Bernard Stiegler on Agricultural Innovation

Pieter Lemmens, PhD
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Radboud University, Nijmegen, The Netherlands
Correspondence: Pieter Lemmens, Radboud University, Nijmegen, The Netherlands E-mail: p.lemmens@science.ru.nl

Abstract
According to Bernard Stiegler's theory of techno-evolution, technologies have an intrinsically pharmacological nature. This means that they are simultaneously supportive and destructive for sociotechnical practices based on them. Technological innovations always first disrupt existing sociotechnical practices, but can and should then always be 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, agriculture is necessarily a system of care. Current deployment of transgenic technologies under capitalist conditions induce processes of proletarianization in agriculture, which has led to their widespread rejection. However, they can and should become the basis of a new system of care, but only under the condition that they are wrought from corporate control and redeployed to initiate a process of deproletarianization.

Keywords: agriculture, biotechnology, innovation, genetic engineering, farmers

1. Introduction

This short article discusses the relevance of the work of the French philosopher of technology Bernard Stiegler (1952) for addressing techno-ethical and techno-political issues in agricultural innovation, in particular regarding the use of genetic engineering technologies. Before specifically dealing with his work on agriculture and agricultural innovation, the article wil first provide a short introduction to the broader scope of his work and to the most important aspects of his view on technology and technological change. It will then focus on his theory of agriculture as a technical system as seen from his more encompassing view on the co-evolution of humanity and technology. Emphasis is laid on his notion of proletarianization and the way it affects farmers and peasants all over the world due to the corporate-controlled deployment of genetic engineering technologies in industrialized agriculture. Also discussed is Stiegler's main theoretical insight that technologies must be considered as *pharmaka*, which means that they can *both* obstruct *and* advance the psychic and social individuation processes involved in the sociotechnical practices they support and can do so simultaneously. Given their pharmacological nature like any other technology, genetic engineering technologies can and should be re-deployed as tools to reverse the process of proletarianization and institute a new system of agriculture where farmers regain their lost ability to participate in the innovation processes and therefore the evolution of the technical milieu that constitutes their existence.

2. Main Philosophical Ideas

2.1 Human Individuation and the Technical Milieu

Stiegler's philosophy of technology and technological change is rooted in a philosophical-anthropological conception of man. The premise of his thinking is that man is fundamentally characterized by what he calls an 'original lack of origin' [*défaut d'origine*]. In contrast to animals, man is a being that is 'substantially without essence', i.e., a creature with no intrinsic or natural qualities. The proprium of man consists in his thoroughly accidental character and precisely for that reason the human condition is essentiallly the condition of technicity. In contrast to the metaphysical tradition unto Heidegger, Stiegler claims that man is a prosthetic being by essence (Stiegler, 2009b). Man's temporal and historical mode of being, i.e., his involvement in a process of permanent becoming, is grounded in the original default.

Stiegler understands the structurally incomplete, technically constituted and conditioned process of becoming characteristic of man on the basis of the theory of individuation developed by French philosopher of technology Gilbert Simondon. Crucial in this theory is that individuals do not precede the process of their individuation, which means that there is no fixed principle of individuality. According to Simondon, psychic individuals can individuate only within and relative to a collective, as a process of psycho-collective co-individuation. Stiegler adds a third term to this model: technology or the process of technical individuation (Stiegler, 2007). The human individuation process therefore involves not two but three terms, and it is the third term, that of the individuation of the technical system or technical milieu, that possesses a certain primacy, since technical innovation is the initiating factor in the typically human process of individuation (Stiegler, 2009c). This does not mean, to be sure, that technology would be 'a-social' in the sense that it would externally determine processes of psycho-collective individuation, yet it 'over-determines' them in the sense of conditioning them.

The technical system is the pre-individual milieu (also a term of Simondon) which allows the articulation of the individual psyches and the collective in the first place, but is also formed through the process of psycho-collective co-individuation. The relation between psyches, collectives and the technical milieu is *transductive*, meaning a relationship in which the constituting terms co-constitute each-other and only take shape in their relationship to each other. Stiegler speaks here of 'organs' and calls the study of the ever-changing relations throughout history between psychic organs, social organ-izations and the artificial organs of the technical milieu 'general organology', an extension of Simondon's notion of mechanology (Stiegler, 2013).

The articulation of the processes of psychic individuation with the processes of collective individuation through the technical milieu constitutes a process of 'transindividuation' that results in the formation of the 'transindividual' (once again a term of Simondon). This comprises everything that is shared by all individuals and meta-stabilizes itself in a certain way in the form of culture, language, customs, modes of production, social rules, moral principles and so on. The pre-individual milieu is both the product and the process of trans-individuation and the condition of the processes of psychic and collective individuation (Stiegler, 2007). It includes techniques that act as external memory supports,

initially only implicitly, but with the emergence of so-called 'mnemotechniques' like writing explicitly. It is constantly evolving, from clay tablets, papyrus, parchment and the printing press to radio, television, cinema, and the Internet. This means that the human is principally characterized by the adoption of always new technologies (Stiegler, 2009a).

2.2 Techno-evolution and Epiphylogenesis

Stiegler also theorizes technology and technological change from an evolutionary perspective on the human as a technical lifeform. He shows that human evolution is essentially a techno-evolution, i.e., the process of anthropogenesis is fundamentally technogenic. Techniques act as external memories that are unique to the human species. What constitutes the humanity of the human and differentiates humans from other animals is a process of technical exteriorization, as Stiegler claims with French archaeologist and paleoanthropologist André Leroi-Gourhan. Human evolution is based on the transmission and accumulation of external, artificial memory supports that have initiated an entirely new process of evolutionary differentiation operating outside of the biological organism, i.e., not of genetic differentiation, but differentiation of technical prostheses, that nevertheless permanently interact with human biology (Stiegler, 1998).

Human culture, tradition, spirit, etc., are ultimately based on the very possibility of inheritance of technical artifacts that act as memory traces, i.e., as material carriers of exteriorized experience (Stiegler, 2004a). The process of hominization, then, *is* the process of technical exteriorization (and its subsequent interiorization). Stiegler calls the third, technical type of memory that is unique to humans epiphylogenetic memory and the process of evolution based on it epyhylogenesis, since it involves the transmission of individual (epi-) experience to the species (phylo-) (Stiegler, 1998). Anthropogenesis and human history can be described as a process of epiphylogenesis. In this process different stages or epochs can be distinguished. Each epiphylogenetic epoch makes certain forms of knowledge and experience possible. It provides the technological conditions of possibility for thinking and being in a certain period and structures as such what Heidegger thought of as the epochality of history. It includes both artifacts and symbols. Language and technology are two equiprimordial dimensions of the same process of exteriorization on which the evolution of man essentially rests (Stiegler, 2004a).

2.3 Stiegler's Pharmacological Conception of Technology

What sets Stiegler apart from most other philosophers is his emphasis on the fact that human existence is essentially technically constituted and conditioned, which implies, among other things, that human autonomy cannot exist without heteronomy (Stiegler, 2013). In his most recent work he lays increasing emphasis on the fact that any technology, but in particular mnemotechnology, has the character of what he calls (after his teacher Derrida, who borrowed this term from Plato) a *pharmakon* (ibid.). This Greek word means both medicine and poison, in the sense of that which can both heal and make us sick. That is to say, technology functions for humans - as the animal that is fundamentally open and indeterminate and therefore in essential need of prostheses - simultaneously as that which 'comes to the rescue' of his indeterminacy in the sense of compensating for it, 'curing' it as it were, and as that which can

'poison' this indeterminacy, acting as a barrier to his freedom and thereby undermining his existence and world-disclosive capacity rather than supporting it.

In the case of mnemotechniques, this means that they can both elevate and frustrate the mind, that they can lead to both subjectivation and desubjectification and can be employed for emancipation and individuation as well as disciplining and disindividuation of the mind. In Foucaultian terms: they can act both as technologies of power and as technologies of the self. They can enhance autonomy and sociality but also heteronomize subjects and atomize societies. What is crucial is that technologies and the technical systems they constitute are in need of practices of care. As supported by a system of *pharmaka*, each culture is therefore necessarily a system of care: care *for* and *through* the *pharmaka* (ibid.).

Processes of individuation and subjectivation are crucially, and from the very outset, pharmacological in nature and the human being – as a being without origin – is a substantially pharmacological being. Fighting against the toxifying tendencies within the technical milieu of the mind presupposes that philosophy develops a critical pharmacology of technology. One of the technical milieus that is suffering from toxification due principally to the capitalist employment of the new and emerging *pharmaka* that enable its revolutionization is the global agricultural system.

3. Stiegler's View on Agricultural Innovation

3.1 Agriculture as Technical System and System of Care

Throughout its evolution and history, humans have always had to adopt new technologies, i.e., new technical systems. The arrival of a new technical system however, as Stiegler shows following the French historian of technology Bertrand Gille, always causes a disruption in the social system, suspending and actually destroying the system of care based on the preceding set of technologies and the skills evolved around them (Stiegler, 2009b). Initially, then, technological revolutions are destructive of ways of life and modes of existence. They bring about a maladjustment between the technical system and the social system, giving rise to a fundamental disorientation. Only by adjusting itself to the new technical system can the social system 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 - i.e., biotechnology, in particular the technologies that can manipulate life on the molecular level, which may destroy traditional lives of farmers all over the world. They also embody the possibility, though, of a new agriculture.

Like all culture, agriculture is a system of care (Stiegler, 2007). This is to say that it is a kind of therapeutic (from the Greek word *therapeuein*: to care, to take care of) in the sense that the practice of agriculture as the cultivation of (vegetable) life and, with it, the creation of artificial ecosystems, always entails a violation of the natural world, i.e., a disequilibration and disruption of ecological balances.Traditional Farmers are those who take care for the living and this always means selecting the living through technics. As a technically equipped and educated selector-cultivator, the traditional farmer is not simply a reproducer but also a producer of life. He breeds new life, new varieties, and in doing so he also transforms his own way of life, i.e., his world. In domesticating plants (and animals), the traditional farmer also

domesticates (in the sense of elevating) himself. And in transforming the world, in forming a new world, he must take care of this world and this taking care, as the very essence of agriculture, is a therapeutics that involves techniques which have essentially the character of *pharmaka* and necessarily involve knowledge, i.e., the knowhow [*savoir-faire*], skills and expertise based on these technologies. It is in particular this knowhow that 'makes the farmer', that constitutes his way of life, that is to say his existence.

The appearance of a new technical system always involves the appearance of a new kind of society and new social roles, i.e, a new modality of the process of psychic and collective individuation based engendered by a novel process of technical individuation (ibid.). Agricultural systems must also be understood as processes of such a kind, involving a common technological base and a variety of socio-technical roles. Agriculture actually entails a fourth process of individuation as well, which is the process of vital individuation of the plants and it can be argued that agriculture is centred around the care for, and the technical improvement of, processes of vital individuation of crops. What distinguishes contemporary agriculture from traditional agriculture is the fact that today it has become possible to directly intervene in these processes of vital individuation. This enables both a proletarianization of agricultural innovation, as currently happens predominantly, but it can also become the basis of a new mode of agriculture, which supposes a process of deproletarianization.

3.2 The Biotechnology Revolution and the Corporate Control of Agriculture

At the moment, we are in the midst of a huge rupture in the technological base of agriculture, particularly due to the new genetic engineering technologies that enable intervention in the very processes underlying the development and evolution of life. With these technologies becoming prevalent, the care and responsibility for the living is more and more transferred from farmers to biotechnologists. This could in principle lead to fruitful cooperations and to a sharing of responsibilities, but the problem is that today these technologies are everywhere turned into private property by the big agrotech multinationals with the principal aim of acquiring monopolies and ensuring profits, not of providing farmers with new innovative breeding tools.

Corporate control of these technologies represents the biggest threat to the knowhow of farmers and tothe 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). This process of proletarianization of the farmer allows for the exploitation of his labor force but what is even more troubling for Stiegler, is the fact that this proletarianization involves a reduction of the existence of the farmer to the level of subsistence, substituting a mode of living with a mode of employment. Reduced to a subsistence mode of living, farmers lose the knowledge and knowhow through which they have always exercised their care and responsibility for the living. 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. It replaces it instead with a systemic carelessness and a complete absence of responsibility.

3.3 The Proletarianization of the Farmer and the Ruining of Agriculture as a System of Care

From the perspective of Simondon, taken over by Stiegler, the proletarian is the one who, dispossessed of the means of production and turned into a unit of labor power, has lost his knowhow and it is in this that the real, and most problematic essence of proletarianization consists (Stiegler 2010a). 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 broadly through their way of life, their *savoir-vivre*. And it is this care and responsibility, which elevates them above subsistence level and makes them into existent human beings, that farmers all over the world do not want to lose.

The new genetic engineering technologies enable an expropriation of the most important and most central means of production in agriculture (the seed) through appropriation of the germ plasm. This implies an expropriation of the knowhow and knowledge of farmers and turns them 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 functioning as employees for big corporations. Farmer's modes of existence are in fact short-circuited and thereby made obsolete through these new technologies (Stiegler, 2007). 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 (Stiegler, 2010a).

Rejection of the privatization and corporatization of agriculture goes often hand in hand with an outright rejection of genetic engineering technology as such. However, the introduction of these technologies in agriculture does not necessarily imply their proletarianizing—and therefore careless and irresponsible—deployment by capitalism. They can be (re)possessed and (re)appropriated by farmers and turned into new tools for taking care and responsibility, tools for a new, thoroughly 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. What should be rejected is the proletarianizing ways in which they are put to use.

Stiegler's thesis is that grammatization, the discretization and formalization of the continuous flows of natural processes that enable their exteriorization (Stiegler, 2004b), is the principal factor behind proletarianization, that is to say: its condition of possibility (ibid.). This grammatization of life in fact enables the short-circuiting of the process of reproduction of living organisms 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 these organisms (and as selectors also with their production, i.e. with the creation of new life): the farmers. This actually makes the traditional lives of farmers obsolete, proletarianizing their mode of existence. The upshot of this is a loss of participation of the farmers in the development of their 'own' technical milieu, that is to say: in the very 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. Ultimately agriculture as a system of care collapses. What is needed

is a reversal of this process, i.e., a process of deproletarianization, and this can only come about as a therapeutic based on the very same technologies that are at the basis of proletarianization (Stiegler, 2013).

3.4 Deproletarianization and the Pharmacological Turn

As Stiegler contends, 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, they can both support and undermine psychosocial individuation processes. 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 Stiegler theorizes technologies fundamentally as *pharmaka* (Stiegler 2010b). As already mentioned, technologies as *pharmaka* can simultaneously 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*, and that is by developing new practices around and on the basis of these *pharmaka*, i.e., practices of care (Stiegler, 2007).

This pharmacological view of technology is anything but a refashioning of the traditional idea of the neutrality of technology. On the contrary, the fact that technology *conditions* any process of individuation in a pharmacological way implies that psyches and collectives cannot 'use' or 'apply' technologies as they see fit from an autonomous and sovereign subjective standpoint. Instead, they have to *negotiate* with this condition as that which is foundational to their practices and can, as such, both support and undermine these practices. On the other hand, the fact that technologies condition processes of individuation does not rule out that they can be redesigned by 'users' to support new and alternative 'applications'. That which ultimately 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, an economic practice to be sure, but one in which care is the ultimate value of the valorization process. This restores, according to Stiegler, the original sense of the word economy, as 'to economize' originally means to take care (Stiegler, 2013). Without a practice of care, *pharmaka* 'support' proletarianization, which means the absence of any practice and the exclusion of the user from participation in the evolution of the technical system which he depends on nevertheless.

Now, what the privatization and thus desocialization of the new biotechnologies by the big agrotech companies precisely prevents, is the formation of such practices of care around these technologies. The processes of innovation in agriculture are everywhere privatised and put under control—ultimately—of finance capitalism, short-circuiting the farmers as selectors—i.e., destroying the processes of psychocollective individuation and inducing dissociative, care-less milieus deprived of the possibility of responsible action.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 *as* corporations—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, especially in the light of the global environmental and food crises.

The impending proletarianization of agriculture, made possible by and implemented through biotechnology, needs to be countered with a resolute project of deproletarianization, that is to say: 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. To prevent a rampant decline of agriculture into agribusiness and to allow for the possibility of reconstituting agriculture as a system of care, one needs 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 psycho-collective individuation based on the sharing of knowledge and knowhow (Kloppenburg 2010).

The first steps towards repossession and deproletarianization, as Lemmens (Lemmens, 2014) has argued, may already be on the horizon with the introduction of the principles of open source innovation in the agricultural context. Open source innovation, which originated the world of software development, not only involves a 'repossession'of the means of production through the creation of a 'protected commons' (Kloppenburg, 2010), but also an effort to re-autonomize the knowledge production and creation of knowhow that is continuously expropriated from farmers with a view to restore this knowledge and knowhow at the psycho-collective level and so to regain the 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 it. Open source may 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', that is to say agriculture as a genuine system of care (ibid.).This might as well lead, eventually, to a trajectory of agricultural innovation that deviates from the dominant tendency of increasing biotechnologization. However, from Stiegler's perspective – and considered as a phase within the history of grammatization – biotechnology appears as something that is here to stay. Its ultimate destination, however, is anything but decided and will depend on the ways in which it will be adopted by social actors.

References

Kloppenburg, J. (1988). *First the seed. The political economy of plant biotechnology*.

Madison: The University of Wisconsin Press.
Kloppenburg, J. (2010). Impeding dispossession, enabling repossession: Biological open source and the recovery of seed sovereignty. *Journal of Agrarian Change, 10*, 367-388. http://dx.doi.org/10.1111/j.1471-0366.2010.00275.x
Lemmens, P. (2014). Re-Taking Care. Open Source Biotech in Light of the Need to Deproletarianize Agricultural Innovation. *Journal of Agricultural and Environmental Ethics, 27*(1), 127-152. http://dx.doi.org/10.1007/s10806-013-9457-8
Stiegler, B. (1998). *Technics and time 1. The fault of epimetheus*. Stanford: Stanford University Press.
Stiegler, B. (2004a). *Philosopher par accident. Entretiens avec Élie During*. Paris: Éditions Galilée.
Stiegler, B. (2004b*). De la misère symbolique. L'Époque hyperindustrielle*. Paris: Éditions Galilée.
Stiegler, B. (2007). 'Zorg dragen. Landbouw en industrie'. *Ethische Perspectieven, 17*(3). http://dx.doi.org/10.2143/EPN.17.3.2023389
Stiegler, B. (2009a). *Acting out*. Stanford: Stanford University Press.
Stiegler, B. (2009b). *Technics and time 2. Disorientation*. Stanford: Stanford University Press.
Stiegler, B. (2010a). *For a new critique of political economy*. London: Polity Press.
Stiegler, B. (2010b). *Taking care of youth and the generations*. Stanford: Stanford University Press.
Stiegler, B. (2013). *What Makes Life Worth Living*. On Pharmacology. London: Polity Press.