Zeitschrift: Tsantsa : Zeitschrift der Schweizerischen Ethnologischen Gesellschaft = revue de la Société suisse d'ethnologie = rivista della Società svizzera d'etnologia

Herausgeber: Schweizerische Ethnologische Gesellschaft

Band: 20 (2015)

Artikel: Fools gold on the prairies : ontologies, farmers and their seeds

Autor: Müller, Birgit

DOI: https://doi.org/10.5169/seals-1007233

FOOLS GOLD ON THE PRAIRIES

Ontologies, Farmers and their Seeds

Text: *Birgit Müller*

Abstract

The «ontological turn» in anthropology is linked to the insight that environmental thinking requires reflecting on conflicting ways of «being and becoming in the world». This article explores how large-scale industrial farmers engage with the world, their ontic relationship with seeds, their direct reconnection to reality and sensorial perception of the non-human. However, seeds not only become what they are in multifarious networks of natural, cultural and political agencies, but their emergence and co-evolution with humans is ruptured through deregistration, persecution, confiscation and destruction. Proprietary industrial seed varieties carry instrumental rationality and control into the fields of Canadian farmers that are hard to resist.

Keywords: *Seeds; Intellectual property rights; Ontological turn; Prairie farmers*

The «ontological turn» in anthropology is linked to the insight that environmental thinking needs to reflect on conflicting ways of «being and becoming in the world»: ways of having, controlling and possessing the world as well as co-creating, dwelling and living within it. This discussion is important for human – seed relationships. What is more, how humans relate to their seeds shapes the entire food chain, determines the future of agriculture and ultimately human sustenance.

In this article, I will look at practices at the heart of the modernist project, at the co-evolution of large-scale grain farms in the Canadian prairies and their most important cash crop, canola, also called «the yellow gold of the prairies». I am interested in how large-scale industrial farmers engage with the world, their ontic relationship with seeds, their direct reconnection to reality and sensorial perception of the non-human. I am looking at their «being in touch with the warmness of things» as Theodor Adorno (1979:43) would say, and how this being-in-touch is transformed in the industrial farming system. The co-evolution between seeds and humans leads in the direction of an increasing heteronomy when seeds become the carriers of intellectual property rights and systems of oppression and control. Humans and seeds become alienated from the natural world when industrial seeds carry an instrumental rationality and control into the field of the farmers. But how do farmers perceive them, how do they interact with these plants that carry intellectual property rights into their fields? Moreover, seeds not only become what they are in multifarious networks of natural, cultural and political agencies, but their emergence and co-evolution with humans is ruptured through deregistration, persecution, confiscation and destruction of proprietary seeds.

In order to act on these mechanisms of appropriation and destruction it is thus not only necessary to engage with seeds in a «warm» relation of intimacy and love but also to acquire the first-hand experience of the mechanisms that destroy such warmth and a proximity to and intimate knowledge of

the matter at hand (Macdonald 2011: 680). Real autonomy, Adorno says, is dependent upon a process whereby consciousness experiences contradiction not as something meaningless, but rather as the force that propels it to think through and diagnose contradictions in order to overcome them (Adorno 1973: 17). To what extent do industrial farmers perceive these mechanisms of appropriation and destruction, and to what extent are they able to contradict them?

In the first part of this article, I will reflect on the relevance of debates about the ontological turn in social anthropology for the study of human – seed relationships. Then I examine how human – seed relationships were shaped through the instrumental rationality of modern farming and the legal and regulatory framework associated with them. Finally, I examine the types of relationships enthusiastic growers of transgenic canola establish with their plants. What I am trying to show is how the instrumental rationality of modern farming is also creating intimate, pre-objectual, highly emotional relationships between plants and humans that obscure their associated mechanisms of destruction and appropriation.

Seeds and the ontological turn in anthropology

Agricultural plants have been for thousands of years true companion species (Haraway 2003) for humans. They are natural living organisms in which humans have intervened, and they have thus coevolved with humans since the beginning of agriculture. They bear the traces of humans, but humans also bear the traces of their plants, not in the least because human bodies have to physically absorb plants in order to live. Their seeds have linked human labor to the living soils. Through seeds humans have established their sensorial relationship to the soil, to the plants as they grow and to the weather. They are objects of pleasure, urge, and need. Seeds stimulated human ingenuity and care and traveled with them to the remotest corners of this planet. So close is their relationship to humans that most agricultural plants can only reproduce and compete successfully if humans help them. Plants selected to keep their seeds are at a disadvantage to their wild, easily shelling competitors. Although alive and with an agentivity of their own, agricultural seeds and plants are nature that has been interfered with and that needs constant human work. Seeds are both a meaningful part of the daily practice of many people involved in agriculture and simultaneously mediators of power and control; they are carriers of national and international food and agriculture policies, and instruments for imposing corporate control in the field of the farmer. By exploring the concrete issue of human – seed relationships, I want to contribute to an anthropology sensitive to the complexities of lived experience, an anthropology that is attentive to a historically sophisticated political ecology attuned to difference and inequality, power and control.

Following Jan Patočka's (1998) three movements of human life – an affective movement toward the earth consisting of creating roots and engaging sensorially and emotionally with the world; an ascetic movement consisting of work and self-expansion, identified with the world of production and governance; and a reflective movement peculiar to the realization of human existence and linked to the future – I look at seeds as humans engage with them to help them grow, as they become the objects and carriers of government and technical assemblages, and as they help humans reflect on the state of the world and project themselves into the future. Through seeds, humans enter into multiple relationships with other humans, pursue objectives, calculate and plan. Seeds thus also belong to the domain of work, which is still part of the sphere of the earth (Patočka 1998) or of nature (Marx [1890] 1977: 43), but in which the instinctive, affective relationship gets suppressed and sometimes even forgotten. In the sphere of work, humans reproduce themselves, together with seeds, in cooperation or in conflict with other humans. As Patočka (1998: 150) pointed out, it is in the technological era in particular that the first instinctive movement toward the earth is overpowered by instrumental rationality. Seeds as human companions are powerful carriers of instrumental rationality. Governments attempt to control them because «they can be seen as a biothreat, an alien invader, and carrier of disease» (Aistara 2014). The seed system, though highly regulated in most countries, (from the release of new varieties and the quality control of seeds to the legal status of organizations that implement seed control and certification and variety release procedures; FAO 2010: 129), has become in many countries a way of surrendering control over industrial seeds to private corporations (Müller 2010).

Through the natural processes of seeds growing into plants, relationships of power and autonomy are established over, and among people. Intellectual property rights to seeds, and the rules of seed registration, have become the tools of multinational seed corporations for appropriating large parts of farmers' incomes and controlling the food chain. These rights allow seed corporations to shape the ways in which seeds can be sown, harvested, selected, replanted, and sold by producers globally. While various forms of public and private governance simultaneously push seeds toward homogenization, and agriculture toward industrialization, local legacies subsist and new practices emerge and spread. Through these processes powerful differences are created between

seeds that alienate the farmers and those that enhance diversity and resilience. Which types of seeds are grown, for food, fuel, or other purposes has to do with religious or political worldviews, with the skills of agricultural practice, and with massive financial interests. Seeds, whether transgenic, hybrid, or from traditional plant populations, become stakes for mobilization and lobbying that go beyond farmers and involve researchers, corporations, environmentalists, and consumers in varying ways.

Emerging multispecies ethnographies look at human «entanglements with other kinds of living selves» (Kohn 2007: 4). They focus on how a multitude of organisms' livelihoods shape and are shaped by political, economic, and cultural forces. As Kirksey and Helmreich pointed out, «[a]nimals, plants, fungi, and microbes once confined in anthropological accounts to the realm of *zoe* or ‹bare life› – that which is killable – have started to appear alongside humans in the realm of *bios* with legibly biographical and political lives» (Kirksey and Helmreich 2010: 545; Agamben 1998). This approach to «nonhuman» beings, influenced by Donna Haraway's concept of co-emergence of human beings living *with* other species, has led to a new sensitivity for interspecies communication involving a multisensory approach and an anthropological interest in different kinds of touch, smell, taste, and vision involved in the moments when species meet (Haraway 2008). In contrast with Carrithers and others (Carrithers et al. 2010), who refer to ontologies as «worldviews», I use the concept precisely because it allows us to go beyond the epistemic dimension. Against the cognitivist and transcendental cosmology of «constructed nature» (Ingold 2000), I propose an ontology founded on the immediate ontic «interagentive» engagement between humans and nonhumans based on their «dwelling» in the world. To fully understand these processes also requires the ontic engagement of the researcher.

Interspecies ethnography also meets with Eduardo Viveiros de Castro's «perspectival multi-naturalism», in which he posits that different kinds of persons, humans, and nonhumans that inhabit the same universe apprehend reality from distinct points of view (Viveiros de Castro 1998, 2012), generating only partially overlapping ontologies. While Viveiros de Castro emphasizes the fundamental difference between the Western or «modern» ontology and the pluralities of non-Western ontologies (Viveiros de Castro 2012), I follow Tim Ingold, who rejects the fundamental division between «the West and the rest» and maintains that much of the philosophical ammunition for the critique of so-called Western or modern thought comes straight out of the Western tradition itself. «Once we get to know people well, even the inhabitants of nominally Western countries – not one of them turns out to be a full-blooded Westerner; [...] the Western tradition of thought, closely examined, is as various, multivocal, historically changeable and contest-riven as any other.» (Ingold 2000: 63)

My analysis tries to avoid overused conceptions of farmers' knowledge and worldviews, marked by romanticist stereotypes and essentialism. It also questions the «simplistic opposition between farmers' knowledge and scientific knowledge that still prevails in the literature in ethnobiology and environmental anthropology» (Demeulenaere 2014). Different ontologies and different perceptions of being and coevolving with others in the world coexist, as I will show by looking at human-seed relationships in the midst of industrial agriculture. This multifaceted debate about the being of humans and nonhumans in the world has come to be called the «ontological turn» in social anthropology. This discussion is important for our subject for three reasons.

First, the ontological demand of an ontic serenity (*Gelassenheit*, Heidegger 1959) and patience (*Geduld*, Adorno 1973) characterizes a thinking that involves itself with what it has to think by letting itself be determined by it and thus dissolves the object / subject opposition. An ontic being and thinking describes a pre-categorical and pre-objectual connection to reality that stands in radical opposition to the calculating relations of humans to the world and to objects such as seeds, which humans attempt to violently seize in a techno-scientific manner (Guzzoni 2008: 136).

Second, the assertion of a shared relational frame of interaction between humans and nonhumans decenters the Western nature / culture distinction and associated notions of universalism and relativism (Halbmayer 2012: 9). It puts into perspective ontological dispositions present in the discourse of modernity that humans inhabit a social world of their own, over and above the world of nature and thus allows to think the co-emergence of humans and seeds. Seeds are «fellow participants in the same world, a world that is at once social and natural» (Ingold 2000:87) rather than a genetic resource at the disposal of humans. This is the approach that farmers' movements and seed savers' networks such as the Reseau Semences Paysannes (Demeulenaere 2014) are taking, accepting that seeds have their own agentivity and co-evolve with humans. A different co-evolution can of course also lead in the direction of an increasing heteronomy (*Entfremdung*) of humans and seeds when seeds become the carriers of intellectual property rights and systems of oppression and control (Müller 2006b).

Third, the debate poses the relation between self-determination and the ontological politics of collectives of humans that defend their own visions of the world and their right to inhabit

that world in a way that disrupts the globalizing project of constructing One World that is capitalist, liberal and secular (Escobar 2007; Blaser 2012). Saving seeds and allowing them to differentiate and evolve together with humans in their particular natural environments goes against the dominant paradigm of achieving total control over natural resources, be it through the extension of property rights or the omnipresence of regulations and standards. The farmers and activists contesting the dominant industrial food regime (Friedmann and McMichael 1989; McMichael 2013) seek to achieve a direct unmediated relationship to the seeds and the plants they help grow and to the food they produce. Not all of them explicitly claim the right to their own vision of and being in the world (Demeulenaere 2014), but they do claim to draw from the direct sensorial relationship to the seed and the soil, or the earth, as Patočka (1998) would have it, the energy and impulse to act and reflect on the technological constellations that are contained in the seed.

Tim Ingold's concept of dwelling (taken from Heidegger 1959) conveys how the perception that humans have of the environment is shaped by how they live in it and interact with it on an everyday basis. Ingold assumes that currently a global ontology of detachment dominates over local ontologies of engagement (Ingold 2000: 216). He considers that destructive human behaviour has its source in the very alienation of humanity from the world. Humans presume a world already constituted, through the action of natural forces, which then becomes the object of human interest and concern (Ingold 2000: 215). It is not a world of which humans themselves are conceived to be a part. However, by assuming the dwelling perspective it becomes possible to show how that clear-cut separation between those who dwell in their environment and those who are detached and alienated from it is more complicated. Also those who destroy the environment might subjectively feel they are perfectly in tune with it.

A Heideggerian *Gelassenheit*, in the sense of a meditation about the hidden meaning, the secret (*Geheimnis*) of the technical world (Heidegger 1959: 25-6) that unfolds is insufficient considering the existential problems that this world and the humans dwelling in it are facing. What interests me are the sources of engagement with the world, the ontic relationships between seeds and humans, the direct reconnection to reality, the sensorial perception of the nonhuman, Adorno's «being in touch with the warmth of things» (Adorno 1978: 43; Guzzoni 2008: 135). For Adorno, this direct intimate connection and the firsthand experience, not only of the warmth of things itself but of the mechanisms that destroy such warmth, is indispensable for restoring to autonomy its lived ethical substance (Macdonald 2011: 680; Adorno 1973: 226-232). In other words, for humans to engage critically with the world and become able to act, abstract moral law and rational thinking is not sufficient; such engagement requires first and foremost lived contact with the world damaged by instrumental rationality and the technological apparatus, as the following episode will show.

Property and power: Appropriation of seeds and control over the farmer

The spring and summer of 2010 had been exceptionally wet in Saskatchewan, so wet that farmers were unable to seed certain fields. Yet some fields were thickly covered with beautiful canola plants, «volunteers», which had germinated from the seeds that had fallen to the ground at last year's harvest. The weather was good, as was the price of canola. It was tempting to take the combine harvester and harvest this crop, which would be lower yielding than canola carefully seeded at uniform distances and depth, but which had cost nothing in inputs. However, hardly any farmer in the neighborhood dared to take this step. Although the land belonged to them and they had bought the seed the preceding year, they were afraid of intellectual property claims. Their canola varieties had been bred to be resistant to herbicide sold with the seed that can then be sprayed post-germination to selectively kill weeds[1], and most of them were hybrids[2]. Almost all canola in western Canada belongs to one of three herbicide-tolerant varieties: Monsanto's Roundup Ready, Bayer Crop Science's LibertyLink, and BASF's Clearfield are all cultivated under «stewardship» contracts that prevent the farmers from reseeding the crop.

The emblematic court case in which Monsanto accused the Saskatchewan farmer Percy Schmeiser of patent infringement served as a threat to the farmers in the area. In

[1] The first of these canola varieties was genetically modified to tolerate Roundup, an herbicide manufactured by Monsanto. The herbicide tolerance in the two other varieties, LibertyLink and Clearfield, has been produced through a process of mutagenesis. All require stewardship contracts, and the proprietary herbicides to which they are resistant are only sold to farmers who have signed it. To quote from the Bayer website: «Growers will need to sign a one-time Liberty & Trait Agreement (LTA) contract and be assigned an LTA number before purchasing Liberty® herbicide and / or LibertyLink® canola, such as InVigor®.» See http://www.cropscience.bayer.ca/en/Products/Seed-Treatments/Prosper.aspx, accessed December 2, 2013).

[2] A hybrid plant is a cross of two pure parent lines that will not breed true, that is, it will not have the same characteristics if the plant is reproduced in the following generation.

1996, one year after transgenic herbicide-resistant canola varieties had been introduced, Schmeiser found herbicide-resistant canola plants in his field and reseeded the grains of these volunteers. Monsanto prosecuted him for patent infringement right up to the Supreme Court. The Supreme Court ruled in 2004 that the ownership of the patent over the herbicide-resistance gene conferred on Monsanto by extension of intellectual ownership over the seed and over the plants developing from them, wherever they occurred (Müller 2006a; van Dooren 2010). Patented transgenic canola volunteers were thus off-limits to the farmers, the owners of the fields where they were growing. Farmers had been effectively separated from the plants growing in their fields and lost control over what they could do in their fields. So why did almost all farmers in Saskatchewan choose to grow patented canola varieties?

To answer this question we first have to look at what had happened to the conventional varieties cultivated in the area prior to the arrival of the herbicide-resistant ones. In 2010, only one farmer in the entire neighborhood was harvesting canola volunteers without restrictions. The canola that had emerged in the patches he had not been able to seed in the spring was of the open-pollinating unpatented non-GM sort. When I talked to this farmer, whom I will call Thomas Brown, and who was a leading activist of the National Farmers Union, he explained that this canola variety was the last of its kind inscribed in the national registry of plant varieties. He grew it to avoid contract agreements with seed companies. He would have preferred to continue growing a variety called Ebony, another conventional variety, but its breeder had recently deregistered it. It was now risky to grow, as the grain companies could refuse any variety at delivery that was not inscribed in the variety registry. His preferred variety Ebony had had few green kernels at harvest, a good resistance against the fungal disease black leg, a high oil content, and did not fall over easily when ripe. When Thomas sent this canola crop to the seed cleaner to be cleaned from weeds' seeds, the kernels of this variety were so big that standard seed cleaning equipment often eliminated («scalped») the largest ones. Although his preferred variety Ebony was slow starting compared to his neighbors' expensive GM varieties, it had often outperformed them at harvest. To keep it free from contamination with transgenic canola, he had set aside an entire bin for seed and had reseeded continuously the harvest from certified seed bought in 1997, renewing his seed stock from time to time by growing a crop for seed in a secluded spot far from the pollen flow from neighbors' fields seeded with GM canola.

For Thomas, losing this variety meant losing part of his autonomy as a farmer. He was no longer able to produce the variety best adapted to his land and became dependent for his production method on the whim of the breeder of the last conventional variety, who could legally deregister it at any time. Holding on to the last non-patented canola variety meant fighting alienation and dispossession from the object of his labor. As Karl Marx explains, «[t]he object of labour is ... the *objectification of man's species-life*: for he duplicates himself not only, as in consciousness, intellectually, but also actively, in reality, and therefore he sees himself in a world that he has created.» (emphasis in the original, Marx 1932) Underlying Marxist theory is an agrarian discourse that emphasizes human dependence on and co-creation of the environment and suggests that humans and nature form a single «body» (Marx [1884] 1959: 275; Pálsson 2009: 297). In tearing away from man the object of his production, here the seed, man is estranged from his own body, as well as from external nature and his spiritual aspect, his *human* aspect (Marx [1884] 1959: 275). This estrangement meant concretely for the farmer that his skill and judgment were invalidated and his caring relationship to the seed ruptured.

Aware of this threat, Thomas tried to find the breeder who had registered the Ebony canola variety and thus the reasons for its deregistration. The result of his quest showed the limits of the autonomy of the breeders and the global interconnectedness of the seed trade. Ebony was developed and registered in 1994 by a seed breeder working for the Canadian subsidiary of the large French cooperative Limagrain, who applied for plant breeders' rights over Ebony in Canada. As part of a strategy to increase its control over smaller seed companies, the multinational corporation Monsanto bought Limagrain Canada Seeds, Inc., in 2001. The purchase provided them with «assets that include quality canola germplasm, license agreements, a canola breeding program, current and future canola varieties, and a group of dedicated employees»[3]. Plant breeders were thus «traded» together with the company, carrying their plant breeders' rights with them. One of these «dedicated employees» was the breeder who had developed Ebony and under whose name it was registered. Before the plant breeders' rights over Ebony could expire and Ebony fall into the public domain[4], Monsanto instructed its breeder

[3] See http://www.seedquest.com/News/releases/europe/Limagrain/n3634.htm, accessed November 13, 2013.

[4] The Ebony canola variety would have fallen into the public domain in 2012, when the plant breeders' right attached to it expired. A plant that falls into the public domain can be grown freely, its seeds can be grown and sold as long as the variety remains in the official seed catalogue.

to deregister Ebony in Canada, thus withdrawing one more competitor to its patented transgenic varieties from the market. Ebony was subsequently re-registered by Monsanto in Australia with a proprietary gene inserted in it[5].

When Thomas talked to the Ebony breeder and told him that he would be ready to care for the variety and re-register it, the breeder was pleased but told him that it was impossible, as Ebony was now the «private property» of Monsanto. This claim to the deregistered seed variety as private property had at the time no legal backing, but was part of a legal limbo created by the progressive privatization of seed registration and testing and the statutory separation between plant breeders, allowed to register varieties, and farmers, confined to the status of «users» or «customers», as they were called in the documents of the Seed Sector Review. By deregistering old varieties that were about to fall into the public domain, companies evaded competition from varieties that were not genetically engineered and thus had no patent attached to them. As Thomas put it: «The seed has become a vehicle of exploitation. It's supposed to be now, under the current philosophy, a profit centre for private industry and actually the public institutions that remain. The general well-being of the agriculture community, the farm community and the economy of the country as a whole, is secondary to the profit» (Interview 2008).

Farmers could no longer rave about the kernel size of Ebony or the yield of Garrison, and they hardly remembered the letters and numbers of the new GM varieties they were growing. As a matter of fact, most farmers rarely even planted the same variety of canola from one year to the next.

Instrumental rationality and the intimacies of farming

Transgenic canola varieties are the typical «hybrids of modernity» (Latour 1993). The regime of selecting, categorizing, and authorizing them is involved in the simultaneous production of the two categories of «nature» and «humans / culture» between which a cut is made. In Latour's terms, an act of *purification* is being performed when seeds are classified, in which «nature» is being divided off from «culture» to produce two pure realms (which exist only in abstraction). These acts of purification have their logical counterpart in *translations*, in which the purified categories inevitably end up (re)mixing (Haraway 1997; Latour 1993). One of these translations occurs in the application for intellectual property rights on seeds, as Thom van Dooren explains:

«In the case of patenting seeds, an act of *purification* must be performed so as to present agricultural biodiversity as the kind of nature that does not include humans and their projects. This nature can then be utilised as a ‹raw input› into breeding programs (*translation*), the result of which is proprietary seed, *which can become property purely because it now appears to be a hybrid in which culture has been added to nature*» (emphasis in the original, van Dooren 2008).

In a farmer's field, the artificial separation dissolves and canola seeds become again historical organisms, which are at the same time part of the realm of the living, as they grow and reproduce, and artifacts intervened on by plant breeders, geneticists, and bureaucrats. Farmers don't grow plants; they help plants grow. «The work of the farmer or herdsman does not *make* crops or livestock, but rather serves to set up certain conditions of development within which plants and animals take on their particular forms and behavioral disposition» (Ingold 2000: 76).

At the same time that farmers set up certain conditions for the development of plants, the seeds they help grow into plants set up certain conditions for the farmers. Their capacity to germinate, to defend themselves against fungi and pests, and to grow into plants that ripen in time, stand up, and do not loose their kernels determine the yield the farmer will obtain, the ease with which they can harvest it. Transgenic canola seeds, however, not only have the agronomic characteristics to be resistant to herbicides, but they also have intellectual property rights, phytosanitary regulations, and classifications attached to them. Interacting with these seeds creates fields of property and power, situations of possibility and impossibility, in which the farmers and breeders cooperate with plants in complex biosocial networks that also include regulators, investors, and consumers.

The instrumental rationality contained in the imposition of intellectual property rights over seeds (Müller 2006a, 2006b, 2008) establishes fields of ownership that crosscut and contradict property rights over land and labor. If we use Michel Foucault's (2004) definition of a relationship of power as an action on the action of others, we can say that through

[5] See page 3 of the Australian license application at http://www.ogtr.gov.au/internet/ogtr/publishing.nsf/content/dir105-3/$FILE/dir105appsum.pdf, accessed November 13, 2013. If Monsanto would have wanted to reregister Ebony in Canada, they would not have been able to claim plant breeders rights, as only they could only get PBRs for plants that were distinct (from previously registered varieties), uniform and stable.

their intellectual property rights the firm owning the patent over a gene in the seeds has become able to act on the actions of the farmers via the seeds it sells to them. It determines what they harvest, how they sell it, whether they reseed their harvest, how they keep their books. As Karl Marx noted, «property signifies a relation of the working subject . . . to the conditions of his production» (1964: 95), and it is necessarily a political relation (Macfarlane 1998: 113). By attributing to the patent holder intellectual property rights over all the plants emerging from seeds carrying the proprietary gene no matter where they grow, the legislators extended the intellectual property right to take precedence over the right of property to the land and to the labor of the farmer. Intellectual property over seeds thus transforms and weakens freehold property upon whose foundation the liberal conception of a just society was based (Locke 1690: sec. 27). The farmers who reseed their crops become potential infringers, as laws against counterfeiting are currently extended to include the criminalization of seed saving[6]. The legal provisions equaling reseeding with counterfeiting are not only toughening on the national level, but also come to bear on international lawmaking through the intellectual property clauses of international trade and investment treaties[7] negotiated behind closed doors, which have legal precedence over national law in case of a trade challenge.

Transgenic canola seeds thus carry an instrumental rationality and control into the fields of farmers. To enforce a monopoly over a living, self-reproducing organism, however, is truly complex, and the biotechnology companies selling the seeds have pushed for numerous legislative changes that would allow them to use genetic testing to identify each seed delivered at the elevator or crushing plant, determine the holder of the intellectual property right over each grain shipped, collect royalties, and impose penalties on farmers whose grain shipments contain patented varieties that they have not previously declared (Müller 2008b). Traceability, which had become a master term after the food scandals of the 1990s, has thus surreptitiously changed its meaning to signify principally tracing intellectual property rights attached to the seeds cascading from the fields of the farmer to the vaults of large ocean liners.

Why then – to return to our question – did almost all farmers in Saskatchewan choose to grow patented canola varieties? How do they relate to the transgenic canola plants growing in their fields? Farming the prairies means being confronted with the extremes of nature: blizzards, tornados, hail storms and drought. The weather can change suddenly passing from soaring heat to severe frost in August. In spring, heavy winds can carry away the bare topsoil and sudden rainshowers fill the ditches with silt. Saskatchewan farmers have thus generally regarded their work as a fight *against* nature for which all the achievements of human inventiveness and science should be mobilized. No wild species or land varieties of the main cash crops exist in the prairies and as a consequence agricultural biodiversity is extremely low. Rapeseed, the predecessor of canola, like all main cash crops was imported from other parts of the world and adapted by the government funded agricultural research stations and the farmers themselves to the climatic conditions of the prairies. In the 1970s, public research institutes in Saskatchewan bred it to become a comestible crop. The introduction of agricultural chemicals for weed and pest control and the genetic modification of canola to become resistant to total herbicides has revolutionized prairie agriculture and facilitated the work of the farmer. High yielding varieties that respond to the input of fertilizers and are resistant to herbicides and pesticides are today commercialised by the main agro-chemical companies Monsanto, Syngenta, Dow Crop Sciences and Bayer that also sell the chemicals. In their advertisements they praise the ease with which their products allow the farmer to achieve, thanks to the highest level of technology, a clean homogeneous field in a safe green fertile landscape. A neat and tidy field and the immaculate lawn around the farmhouse are the status symbols for a successful farmer as they convey the impression of control over invasive weeds and menacing insects.

The landscape that the farmer-entrepreneur helped to create by practicing monoculture, by using sophisticated weed control with chemicals and by enlarging the areas cultivated seems to compel him to use more and more sophisticated means of control like global positioning systems (GPS) for efficient chemical application and biotechnology to become more independent of seasonal constraints. The heterogene-

---

[6] Canada was a member of UPOV (the International Union for the Protection of New Varieties of Plants) under the 1978 version, which does not restrict the right of farmers to reseed their crops. As I revise this article, Bill C-18 introducing UPOV 91 into Canadian law (Slomp 2014) has been passed on November 21, 2014. The bill makes reseeding a crop «a privilege» that the government can grant or withhold from the farmer, and it contains provisions that would make it illegal for farmers to stock seeds over several years. Selling «brown bagged» seeds to neighbours would become counterfeiting.

[7] A Comprehensive Economic and Trade Agreement (CETA) between Canada and the European Union is close to completion and contains paragraphs enforcing intellectual property rights which go beyond current Canadian (and European) laws.

ity of the *landscape* becomes abstracted to the quantitative category of the *land* (Ingold 2000), an asset that has to be increased to allow for «economies of scale».

I followed many Saskatchewan farmers into their fields and travelled for hours on their farm equipment while they seeded, fertilized, weeded and harvested their crops. When I went seeding GM canola with farmer Gerry Summer, his modern computer geared John Deer tractor with GPS pulled a long line of farm implements: an air-seeder with a row of disks in front and 1 inch wide shovels in the other rows and packers behind that, then an air tank with two compartments and an anhydrous ammonia tank. This long row of implements allowed to seed without working the field in uniform perfectly straight lines and to apply nitrogen fertilizer at the same time. During harvest the preceding year the board computer of the combine plus GPS had measured the yield of each part of the field and the data was transferred to the tractor computer that regulated the application of fertilizer accordingly. Before the small plants came up, Gerry applied glyphosate herbicide with a huge thirty-meter wide sprayer to reduce the competition from weeds. He had delegated the decision of how much nitrogen he was going to use to a laboratory that did soil tests and provided him with a computer simulation showing him how much fertilizer he had to put in to get an optimal result. He told me, that because he was «greedy» and wanted more yield, he went for the maximum. In spite of all the control and measuring implements he was surrounded by, he told me that farming had become a gamble that he lost more often than not. He blamed the state crop insurance that did not cover his costly inputs when the weather turned against him, cursed the corporations that drove him down the chute and raised his stakes every year. The intense relationship of passion and frustration that he experienced when he got caught in the spiral of high investments in new machines and costly inputs, seemed to increase the temptation to engage in even higher risk.

The invented time of the Taylorist factory regime invaded the field competing with natural growth cycles, and weather patterns. Every meter ploughed was counted and every kernel seeded per minute; board computers and GPS mounted on agricultural machines came to control the farmer and the ways in which he worked the land. It was not the use of machines as such that changed the relationship to the land and the seed, and that made the difference between self-determined or alienating work, but the way in which they were used. Once the control of the production point was taken over by the machine – or to adapt Marx, once the farmer ceased to use his tool or machine and the tool used him – then the alienation of the farmer from his natural environment took place. This happened in extreme ways, when the farmer tried to fulfil production contracts with agricultural corporations that obliged him to deliver a determinate amount of grain of a certain quality at a determinate moment. These contracts and the proprietary seeds linked to them brought the profit interests and quality standards of the firms directly into the tractor cabin.

Dudley (1994: 147) analyzing the rationale of US family farmers maintains that learning to farm is a lesson in the basic principles of a capitalist society. Not only is the market figured as inherently just – «if you work, you get reward», individual moral character is built by internalizing this logic. Dudley saw this as a positive effect on the moral character of the American people.

Bob Sand a successful younger farmer, one of the few that were actually without debt, would subscribe to her interpretation. He affirmed: those who put in the newest transgenic varieties and related agro chemicals «deserved to take out». He prided himself on having worked the market successfully, selling his crop at the right moment and using the latest machine technology, but bought second hand. Somewhat risk averse, he tried to contract as little credit as possible. When we went on a crop-tour, Bob explained how he prepared the land «as good as it gets» with chemical fertilizers, herbicides and fungicides. Highly emotional, as he described his experiences, he went from enthusiasm over the use of direct seeding methods to despair over broken stubble, low moisture and weeds. Bob pointed out to me erosion problems, crop diseases, weeds, and told me in detail all the chemicals he applied or thought he should have applied to get an optimal result. His production method hinged on the extensive use of broad spectrum herbicides, in particular glyphosate, which he sprayed on the mature crop to desiccate it, killing the weeds beneath it at the same time. He then seeded the next crop into the stubble of the preceding year, spraying the field with herbicide before the crop emerged. Another round of *Roundup* glyphosate was applied in-crop on herbicide resistant canola varieties. As I accompanied him on his crop-tour – inspecting the health of his crop – he explained:

«The whole Roundup-ready system for canola is a fabulous system, especially for guys who are growing a lot of canola. You can go out and spray in the spring and you don't have to worry about weed check or anything. All your problems are gone. You know how I was talking about this chemical killing this weed and that chemical only killing that weed, and what should you be using. There are lots of decisions to be made but with the Roundup ready you don't have to worry because it just kills them all. So this is good for farmers that have 10 000 acres and they have 4 000 acres in canola and the fields are all different – they just go and spray and it works good for them» (crop tour 2011).

The crop-tour was a moment of evaluation, and consequently self-evaluation, as the farmer judged the results of his efforts. It was thus a self-reflexive moment when he engaged on the one side in a sensorial touch with the soil and the plants and on the other tried to appreciate the amount of money and effort spent on the field and the outcome that he might expect. On this particular crop-tour three years ago, Bob was enthusiastic about the flexibility that the herbicide resistant canola allowed him and concerned about the widespread infection of his crop with fungi. He blamed himself for not having applied sufficiently strong fungicides. What did he see and know and how did he decide what to do?

Bob constantly pointed to the fact that his knowledge had evolved and that he would have told me – probably with the same enthusiasm – a totally different story about his technological choices ten years ago. This seems to confirm Tim Ingold's (2000) claim that a farmer regrows his skill each time he farms. To what extent did Bob enter into an active engagement with his surroundings and base his judgment upon that and to what extent did he disengage from it and submit to the authority of what he considered expert opinion? Who set his standards of evaluation and self-evaluation? When technological knowledge that is explicit and objective and can be taught in contexts outside of their practical application, and subjective, context dependent, practical knowledge meet in the field, what happens?

An abundant scientific literature mostly published by public researchers (Fernandez et al. 2009, Duke et al. 2013) has emerged showing the link between the excessive use of glyphosate and the explosion of fungal diseases because the action of glyphosate transforms the composition of microorganisms in the soil and prevents the uptake of essential trace minerals by the plants. Glyphosate remnants are detected in a large variety of food and links have been established between the exposure to glyphosate and increasing male sterility (Clair et al. 2012). These findings, which are mostly used by anti-GM activists and organic farmers were branded by pro-GM scientists as ideological and without scientific validity. An equally abundant literature advocates direct seeding, herbicide resistant GM crops and the use of herbicides as a means of combating erosion and of maintaining the soil structure (Cerdeira and Duke 2006). This latter scientific paradigm has huge financial interests attached to it and is promoted by all major agro-chemical corporations and most agricultural technicians. These two paradigms confronted each other thus unequally in the field of the farmer. Bob did not to take notice of any critical analysis of the effect of glyphosate that would have put into question his entire farming model of direct seeding. Although he still had an intimate knowledge of his plants, weeds and soils, (which many farmers have progressively lost to agricultural consultants), he did not consider the potentially noxious effect of the wide-spectrum herbicide. Also, he fundamentally trusted information coming from the most successful private corporations. His rational was: a technology would not survive market selection if it were not sound. Only the best survived on the market. Intimate knowledge of his crop and soils enticed him to act, but the direction of his choice was determined by his being-in-a-world of high technology and market powers, impervious to the rational weighing of scientific choices.

To compare the two farmers: Gerry Summer was alienated from his work as a farmer and had delegated control over his work to his board computer that was programmed by experts working for agricultural corporations. The guidance of his «working point» (Marx 1977) was thus externalized, «transferred from dexterous hands to a mechanism that is indifferent to its surroundings and answerable only to the instructions that have been fed into it in advance» (Ingold 2000: 300). He knew that he had put his fate in the hands of agricultural corporations and resented it. However, Bob Sand was still in control, he knew his fields intimately, was able to name every weed that grew in them, «cared» for his plants with a wide spectrum of chemicals and had a range of «situated skills» for the task at hand that made him feel very much at ease and «at home in the world» (Ingold 2000: 333). In spite of his feeling of perfection, however, his being-in-the-world was not harmonious, nor «stable» in the sense of movements equilibrating each other, as he was slowly poisoning the soils and the crops (and the humans who eat them), a problem he ignored.

Conclusion

The «bioethical complex» of regulatory agencies and professional organizations surreptitiously invades the field of the farmer. It controls, incites, monitors, and organizes seeds, as they are «developed and exploited by a range of commercial enterprises, sometimes in alliance with States, sometimes autonomous from them, establishing constitutive links between life, truth and value» (Rabinow and Rose 2006: 203). By exploring how industrial farmers are «being and becoming in the world», I wanted to find out how they become alienated from the natural environment, the soils and the plants they depend on. Attention to the ontic allowed me to go beyond the important Gramscian concept of hegemony as mass submission or consent to a dominant worldview (Crehan 2002), by showing the lived experience of being-in-a-world of high technology and market powers and the difficulties of stepping outside it to allow critical analysis.

Only a small number of farmers were able to resist its logic and tentacular grip. Out of the direct intimate connection to the seeds – Adorno's «warmth of things» – they drew the strength to question and resist the mechanisms that destroyed such warmth (Macdonald 2011: 680). It was not just the rational thinking about the world that made people act politically but their relationship to the warmth of things and the suffering about the loss of such warmth that stimulated political thinking and action. This helped to muster the courage for effective political action. It allowed experiencing the contradictions of industrial farming not as something meaningless, but rather as a force that propelled their consciousness to think through and diagnose contradictions in order to overcome them (Adorno 1973: 17). Thus, recognizing «the bioethical complex» as inherently political served as a critical apparatus that allowed those farmers to step beyond everyday practice into political engagement.

REFERENCES

Adorno Theodor W. 1978. *Minima Moralia*. London: Verso.

1973. *Negative dialectics*. London: Routledge.

Agamben Giorgio.
1998. *Homo sacer: Sovereign power and bare life*. Palo Alto, CA: Stanford University Press.

Aistara Gundra. 2014. «Actually existing tomatoes: Politics of memory, variety, and empire in Latvian struggles over seeds», in: Birgit Müller (ed.), Seeds – Grown, Governed and Contested. *Focaal. Journal of Global and Historical Anthropology* 69: 12-27.

Blaser Mario. 2012. «Ontology and indigeneity: On the political ontology of heterogeneous assemblages». *Cultural Geographies*. doi: 10.1177/1474474012462534, accessed January 12, 2013.

Carrithers Michael, Candea Matei, Sykes Karen, Holbraad Martin, Venkatesan Soumhya. 2010. «Ontology is Just Another Word for Culture. Motion Tabled at the 2008 Meeting of the Group for Debates in Anthropological Theory, University of Manchester». *Critique of Anthropology* 30(2): 152-200.

Cerdeira Antonio L., Duke Stephen O. 2006. «The Current Status and Environmental Impacts of Glyphosate-Resistant Crops: A Review». *Journal of Environmental Quality* 35: 163-1658.

Clair Émilie, Mesnage Robin, Travert Carine, Séralini Gilles-Éric. 2012. «A Glyphosate-Based Herbicide Induces Necrosis and Apoptosis in Mature Rat Testicular Cells in Vitro, and Testosterone Decrease at Lower Levels». *Toxicology in Vitro* 26(2): 269-79.

Crehan Kate. 2002. *Gramsci, Culture and Anthropology*. Berkeley: University of California Press.

Demeulenaere Elise. 2014. «A political ontology of seeds: the transformative frictions of a European farmers' movement», in: Birgit Müller (ed.), Seeds – Grown, Governed and Contested. *Focaal. Journal of Global and Historical Anthropology* 69: 45-61.

Dudley Marie Kathryn. 1994. *Debt and Dispossession*. Chicago: University of Chicago Press.

Duke Stephen O., Lydon John, Koskinen William C., Moorman Thomas B., Chaney Rufus L., Hammerschmid Raymond. 2012. «Glyphosate Effects on Plant Mineral Nutrition, Crop Rhizosphere Microbiota, and Plant Disease in Glyphosate-Resistant Crops». *Journal of Agricultural and Food Chemistry*, 60(42): 10375-10397.

Escobar Arturo. 2007. «The ‹ontological turn› in social theory: A commentary on ‹Human geography without scale› by Sallie Marston, John Paul Jones II and Keith Woodward». *Transactions of the Institute of British Geographers* 32(1): 106-111.

Fernandez Myriam R., Zentner R. P., Gehl D. T., Selles F., Huber D., Basnyat P. 2009. «Glyphosate associations with cereal diseases caused by Fusarium spp. in the Canadian Prairies». *European Journal of Agronomy* 31(3): 133-143.

Food and Agricultural Organization (FAO). 2010. *The second report on the state of the world's plant genetic resources for food and agriculture*. Rome: FAO.

Foucault Michel. 2004. *1978-1979 Naissance de la biopolitique*. Paris: Seuil.

Friedmann Harriet, McMichael Philip. 1989. «Agriculture and the state system: The rise and fall of national agricultures, 1870 to the present». *Sociologia Ruralis* 29(2): 93-117.

Guzzoni Ute. 2008. «Were speculation about the state of reconciliation permissible ... : Reflections on the relations between human beings and things in Adorno and Heidegger», in: Macdonald Iain, Ziarek Krzysztof (eds.), Adorno and Heidegger: *Philosophical questions*, p. 124-137. Palo Alto, CA: Stanford University Press.

Halbmayer Ernst. 2012. «Debating animism, perspectivism and the construction of ontologies». *Indiana* 29: 9-23.

Haraway Donna. 2008. *When species meet*. Minneapolis: University of Minnesota Press.

2003. *The companion species manifesto: Dogs, people, and significant others*. Chicago: Prickly Paradigm.

1997. *Modest_Witness@Second_Millenium. FemaleMan©_Mets_OncoMouse™: Feminism and technoscience*. New York, London: Routledge.

Heidegger Martin. 1959. *Gelassenheit: Aus einem Feldweggespräch über das Denken*. Pfullingen: Neske.

Ingold Tim. 2000. *The perception of the environment: Essays on livelihood, dwelling and skill*. London, New York: Routledge.

Kirksey Eben S., Helmreich Stefan. 2010. «The emergence of multispecies ethnography». *Cultural Anthropology* 25(4): 545-576.

Kohn Eduardo.
2007. «How dogs dream: Amazonian natures and the politics of trans-species engagement». *American Ethnologist* 34(1): 3-24.

Latour Bruno. 1993. *We have never been modern*. Cambridge, MA: Harvard University Press.

Locke John. 1690. *Second treatise of government*. Project Gutenberg. http://www.gutenberg.org/files/7370/7370-h/7370-h.htm, accessed February 23, 2014.

Macdonald Iain. 2011. «Cold, cold, warm: Autonomy, intimacy and maturity in Adorno». *Philosophy and Social Criticism* 37(6): 669–689.

Macfarlane Allan. 1998. «The mystery of property: Inheritance and industrialization in England and Japan», in: Hann Chris M. (ed.), *Property relations: Renewing the anthropological tradition*, p.104-23. Cambridge: Cambridge University Press.

Marx Karl. 1977 (1890). *Das Kapital*. 4th ed. Vol. 1. Berlin: Dietz Verlag.

1964. *Pre-Capitalist Economic Formations*. London: Camelot Press.

1959 (1884). «Economic and philosophical manuscripts of 1884», in: Marx Karl, Engels Friedrich (eds.), *Collected Works*, Vol. 3. Moscow: Progress Publishers.

1932 (1844). *Economic and philosophical manuscripts of 1844*. http://www.marxists.org/archive/marx/works/1844/epm/1st.htm, accessed May 12, 2014.

McMichael Philip. 2013. *Food regimes and the agrarian questions*. Halifax, Nova Scotia: Fernwood.

Müller Birgit. 2010. «Introduction: My own boss? Strategies of resistance and accommodation of rural producers to neo-liberal governance». *Anthropologica: The Journal of the Canadian Anthropology Society* 52(2): 233-236.

2008. «Still feeding the world? The political ecology of Canadian prairie farmers». *Anthropologica: The Journal of the Canadian Anthropology Society* 50: 2.

2008b. *La bataille des OGM: Combat vital ou d'arrière garde?* Collection transversal débats. Paris: Editions ellipses.

2006a. «Infringing and trespassing plants: Control over and responsibility for patented seeds at dispute in Canada's courts». *Focaal: European Journal of Anthropology* 48: 83-98.

2006b. «Introduction: GMOs – Global objects of contention. *Focaal: European Journal of Anthropology* 48: 3-16.

Pálsson Gísli. 2009. «Biosocial relations of production». *Comparative Studies in Society and History* 51(2): 288-313.

Patočka Jan. 1998. *Body, community, language, world*. Chicago, La Salle: Carus.

Rabinow Paul, Rose Nikolas. 2006. «Biopower today». *BioSocieties* 1: 195-217.

Slomp Jan. 2014. *Op-Ed: Bill C-18, the Agricultural Growth Act – Growth for whom?* http://www.nfu.ca/story/op-ed-bill-c-18-agricultural-growth-act-growth-whom, accessed May 10, 2014.

Van Dooren Thom. 2010. «Biopatents and the problem / promise of genetic leaks: Farming canola in Canada». *Capitalism, Nature, Socialism* 21(2): 43-63.

2008. «Inventing seed: The nature / s of intellectual property in plants». *Environment and Planning D: Society and Space* 26(4): 676-697.

Viveiros de Castro Eduardo. 2012. «Culture: The universal animal». *Hau: Journal of Ethnographic Theory* 1. http://www.haujournal.org/index.php/masterclass/article/view/107/135, accessed November 10, 2013.

1998. «Cosmological deixis and Amerindian perspectivism». *Journal of the Royal Anthropological Institute* 4(3): 469-488.

AUTHOR

Birgit Müller (PhD Cambridge 1986) anthropologist research director at the IIAC-LAIOS, CNRS in Paris, explores global governance of food and agriculture at the FAO and agricultural practices in Canada and Nicaragua. She examines worldviews and power in relation to seeds and soils. Among her books: Disenchantment with Market Economics. East Germans and Western Capitalism (2008), The Gloss of Harmony. The politics of policy making in multilateral organisations (2013).

IIAC-LAIOS
École des Hautes Études en Sciences Sociales
190-198 ave de France
75244 Paris Cedex 13, France
bmuller@msh-paris.fr