes of existence and consistence based on them. It is this threat of destruction of their very ways of living which evokes such fierce and even

⁴ According to Jack Kloppenburg, genetic engineering technology makes possible for the very first time in human history the alteration of ‘species being’ (Kloppenburg 2004, 2)..

⁵ As Kloppenburg writes: ‘We are now witnessing a radical recharacterization of the nature of the link between the “productive organs of man in society” and the productive organs of living creatures’ (Kloppenburg 2004, 3).

violent opposition to genetic engineering technologies. What farmers perfectly well realize is that these new technologies have the potential of depriving them of their traditional know-how, i.e., of their traditional ways of breeding and selecting crops and, as such, of depriving them of the care and responsibility for the living that has traditionally been entrusted to them. Ultimately, they feel deprived of their right to exist.

With biotechnology becoming prevalent, the care and responsibility for the living is more and more transferred from farmers to biotechnologists or at least has to be shared more and more with biotechnologists. This could in principle lead to fruitful cooperation and sharing of responsibility of course but the problem is that today, these biotechnologies are everywhere turned into private property - through aggressive intellectual property legislation - by big agrotech multinationals, with the principal aim of acquiring monopolies and ensuring profits, not of providing farmers with new innovative breeding tools⁶. It is this corporatization of agriculture, i.e., the privatization and corporate control of the process of agrotechnological innovation, and *not* the technologization of agriculture *per se* as I will argue, that represents the biggest threat to the know-how of farmers and to the care and responsibility for the living accompanying it.

As Kloppenburg has shown, genetic engineering technologies ideally enable the capitalist penetration of agriculture and the conversion of farming into a wage-labor activity, thereby transforming the farmer into a proletarian (Kloppenburg 2004, 9ff). This process of proletarianization of the farmer allows for the exploitation of his labor force, of course, but what is even more troubling, according to Stiegler, is the fact that this proletarianization actually involves a reduction of the existence of the farmer – of his way of living – to the level of subsistence, i.e., the substitution of a *mode of living* with a *mode of employment*. Reduced to a subsistence mode of living, farmers lose the knowledge and know-how through which they have always exercised their care and responsibility for the living. In fact, for Stiegler, the essence of proletarianization precisely consists in the loss of knowledge and know-how and thereby the loss of participation in the transformation of the world. While discharging the farmer of the care and responsibility for biological innovation, corporate-led, privatized agriculture is not replacing it with an alternative practice of care and responsibility. On the contrary, it replaces it with a systematic *carelessness* and a complete *absence of responsibility*, as I will argue.

5. THE PROLETARIANIZATION OF THE FARMER AND THE LOSS OF CARE AND RESPONSIBILITY

Proletarianization is a Marxist concept that refers to the process through which workers or farmers who are originally self-supporting and possessive of their own means of production become dispossessed of these means and turn into (or better: *are* turned into) paid wage-laborers, working for money with an employer (who buys and uses their labor force in order to make commodities to be sold for profit). In a note to the 1888 English edition of the *The Communist Manifesto*, Friedrich Engels defines the proletariat as ‘the class of modern wage-labourers who, having no means of production of their own, are reduced to selling their labour

⁶ Cf. ‘Today control over agricultural biotechnology is effectively limited to a few multinational corporations who integrate seeds, agrichemicals, and biotechnology. This disturbing consolidation of power is matched with a trend toward “me-too”, big-ticket “innovations” of remarkable dullness’ (Jefferson 2006, 14).

in order to live' (Marx & Engels 2002, 219). As is well known, Marx and Engels describe modern industrial society as a society in which two great classes are opposed to each other (and will eventually wage a battle for supremacy): the *propertyless* proletariat and the *property-owning* bourgeoisie, who are the employers of wage labour and the owners and directors of the means of production. The prime meaning of proletarianization for Marx and Engels consists in the status of being a wage-labourer, in the condition of being dependent for one's life and survival upon labor [*Arbeit*], i.e. wage-labor that serves the increase of capital and that is forced to offer itself as a commodity like all other commodities on a labor-market. Proletarians, they state, can only make a living by selling themselves – in the form of labor power or better: of the capacity to labor - to the bourgeoisie.

As Kloppenburg emphasizes, the proletarian condition is characterized by the dispossession of the means of production, which then necessarily implies the generalization of commodity production. Historically, the dispossession of workers' means of production has been achieved through a process of *primitive accumulation*, separating the worker from the means of production, which are turned into private property by capitalists (Kloppenbug 2004, 9). Primitive accumulation, as Marx wrote in the first volume of *Capital*, 'is nothing less than the historical process of divorcing the producer from the means of production' (Marx 1977, 875)⁷. In agricultural production, this has meant an ever growing separation of the farmers from the means of farming and a progressive transformation of agriculture into agribusiness, implying a loss of autonomy for the farmer (Kloppenbug 2004, 10). Farmers are not only dispossessed of the *means* of production of course, but are also deprived of the products of their labor, which return to them on the market in commodity form. The effect of agriculture turned into agribusiness, as Richard Lewontin states in an article on the maturing of capitalist agriculture, is that: 'the farmer becomes a mere operative in a determined chain whose product is alienated from the producer. That is, the farmer becomes proletarianized' (Lewontin 2000, 97).

It is important to stress that proletarianization for Marx and Engels is not synonymous with pauperization, i.e. the deterioration of living standards, and also that the proletariat is not identical with the working class *per se*. This is a misunderstanding that is still widespread, and not in the least among Marxists. It is true, and it was particularly true in the 19th century, that proletarianization leads to pauperization, and it is also true that most proletarians then were members of the working class, but the true meaning of proletarianization is the fact of being subjected to make a living on the basis of wage labor. It is not only the factory workers, but also the 'the physician, the lawyer, the priest, the poet, the man of science' that are turned into paid wage-labourers by the capitalists (*ibid.*, 222). Under capitalist conditions, in fact, all of society tends to fall victim to the process of proletarianization, first of all the lower strata of the middle class – partly because their specialized skills are being replaced and overruled by industrial methods of production – but eventually all the other classes as well. Thus Marx and Engels write: 'the proletariat is recruited from all classes of the population' (*ibid.*, 228).

⁷ The adjective 'primitive' suggests that these processes of appropriation are a thing of the past – a unique, original impetus that initiated the 'normal' capitalist process of accumulation by appropriation of surplus value - but as David Harvey has shown, it is an ongoing phenomenon intrinsically belonging to capitalism. In fact, he argues, 'its continued existence may well be fundamental to the survival of capitalism' (Harvey 2010, 308). He therefore suggests another, more adequate term for this phenomenon: accumulation by dispossession. Especially in recent times, neoliberal capitalism has overwhelmingly operated through processes of accumulation by dispossession. The rush to privatize germplasm and genetic technologies through patenting by the big agrotech multinationals is a perfect example of accumulation by dispossession.

The expression 'proletarian' derives from the Latin *proles*, which means 'offspring' and refers to those with no property, whose only wealth consists in their reproduction and whose life is reduced to their capacity for laboring, hence remains on a pure subsistence level. This reduction of autonomous skilled work to [abstract] labor power is concomitant of course with the mechanization and industrialization of the production process, a development famously described by Harry Braverman in the 1970^s as *deskilling* (Braverman 1974). As such, the work of proletarians, to quote Marx and Engels a last time, 'has lost all individual character, and, consequently, all charm for the workman. He becomes an appendage of the machine, and it is only the most simple, most monotonous, and most easily acquired knack, that is required for him' (Marx & Engels 2002, 227). Work within a capitalist framework is reduced to pure, deskilled and therefore unqualified labor power, *travail sans phrase* (Gorz 2009, 97).

6. PROLETARIANIZATION AND THE FORMATION OF DISSOCIATED MILIEUS

In the terminology used by Stiegler, the proletarian is the one who has lost his know-how - his *savoir-faire* - and it is in this loss of know how that the veritable, and most problematic essence of proletarianization consists⁸. Most problematic because it implies a dispossession of (the means) of taking care and responsibility for the living, which is exercised by farmers through their knowhow – and more encompassingly through their way of life, their 'knowing how to live' [*savoir-vivre*]. And it is *this* care and responsibility – which elevates them above subsistence and makes them *existent* human beings - that farmers all over the world do not want to give out of hand⁹. Lewontin states that 'the essence of proletarianization is in the *loss of control* over one's labor process and the alienation of the product of that labor' (Lewontin 2000, 97; my emphasis), but more severely in the long run is that through this loss of control farmers lose their knowhow, and eventually their way of life (as well as their knowledge of how to live). This deprives them of every possibility of exercising care and responsibility.

As I already pointed out, the loss – and that ultimately means: the destruction - of knowhow and knowledge is the essence of proletarianization according to Stiegler. This loss and destruction inevitably leads to the destruction of the processes of psychic and collective individuation as described above, as these only proceed through the development of knowhow and knowledge. Proletarianization, in the language derived from Simondon, leads to processes of *disindividuation*. Another way to describe the effects of proletarianization is to say that it results in the formation of *dissociated milieus*, destroying the associated milieus in which it operates. The concept of an 'associated milieu' is again from Simondon, for whom it referred to a technical milieu in which the technical objects constituting that milieu structurally and functionally *associate* all the composing elements, energies and processes within that milieu (Stiegler 2006, 52). Stiegler in particular emphasizes the associative and dissociative effects of a technical system upon the processes of psychic and collective individuation. New technologies – or: means of production - can both intensify *and* erode these processes, i.e.,

⁸ 'Est prolétarisé celui qui perd son savoir : le producteur prolétaire perd son savoir-faire, passé dans la machine, et il devient pure force de travail' (Stiegler 2006, 45).

⁹ When the French farmer and anti-GM and alter-globalization activist José Bové exclaims that he does not want to become a proletarian, he has this loss of care and responsibility of the farmer for the living – and for the food supply and health of the population - in mind (Bové 2005).

they can provoke either association or dissociation. I will come back to this crucial point below.

An associated milieu, for Stiegler, is a milieu in which the people and the collectives who exist in (and on the basis of) that milieu actively *participate* in the *transformation* of their own existence and life world through *practicing* - and not just by *using* or *consuming* - and continuously (re)inventing the technologies that make up this milieu. Proletarianization, as dispossession of knowledge and know how, leads to dissociation and this means ultimately to the destruction of sociality. A typical example of a dissociated, desocialized milieu is the modern Fordist industrial society, which is characterized by an ever-growing separation and opposition of the functions of production and consumption, depriving both producers and consumers of their knowhow and knowledge, thereby destroying their capacity to participate in the socialization of their world through the (technological) transformation of it. In a Fordist society, technologies do not evolve through social practices but are conceived by designers and R&D centers apart from society, and introduced in a society of consumers by marketing and publicity campaigns. This eventually results in today's 'consumer societies', in which social practices have almost completely vanished and have been replaced by preformatted usages and 'lifestyles' prescribed by the market, proletarianizing not only the producers but also the consumers (by depriving them of their *savoir-vivre*). According to Stiegler, today's societies have reached a state of total, generalized proletarianization, which is engendering ever more social and existential malaise and is not sustainable in the long run (ibid., 51). \

7. PROLETARIANIZATION AND THE RUINING OF CARE

Now, the new genetic engineering technologies enable an expropriation of the most important and most central means of production in agriculture, the seed, by appropriation of the germ plasm¹⁰. This implies an expropriation of the knowhow and knowledge of farmers and turns them, as already mentioned, into proletarians, disengaged from the responsibility for the living. This responsibility for breeding and selection will no longer be in the hands of the farmers but is delegated to scientists who are themselves, just like farmers, increasingly working as employees for big corporations. In Stieglerian terminology: farmers - their modes of existence - are in fact *short-circuited* - and thereby made obsolete - through these new technologies (Stiegler 2007, 219). It is this situation that is furiously rejected by farmers all over the world and the reason for their concern is quite obvious: it is all-too-evident to them that the multinationals who actually take hold of the means to take care and responsibility over the living by the seizing of control over the plants through patents on genes and genetically engineered traits, are *structurally incapable* of providing this care and exercising this responsibility, because their principal and ultimate goal does not consist in taking care and responsibility for life but in the making of profits. Being largely a shareholder-driven activity, corporatized agriculture's ultimate *raison d'être* is profit maximization. Agriculture becoming agribusiness means transforming agriculture into an instrument for making profits, putting it in service to the valorization of capital *before* human needs¹¹.

¹⁰ Being both product and central means of production, the seed is the 'alpha and omega of agricultural life' (Kloppenborg 2004, 37). As Kloppenborg has shown, as a biological, self-reproducing entity, the seed has always been an obstacle to capitalist penetration (Kloppenborg 2004, 10). That is, until the arrival of genetic engineering.

¹¹ The most blatant proof of the exclusively profit-oriented nature and therefore the utter carelessness and irresponsibility of corporatized agriculture is of course the use of so-called Genetic Use Restriction Technologies

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Moreover, in the context of contemporary finance-capitalism, which has become more and more a purely speculative endeavor, carelessness and irresponsibility have become a systemic feature. Driven by the unconditional imperative of an ever greater and ever faster return on investment, this speculative capitalism – which has become totally deterritorialized and has completely liberated itself from every public accountability – is only interested in the short-term and is therefore systematically indifferent to long-term prospects¹². As such, it will never be able to challenge the problem of world hunger or willing to find lasting solutions for the ecological crisis that is threatening the continuation of human life on the planet¹³. It is this systemic short-termism of corporatized agriculture that is also guilty of reducing the life of farmers – but also of course of consumers – to the level of subsistence, destroying the horizon of consistence. Incapable of taking care and responsibility for the living, corporatized agriculture *ruins* the system of care that agriculture in its most fundamental sense *is*, i.e., it ruins agriculture *as* a system of care, as a *culture*. And like consumerism and the infinite-growth economy as such, it is unsustainable in the long run¹⁴. It is therefore inadmissible to let agricultural innovation be subjected under the command and the goals of capital. Its imperatives of infinite growth and unconditional profit maximization also totally contradicts the *Imperative of Responsibility* proposed by Hans Jonas as the unconditional, categorical imperative of our technological and ecological future (Jonas 1985).

However, rejection of the privatization and corporatization of agriculture goes often hand in hand with an outright rejection of genetic engineering technology *as such*. Although understandable, this attitude should be criticized. Indeed, rejecting biotechnology because of the corporate annexation of this technology for the exclusive goal of extracting rents from it is ‘throwing out the baby with the bathwater’, as Richard Jefferson has rightly stated (Jefferson 2006, 21)¹⁵. We should distinguish between biotechnology and *corporate* biotechnology, as Kloppenburg remarks (Kloppenburg 2010, 381) and instead consider its potential for an alternative, more pluralist, more just and more ecologically sound agricultural development (Ruivenkamp 2008a). Although it is true, as Kloppenburg, Lewontin, Liodakis and others

(GURT), which enable the complete short-circuiting of biological reproduction. By genetically enforcing the sterility of the offspring of the so-called *Terminator* seeds produced through these technologies, multinationals like Pioneer and Monsanto thought to be able to finally dispossess farmers completely of the care and responsibility for the seed (see for instance Van Dooren 2007).

¹² Cf. ‘Corporations are designed to seek the short to midterm gain. They move to the metronome of the quarterly earnings. The market theory that justifies them, moreover, has no concept of the future in regards to resources. Maximize gain today, and the future will take care of itself, the theory goes. The needs of future generations actually are discounted, which means that market calculus always values the present generation more than it does the future ones’ (Rowe 2008, 147).

¹³ According to Byeong-Seon Yoon, the dominance of agricultural production by purely profit-driven multinationals is already destroying agriculture all over the world (Yoon 2006).

¹⁴ Cf. ‘we know that the way of life in industrial societies’, based on the constant growth of consumption first established in Europe, then transferred to North-America, and now known as the *American way of life*, cannot last. We know that the challenge, in the face of this emergency, is even to put an end as quickly as possible to this way of life that we ourselves, Europeans, have adopted in return: it has already become, in terms of the conditions we are living in today, “unsustainable”, and will become massively and irreversibly deadly if adopted by the three billion human beings now “modernizing”, who appear to be driven by an ultraspeculative and completely insane logic, taking care of *nothing*, frequently criminal, spreading care-less-ness everywhere’ (Stiegler 2010, 183).

¹⁵ Cf. ‘Perhaps the greatest crisis that has emerged from this corporate control of problem-solving in agriculture is that the public now seems to have very little confidence in the use of any science in agriculture! This has indeed been a case of throwing the baby out with the bathwater’ (Jefferson 2006, 21).

have shown, that genetic technologies are *the* route through which capitalism has been able to penetrate agriculture, the introduction of these technologies in agriculture does not necessarily imply their proletarianizing – and therefore careless and irresponsible - deployment by capitalism¹⁶. They can be (re)possessed and (re)appropriated by farmers and turned into *new tools* for taking care and responsibility, tools for a new, *technologized and industrialized yet not proletarianized* agriculture. The refusal of corporate agriculture should not lead to a refusal of the (bio)technologization of agriculture as such. Not only is it unwise – if not outright impossible - to resist the process of biotechnological innovation, the new tools of molecular biotechnology carry an enormous potential for transforming global agriculture *for the better*. Their social, economic and ecological promise is huge¹⁷ What *should be rejected*, and emphatically resisted, however, is the proletarianizing ways in which they are put to use.

This *re-sistance*, as I will argue in the remainder of this article, should be conducted – in a non-reactionary way - with a view to the development of new modes of *ek-sistence*, i.e. new modes of life and taking care of life made possible on the basis of the new technological tools. This means: the proletarianization of agriculture by capital via biotechnology should be countered by a process of *deproletarianization*, and this can only be done on the basis of this very technology itself. It is only by way of a reappropriation of the new tools of biotechnology that this process of deproletarianization can and should proceed. Of course this also implies the necessity of a radical restructuring of the intellectual property (IP) regimes in agriculture. I will suggest at the end of this paper that open source and commons-based property regimes may be best suited to such a project of deproletarianization.

8. PROLETARIANIZATION AND TECHNOLOGIZATION

As already mentioned above, Stiegler argues - on the basis of both structural and historical analyses - that the arrival of a new technical system – a new set of basic technological tools - always causes a disruption of the processes of psychic and collective individuation, because it engenders a *suspension* of the ways of life, the social practices and the knowledges and know how based on the preceding technical system (Stiegler 2001, 25). Although I cannot provide a detailed account of it here, Stiegler conceptualises technological innovation in general as processes of *grammatization*, i.e. as processes in which human comportments (speaking,

¹⁶ Although it is indeed true, as Melinda Cooper shows, that ‘the emergence of the biotech industry is inseparable from the rise of neoliberalism’ (Cooper 2008, 19) and, as Kaushik Sunder Rajan writes, that ‘biotechnology is a form of enterprise inextricable from contemporary capitalism’ and ‘that the life sciences and capitalism are coproduced’ or even ‘that the life sciences are *overdetermined* by the capitalist political economic structures within which they emerge’ (Sunder Rajan 2006, 3, 6), they can be turned to the advantage of countering these structures and eventually maybe even overturning them.

¹⁷ However, as Denis Murphy observes in a his comprehensive historical survey of modern plant breeding and biotechnology, transgenesis technology until now has not quite lived up to its spectacular promises. As he puts it: ‘So far, only a very limited portfolio of extremely simple traits has been amenable to the transgenic route, which means that while transgenesis has had some modest successes over het past decades, its scope for effecting a wide range of crop improvements remains somewhat restricted at the present time’ (Murphy 2007, 48). Soberly assessing the current state of affairs, he observes: ‘despite a great deal of hype, commercial transgenesis is at present a pretty clunky and restricted technology that can only address a few relatively minor traits out of the dozens of others that are of interest to farmers’ (ibid., 175). His conclusion is that ‘once the current overhyped expectations of transgenesis have subsided, the technology will become a routine option for the enhancement in many, but by no means all, agronomic traits. But transgenesis will always remain just one component of the breeder’s toolkit (ibid., 298).

working, producing, etc.) but by extension all kinds of continuous processes, are described, formalised and discretized (i.e., partitioned into a finite set of discrete elements) so that it becomes possible to exteriorise them and inscribe them into technical objects and from then on *reproduce* them indefinitely. For instance, the letters of the alphabet are a grammatization of spoken language, which allows its material reproduction in writing (the invention of the printing press, based on metal printing types, is a further phase in the grammatization of language). Other examples are the grammatization of the gestures of workers and their implementation in machinery, and the grammatization of the audiovisual with the invention of first analog then digital recording technologies (gramophone, photography, audiotape, video, DVD, etc.). Most recently, biotechnology (genetics, genomics, transcriptomics, proteomics, etc.) has enabled the grammatization of life and with it the technical reproducibility of the living¹⁸.

Now Stiegler's thought-provoking thesis is that grammatization is the principal factor behind proletarianization, that is to say: its condition of possibility (Stiegler 2010b, 11). This is due to the fact that grammatization implies the inscription of knowledge and know how – in our times re-formatted as 'information' - in technical artefacts. i.e., in devices, machines or computers. In biotech this means the 'deciphering' of the genetic code (perceived as the 'essence of life') and its insertion into bacterial vectors or its conversion into computer code, on the basis of which it becomes possible to artificially synthesize genetic codes (via PCR) and re-insert them into living systems, thereby altering their 'essence' on the most fundamental, molecular level. This grammatization of life in fact enables the short-circuiting of the process of reproduction of living organism and, with it, the short-circuiting of the knowledge and knowhow of those who have traditionally been endowed with the care and responsibility for the reproduction of the living (and as selectors also with the production of the living, i.e. the creation of new life): the farmers. This actually deprives farmers of their way of life, proletarianizing their mode of existence. So, in conformity with the analyses of Kloppenburg and Lewontin, Stiegler shows that it is thanks to grammatization, i.e. through technology, that proletarianization is possible in the first place.

The problem with proletarianization consists precisely in the loss of knowledge and know how - and therefore the loss of control of farming – of the farmers. They lose it to the scientists and the companies who privatize this knowhow and knowledge. Based essentially on a process of technical individuation, the processes of psychic and collective individuation of farmers find themselves short-circuited because they are detached from the process of technical individuation. Proletarianization therefore induces a process of *disindividuation*. Like factory-workers before them, who lost their knowledge and know how - and became simple servants - to machines more and more individuating autonomously (designed by engineers at the directives of managers), now farmers are losing theirs to biotechnology (designed by bio-engineers under supervision of the CEO's of big multinationals, who are themselves under control of shareholders). The upshot of this is a loss of participation of the farmers in the development c.q. the evolution of their 'own' technical milieu, that is to say: in the very

¹⁸ Cf. 'Grammatization is the process through which the flows and continuities which weave our existences are discretized : writing as a discretization of the flow of speech, is a stage of grammatization' (Stiegler 2010b, 31-2). Also : 'Grammatization is the history of the exteriorization of memory in all its forms: nervous and cerebral memory, corporeal and muscular memory, biogenetic memory' (ibid., 33). Stiegler borrows this term from the French linguist Sylvain Auroux, who uses it only for linguistic grammatization processes. Stiegler's notion is more comprehensive, encompassing all memorization processes.

conditions determining agricultural production. This results in the formation of *dissociated* milieus, in which there is no association anymore between farmers and the technical system, neither between farmers among each-other. This finally means the ruining of their existence (and consistence) and its reduction to subsistence (read: to the condition of wage-laborer-consumer)¹⁹. The technical, exterior milieu of agriculture in its turn becomes stripped of the interior milieu of psychocollective individuation, which inevitably, in the long run, leads to entropy as its human energy (and motivation) base has thereby been taken out. Ultimately agriculture as a system of care collapses.

9. THE PHARMACOLOGICAL NATURE OF TECHNOLOGY

However, and this is crucial, the new biotechnologies also present the possibility of a new agriculture. Although the introduction of biotechnology in agriculture presently causes proletarianization through short-circuiting of the individuation processes of farmers - thereby ruining it as a system of care -, it can also, and in all probability *must*, become the basis of a new agriculture, i.e., a new system of care. As Stiegler shows, technologies - as the material effects of grammatization processes - are *intrinsically ambiguous*, in the sense that they can both foster and intensify *and* ruin and erode processes of psychic and social individuation. Differently put: technologies can be conducive of both disindividuation and individuation (the former being more or less synonymous with proletarianization). It is for this reason that he theorises technologies fundamentally as *pharmaka* (Stiegler 2010, 40ff)²⁰.

Pharmakon is a Greek word which means both poison and medicine (or cure)²¹. Technologies as *pharmaka* can both poison processes of psychocollective individuation and be employed to cure these processes. As a matter of fact, the *only* way to cure the poisoning effects of technological *pharmaka* is via these very same *pharmaka* (this is the pharmacologic behind all *techno*-logy), and that is by developing *practices* around and on the basis of these *pharmaka*, practices of *care* (Stiegler 2007, 222). What decides whether *pharmaka* act as a poison or function as a medicine, i.e., as a therapeutic, is the presence or absence of a practice of care. Now, what the privatization and therefore desocialization of the new biotechnologies by the big agrotech companies in today's agriculture precisely prevents is the formation of such practices of care around these technologies. The processes of innovation in biotechnology are everywhere privatised and put under control of finance capitalism, short-circuiting the farmers as selectors - i.e., destroying the processes of psychocollective

¹⁹ Cf. 'The farmer does own some of the means of production, land and buildings, but has no control over the labor process or over the alienated product. The farmer has then become the typical "putting out" worker characteristic of the first stages of capitalist production in the seventeenth and eighteenth centuries. What the farmer has gained is a more stable source of income, at the price of becoming an operative in an assembly line. The change in the farmer's position from an independent producer, selling in a market with many buyers, into a proletarian without options' (Lewontin 2000, 105).

²⁰ Stiegler has developed his notion of *pharmakon* in particular with respect to information and communication technologies, much less with respect to biotechnology, but the logic of the *pharmakon* operates in both domains in similar ways. However, biotechnology crucially differs from all the technologies that came before it, in that it is a process of grammatization that does not follow the path of technical *exteriorization* of the living anymore, but involves an *interiorization* of technology in the living (Stiegler 2007, 221). This represents an unprecedented break in the history of humanity and makes biotechnology so extremely uncanny in the eyes of the public of course.

²¹ Stiegler uses the notion of *pharmakon* in a similar way as his master Jacques Derrida, who has taken it again from Plato's dialogue *Phaedrus*.

individuation through which farmers traditionally took care of the living - and inducing dissociative, care-less and ir-responsible milieus.

The new biotechnologies offer the possibility of a new, globalized and industrialized agriculture, but *only* on the condition that they can be appropriated by the actors within the technical milieu in which they are introduced, so that they are able to develop new practices and new modes of existence on the basis of these technologies. This possibility is currently frustrated because of the excessive privatization, i.e. dispossession and enclosure of these technologies. The corporations who have massively taken hold of all these new, powerful and promising tools for innovation are emphatically unable – by virtue of their very nature - to rebuild a system of care, and to restore a long-term perspective, which is absolutely necessary for the creation of a new global agriculture, in terms of a reconstitution of new modes of psychocollective individuation²².

‘Global’ does not mean that a uniform system of care should be invented that is everywhere the same and should be adopted by *all*. On the contrary, deproletarianization allows for the opportunity to adapt and attune biotechnologies to specific local needs and circumstances, precisely because it involves an ‘endogenization’ of agricultural innovation, to use an expression developed by Van der Ploeg et al. (1994) and further elaborated by Vroom et al. (2007). Deproletarianization deeply resonates with the idea of endogenizing technology development as theorized by these authors²³. It is also explicitly aimed at the reconstitution of autonomy and independence of farmers, who should become *active* innovators again instead of *passive* receivers and users of technologies designed outside of their use-context, supplied with a *technical code* tailored to the imperatives of the corporate food system (Vroom et al., 22-3)²⁴. Only a deproletarianized agriculture, in which farmers can take control again over the means of production and ‘be in charge’ again of agricultural innovation, allows for the redesigning and the ‘tailoring’ of biotechnologies by farmers for their own specific context (Ruivenkamp 2008).

The impending proletarianization of agriculture, made possible by and implemented through biotechnology, needs to be countered with a resolute project of deproletarianization, not by rejecting the new biotechnologies but by reappropriating them, socializing them and turning them into elements of a new technical milieu that can function as the basis of a new, global agriculture. The future of biotechnologized agriculture cannot be entrusted to private companies who are totally devoid of care and incapable of taking responsibility for life on earth, both the life of crops and the life of the people who live from these crops. We cannot allow that the processes of innovation in agriculture remain under the command of a reckless

²² And as Richard Jefferson writes, besides the profit motive, the intentions of most patent holders in the domain of biotechnology is uncertain and in any case not subject of collective deliberation: ‘The platforms on which we must build are privatized and enclosed, but the owners and their ambitions are completely unclear; the platform for future innovation is built on shifting sand’ (Jefferson 2006, 23).

²³ And their accompanying idea that technology and society *co-construct* each other and that technology can only be understood in terms of ‘socio-technical ensembles’ – a notion introduced by Wiebe Bijker and Trevor Pinch (Bijker et al. 1987; Bijker & Law 1992) – comes close to Stiegler’s concept of the co-individuation of collectives and technical systems, although for Stiegler the relationship between technology and society is not symmetrical, as techno-genesis is always structurally prior to socio-genesis (Stiegler 2009, 2).

²⁴ The notion of ‘technical code’ comes from the Canadian critical constructivist philosopher of technology Andrew Feenberg, who defines it as ‘the realization of an interest in a technically coherent solution to a general type of problem’ (Feenberg 2002, 20). The hegemony of the capitalist mode of production, according to Feenberg, is largely an effect of technical codes that ensure its ‘operational autonomy’ in societal contexts (ibid., 76).

and exclusively profit-oriented capitalism²⁵. To prevent a rampant decline of agriculture into agribusiness and to allow for the possibility of reconstituting agriculture as a system of care, we need to socialize the new technologies and make the future of agriculture subject to our *collective* responsibility. The deproletarianization of agriculture, an absolute necessity for the future of humankind, therefore needs to go hand in hand, as Kloppenburg emphasizes, with a battle for the *repossession* of the means of taking care of agricultural production, which has always been a social activity – i.e., a process of psychocollective individuation - based on the *sharing* of knowledge and know how (Kloppenburg 2010)²⁶.

10. DEPROLETARIANIZATION, OPEN SOURCE AND COMMONS

The need for a socialization and democratization of global agriculture has been argued for by many authors and for many years now (e.g. Magdoff et al. 2000; Kloppenburg 2004; Bové & Dufour 2005). Marxist authors like Liodakis have even proposed that it is necessary with respect to agriculture ‘to reassert today, [...] that a communist-oriented transformation of production would be the only true solution of ecological and social crisis, and that any reform within capitalism, even if necessary, will not be sufficient to resolve the problem’ (Liodakis 2003, 65). This would involve nothing less than ‘eliminating all private property in the means of production and subsistence’ (Liodakis 2003, 68) and the establishment of ‘common control und unrestricted access to all means of production and subsistence, including the results of scientific and technological development’ (ibid., 68-9). Ideally, according to Liodakis, ‘the common accessibility of the means of production will allow a collective organisation of production, by associated or independent producers, and this production would be for use, and would ensure both equitable distribution and ecological sustainability’ (ibid., 69). Now, of course we are still very far yet from such a radical socialization and democratization – or more precisely: commonization - of agriculture, but over the last few years there have been some interesting developments going on in intellectual property legislation which at least point in that direction. I am referring of course to the phenomenon of open source and I want to conclude this article with the suggestion that this is - at the moment - probably the most promising way to initiate the process of deproletarianization.

Since the beginning of this century, primarily as a response to the increasingly felt negative effects on innovation of aggressive patenting strategies of large multinationals (both in agrobiotech and in the pharmaceutical industry), a growing number of initiatives have been launched that propose to base innovation processes in biotechnology on a completely different property regime, i.e., one that is the exact opposite of the dominant proprietary regime and centers around the notion of *sharing*. These *open source* initiatives take their inspiration from the IT-sector, where open source refers to software development practices and licensing policies based not on proprietary code but on a shared, openly accessible and freely usable *source code* (Perens 1999).

Open source evolved out of the so-called Free Software Movement (FSM) founded by MIT hacker Richard Stallman in the early eighties as a response to the privatization strategies succesfully undertaken by the likes of Microsoft, Symbolics and AT&T and the subsequent

²⁵ This would confront us with the horrible scenario, as Melinda Cooper puts it, ‘that life becomes, literally, annexed within capitalist processes of accumulation’ (Cooper 2008, 19).

²⁶ Cf. ‘For thousands of years biological innovation has been informed and guided by keen observation and the accumulation and sharing of generations of empirical knowledge’ (Jefferson, 13).

rise of a proprietary, copyright culture in the software industry. Stallman characterized the software that would lead in 1991 to the birth of the famous Linux operating system as ‘free software’ and emphasized that ‘free’ was to be understood here in terms of liberty, not price, famously stating that ‘to understand the concept, you should think of free as in free speech, not as in free beer’ (Stallman 2002, 43). Aware of the huge importance for computer users to be able to tweak and modify the software programs they were using to their own specific wishes and purposes, Stallman decided that instead of protecting the commercial interests of the *owners* and *sellers* of software - the prime motive behind proprietary software packages - free software should emphatically protect the interests of the *users* of software. As he stated in the Free Software Definition: ‘Free software is a matter of the users’ freedom to run, copy, distribute, study, change and improve the software’ (Stallman 2002, 43). Free software therefore protects the interests of the user, by guaranteeing the right to share and distribute, not the right to exclude. As such, it is an inversion of the logic of proprietary software. Another crucial difference with proprietary software is that free software is not produced *for profit* but *for use* and for the benefit of the community; it installs not a market-oriented but community-oriented innovation ecology.

To ensure that the rights of users continued to prevail over the rights of owners, Stallman needed a legal framework that guaranteed user’s continuous access to the source code. For that he invented an ingenious licensing mechanism diametrically opposed to the conventional proprietary mechanism of copyright protection, called ‘copyleft’. Copyleft is the reverse of copyright in that it emphasizes the rights of users instead of those of owners. It ensures that all subsequently modified and extended versions of that software remain freely accessible, by prohibiting all claims of exclusive property rights. This is a noncommercial incentive for cooperation and gives free software its famous ‘viral’ character, i.e., its licensing logic enforces a community of users-producers to continually expand the commons instead of restricting it. As such, it stipulates and protects *common ownership* of software and prevents uncooperative users from converting modified free software into proprietary software. It has a ‘commonizing’, anti-privatizing and anti-commoditizing effect. Copyleft, therefore, creates a *protected commons* and not an open access commons, which is typical of unprotected public property (Kloppenborg 2010, 369, 374).

Open source represents a more pragmatic, if not opportunistic, approach to the principles of free software, adapting the nonproprietary practices invented by the FSM for business purposes. According to the FSM, this adaptation is inconsistent with the principles and ethical values behind the original FSM. In their attempt to appeal to business executives, the proponents of open source are inclined to refer only to the technical and economic benefits of free software – as being more reliable, powerful, and cost-effective than proprietary software - while avoiding to talk about the more principal but evidently less ‘marketable’ issues of freedom and autonomy, which are the ultimate motives behind the free software phenomenon. The FSM has explicitly distanced itself from the Open Source Initiative (OSI), arguing that free software and open source are based on fundamentally different values. Whereas the latter has a clear, principled, political and ethical intent, the former exhibits a more technical and economic stance, withholding itself from any reference to ethical values²⁷.

²⁷ As stated by Stallman: ‘*Open source is a development methodology; free software is a social movement. For the free software movement, free software is an ethical imperative, because only free software respects the users’ freedom. By contrast, the philosophy of open source considers issues in terms of how to make software “better” – in a practical sense only. It says that non-free software is a suboptimal solution. For the free software*

11. DEPROLETARIANIZATION AND THE HACKER ETHIC

What is important to realize is that the Free Software Movement evolved out of the ‘hacker culture’ of the sixties and seventies and is explicitly founded on the principles of the so-called ‘*hacker ethic*’, an expression coined by Steven Levy and further elaborated by Pekka Himanen in his famous book bearing the same title (Levy 2001, Himanen 2001). The first principle of this hacker ethic, according to Levy, states: ‘Access to computers – and anything which might teach you something about the way the world works - should be unlimited and total. Always yield to the Hands-On Imperative!’ (Levy 2001, 40). And he explicates: ‘Hackers believe that essential lessons can be learned about the systems – about the world – from taking things apart, seeing how they work, and using this knowledge to create new and even more interesting things. They resent any person, physical barrier, or law that tries to keep them from doing this’ (ibid.). Levy stresses the importance of what Stiegler emphasizes as the knowledge and know how [*savoir-faire*] that is the essential component of non-proletarianized production and that precisely disappears with proletarianisation. The hacker ethic, it could be said, is an ethic of non-proletarianisation. Also, in his description of the hacker ethic as the new work ethic for the information age, Himanen writes that its central values are: *passion* (or intrinsic interest in the work one does), *freedom*, *openness*, *creativity* and *caring* (Himanen 2001, 139-142). These are all values that can only be upheld within a non-proletarianised setting.

Now Stiegler and his co-workers from the Ars Industrialis association argue that free software, and to a lesser extent also open source, can be understood in terms of a process of deproletarianisation (Stiegler 2010c, 85ff). The FSM of course strives for a non-proprietary, commons-based innovation ecology in the world of software but from a more fundamental perspective, it represents a battle against what Stiegler calls ‘the proletarianisation of the cognitive’ which is the principal logic of so-called cognitive capitalism and which exploits people’s cognitive (as well as affective) capacities for exclusively economic purposes, thereby alienating them from their knowledge and know how and ultimately destroying it, destroying their cognitive capacities with it. Proponents of free software refuse to be reduced to simple *users* of software designed elsewhere and imposed solely for the purpose of supporting economic exchange. They want to be able to design their own software, to be not just users but also designers of software, and therefore to be able to create – as a community - their own technical milieu. The want to be *practicians* of software and computer technology, not just consumers. From a free software perspective, the very opposition between producers and consumers should disappear. For Stiegler, the FSM, being not only a technological, but also a social, a political and economic movement, represents the first stirring of a ‘pharmacological turn’ in the context of software and the digital information and communication technologies, i.e., a collective attempt to reappropriate these technologies and transform them from closed, proletarianizing technologies of control into open, deproletarianizing technologies of psychic and collective individuation, in order to re-create the infotechnical milieu as an associated milieu, in which the technical system individuates in concert with the psyches and the collective.

movement, however, non-free software is a social problem, and moving to free software is the solution’ (Stallman 2002, 57).

12. DEPROLETARIANIZATION AND OPEN SOURCE BIOTECHNOLOGY

The introduction of open source – and in the future maybe ‘free biology - in the context of agriculture, I suggest, should also be understood and studied from the perspective of deproletarianization. Although still predominantly examined from a juridical perspective, as an issue of intellectual property legislation, the phenomenon of open source biotech should be more thoroughly analyzed as a question of political economics, and of politics as well. The ‘repossession’ of the means of production through the creation of a ‘protected commons’ that is indeed the most laudable goal of all the biological open source projects initiated at the moment, as Kloppenburg shows (Kloppenburg 2010, 375), is an effort to reappropriate en re-autonomize the knowledge production and know how that is continuously expropriated from farmers with a view to restore this knowledge and know how at the psychocollective level and so to regain their ability to participate in the transformation of their own technical milieu and its modes of production, and as such to become the creators and authors again of their own lifeworlds and their own existence - and to be able to take care and responsibility for it²⁸. Open source could be the first vital step in the transformation of the new biotechnical *pharmaka* from corporate biotechnologies of control-from-the-outside into commonly-owned biotechnologies enabling a caring and more intelligent agriculture, endogenously ‘controlled-from-within’ - agriculture as a genuine system of care.

If we look at the statements, for instance, of the BiOS initiative of the Australia-based nonprofit organization CAMBIA, the brainchild of Richard Jefferson, we can observe that its implicit aim lies in a global deproletarianization of agriculture. Its diagnosis of corporate-led agriculture (agribusiness) is that the grave social and ecological failures it has engendered are due to the fact that it has uncoupled agricultural innovation from the social en environmental systems in which it operates and that it does not (not sufficiently) engage the imagination and commitment of people and societies in the process of innovation. CAMBIA-BiOS want to opposed this trend by instituting an ‘innovation ecosystem’ in which research and problem solving is democratized and decentralized. It strives for the creation – through its open source licensing strategy - of a protected ‘commons of technology’, conceived as a ‘true public commons of capability’ (Jefferson 2006, 35). Its ‘3-D philosophy’ of innovation – Democratization, Decentralization and Diversification – also implicitly aims at reconstituting agricultural systems as associative technical milieus in which the short-circuiting of farmers is undone with.

The new *pharmaka* that are the tools of biotechnology are at present poisoning agriculture as a system of care, but, as Jefferson stresses, ‘this does not have to be’ (ibid., 40). They can be re-appropriated and redesigned to constitute the new therapeutics for another, radically renovated yet non-proletarianized agri-culture.

²⁸ Kloppenburg mainly writes about this reappropriation in terms of the regaining of *food sovereignty* by farmers, in particular indigenous farmers (Kloppenburg 2010).

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