Agro-Digital Governance and Life Itself: Food Politics at the Intersection of Code and Affect

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Abstract

This article seeks to answer the following questions. How are digital platforms encountered and felt by producers and consumers and how do these assemblages shape the foodscapes we imagine and enact? How do elements like digital locks, proprietary code, and 'open' code inform how we think about the subject of agrofood governance? Finally, what are the lives being made to live, and left to let die, as a result of digital platforms, from those employing digital locks and proprietary software to those built on open source code? To do this, the paper draws upon two case studies. The first examines London-area producers and consumers linked to the web-based distribution platform FarmDrop. This is followed by a case study involving US producers loosely linked to the group Farm Hack; a group that promotes technology that is collectively built and freely shared, and which desires to 'hack' that which is not. To conclude, the article turns briefly to Berry's (2001) thoughts on interactivity. While insightful, as the concept helps us think about the less-than-overt ways in which code-based assemblages enable and disable, the aforementioned case studies allow for some refinements to what it means to do and be interactive.

Introduction

Much has been written about agrofood governance over the last two decades. This has made it difficult to summarise the subject as it has come to mean different things in different quarters. When used broadly, the concept speaks to formal governmental and institutional arrangements in addition to the associated networks, practices, rules, and norms that help hold ways of life – regimes (McMichael 2009), paradigms (Marsden and Farioli 2015), etc. – together. Elsewhere, agrofood governance speaks to structural and process-related aspects of creating, maintaining, and changing particular food networks (Roep *et al.* 2012). This article brings these two poles into conversation, to understand lives made to live and left to die, to

paraphrase Foucault (2003, p. 241), while also being sensitive to the making and reimagining of specific foodscapes. To do this, the paper draws upon two case studies. The first examines London-area producers and consumers linked to the web-based distribution platform FarmDrop. This is followed by a case-study involving US producers loosely linked to the group Farm Hack; a network that promotes technology that is collectively built and freely shared, and which desires to 'hack' that which is not. This sets members at odds with equipment manufacturers who 'lock' their proprietary technology with the help of passwords (digital locks) and legislation (legal locks). Reading these cases against each other, I hope to build new insights into traditional political economy approaches that see digital technologies as an expansion of neoliberal forms of governance.

Neoliberal forms of governance, at one level, involve the movement to optimise some forms of valued life over others, what Foucault (2003, p. 241) referred to as 'the power to "make" live and "let" die'. An example of a valued life in an agrofood context would be productivist agriculture and bodies, present and future, which are assumed to eat a certain way – conventional food 'need' projections (see e.g., Alexandratos and Bruinsma 2012) are premised on diets composed heavily of a handful of grains and meat, included a good bit of beef. This life, however, is coming at the expense of others, which are being let to die, such as peasant agriculture, artisan techniques, and traditional dietary and culinary traditions.

Just to be clear, life in this context should not be taken to mean exclusively 'ways of life': productivist agriculture vs. agroecological agriculture; processed food-based diets versus place-based and season-appropriate diets; etc. Life also refers to matters of affect. Affect speaks to those elements of affordance and control that, almost paradoxically, cannot be cleanly spoken for because they operate at a more-than-representational level. And yet, they play an enormous role in helping support certain lives while resulting in the collective forgetting of others. Antonio Negri (1999) refers to this process in the context of affective labour: those practices that result in particular knowledge, understandings, and images, as well as feelings, from wellbeing and excitement to anxiety. For an example of these processes – life-as-ways and life-as-affect – coming together, note how the question/anxiety 'How are we going to feed 9 billion people who all eat like the average western citizen?' evokes affective structures that help support a we-need-to-produce-more (productivist) way of life. Real alternatives, therefore, have to possess complimenting affective structures. If alternatives do not feel right they will never be realised.

Conceptually, this paper is animated by what has been described previously in this journal as a relational approach (Carolan 2013) – assemblage thinking (e.g., Lewis et al. 2016), vibrant materialism (e.g., Roe 2006), geographies of care (e.g., Abbots et al. 2015), enactive politics (e.g., Lowe 2010), and other styles of scholarship that look to describe how materialities, practices, and discourses matter in terms of their effects and affectivities. This approach is sensitive to the disjunctures between weighty social structures and those spaces of lightness where transgressions occur, movements that give rise to diverse socio-historical trajectories whose look and feel is shaped by where one stands and what one does. As argued in a recent piece by Gibson-Graham (2014), who point to Clifford Geertz's style of theorising to give their argument flesh, such scholarship reaches back in the social science cannon – what

they call 'weak theory', though it has gone by other labels (e.g., empiricist [Barry 2001, p. 22]).

Clifford Geertz (1973, p. 23) famously wrote about how 'small facts speak to large issues, winks to epistemology, or sheep raids to revolution, because they are made to'. Geertz was critiquing strong theory – one of those 'fascisms in our heads' that Foucault (2003, p. 30) warned us of. Geertz's worry was that once we start letting theory overtly guide our investigations and name events we risk missing grainy details that can help us grasp what is really going on, which is necessary if we are to avoid, in Whitehead's (1978) words, mistaking the abstract for the concrete. As opposed to employing strong theory, with its 'embracing reach' and 'reduced, clarified field of meaning' (Gibson-Graham 2006, p. 4), this paper engages in a style of scholarship that 'does not elaborate and confirm what we already know' but instead 'observes, interprets, and yields to emerging knowledge' (Gibson-Graham 2014, S149). My aim in this analysis, therefore, is to be attentive to both specificity and difference, which means resisting any urge to cleanly sum up epochs, such as by declaring ours a digital age (see e.g., Schmidt and Cohen 2013). Instead, this paper offers a series of concrete examples that, when combined with and overlaid alongside other observations, reveal dimensions of political life that operate in the 'cracks' (Massumi 2002, p. 133) of convention.

This provides context for why and how the aforementioned case studies ended up in this analysis. Both research projects began their lives as independent studies. I soon realised, however, that more could be learned by bringing the two into conversation than if each were left alone to tell its own story. Later in the article, to help tell this multi-sited story, I look to the data to answer the following questions, which emerged out of the research: How are these 'structures' (digital platforms) encountered and felt by producers and consumers and how do these assemblages shape the foodscapes we image and enact?; How do elements like digital locks, proprietary code, and 'open' code inform how we think about the subject of agrofood governance? And, what are the lives being made to live, and left to let die, as a result of digital platforms, from those employing digital locks and proprietary software to those built on open source code?

After answering these questions, I then turn briefly to some of Andrew Berry's (2001) work, namely, where he discusses interactive political power. Barry's writings on interactivity – where the analytic focus is on 'interactive and networked devices' (p. 31) – is particularly insightful as it helps us think about the less-than-overt ways in which code enables and disables, depending on with whom and how it is assembled and the feelings those connections and practices engender. The agrofood literature has only begun to critically engage with the subject of digital technology (e.g., Bronson and Knezevic 2016). Barry's work could prove useful for moving our thinking further on the subject, though I intend to build upon and thus extend his own framework in the process. The ultimate product will lead not only to a sharper critique of these technologies. By the article's end, a heuristic will be outlined to help delineate between agro-digital assemblages that may be worth encouraging and those whose effects are more problematic.

But first: rather than engaging deeply with relevant literatures on the front end the plan is to let the case studies guide the argument. This allows the data to identify

and speak to and with the relevant literature rather than being passively identified by it. The case studies will therefore now be introduced. This is followed by a broader discussion where the cases are read through each other, at which point tentative answers are given to the questions posed earlier, followed by some concluding thoughts about agro-digital governance at the intersection of interactivity and politics.

Case-Study #1: FarmDrop

The research for this case-study occurred between December, 2013, and September, 2015. During those two years interviews were conducted in the London-area with producers and consumers linked with FarmDrop. Recruitment for potential respondents began by reaching out to food activists and growers in the area who I had worked with in prior research projects. A snowball sampling technique was then utilised until theoretical saturation was reached. In total, 35 interviews were conducted. Fifteen of those interviews were with producers, broadly defined as this category included farmers, ranchers, dairy persons, and bakers who at the time sold at least some of their products through this distribution platform. The remaining 20 interviews were with consumers who used the platform to make purchases. The sampling was purposive. The aim was to obtain a relatively equal mix of producers and consumers who, when not utilising FarmDrop, either turned principally to conventional markets to meet their respective food needs or engaged chiefly with alternative foodscapes – direct to market channels, co-operatives and food hubs, farmers' markets, etc. I wanted to know whether one's location in either of these groups mattered when it came to how they answered interview questions; whether their respective embeddedness in different food worlds, if you will, could be linked to divergent understandings about foodscapes and their transformation. Each interview lasted approximately an hour and was tape-recorded and later transcribed. Pseudonyms are used to protect the identity of respondents.

FarmDrop is a London-based start-up founded in 2012 by ex-Morgan Stanley stockbroker Ben Pugh. Pugh's mission has been to restructure the food supply chain by removing the go-betweens that currently separate consumers and producers and thus give farmers a fairer financial deal without hitting consumers' pocketbooks. Producers receive an average of 70 per cent of the sales revenue through FarmDrop – even higher for commodities like milk: 80 per cent – while eaters obtain food that is priced competitively with what they would find at their grocery store. Factor in for free home delivery (on orders of more than £25), as well as for the fact that consumers are receiving vegetables that have been picked and breads that have been baked the same day as they are delivered, and it becomes apparent why respondents say the platform is price competitive with conventional distribution channels. To quote Steven (consumer), a frequent user of FarmDrop: 'With some products they're practically the same price as what I'd find at a supermarket. We're talking about food that has been picked that day. That alone deserves to be worth a little more than the crap that has travelled halfway around the world to get in my pantry'.

According to the company, the average distance separating customers and producers in this scheme is roughly 50 kilometres. As of late-2015, roughly 70 producers

supply goods to FarmDrop, which uses electric vans across three zones within London to make deliveries. The company also aims for transparency. Its website lists where each of its products comes from, along with extensive biographies of all affiliated producers, from farmers to bakers, pasta makers, and fisher-persons. What you do not see on its website is that FarmDrop is a proprietary platform developed with the help of crowdfunding and a number of significant individual investments. While a number of producers and consumers interviewed remarked that 'FarmDrop', in the words of one farmer, 'cuts out the middleman entirely', that is not entirely accurate. FarmDrop is actually standing in for traditional go-betweens. The frequently advertised revenue split is 80 per cent/10 per cent/10 per cent between those who raise and make the food (80 per cent), 'keepers' (10 per cent), namely, those who manage the online platform and encourage membership, and FarmDrop (10 per cent). FarmDrop is also a standardised alternative, which is to say its look and what it can do and the platform and code it is built on are all fixed – a common feature of any proprietary technology, think Microsoft Office.

The concept of farmer autonomy (e.g., Stock *et al*. 2014) came up repeatedly during interviews. FarmDrop is undeniably equitable, in the sense that it funnels far more of every pound spent on food back to producers than conventional supply chains. Yet it cannot be ignored that farmers are still beholden to key market actors in this arrangement: namely, FarmDrop. FarmDrop dictates prices, for instance. Thus while currently equitable, it is not unreasonable to wonder whether investors will always be satisfied with returns under the current 80/10/10 breakdown. Not unlike conventional firms, FarmDrop still commands sufficient leverage were they to demand a larger cut of revenue. This is not to suggest this will happen. Those associated with this platform seem genuine in their concerns for returning as large a share as possible to producers (Cohen 2014). My point is simply that the platform itself does not really *empower* producers. It might enrich them for the moment. But the structural asymmetries of the relationship still ultimately benefit FarmDrop.

Producers' grasp of this fact varied. Interestingly, the variance appeared to hinge on whether they have and/or are currently involved in distribution channels where they are allowed to set their own price. Take, for example, Mick, who had been selling his milk through conventional supply channels before linking up with FarmDrop. Mick mentioned repeatedly during our interview – five times over a span of roughly 65 minutes to be exact – the fact that he is, in his words, 'getting around 80 per cent of everything a consumer spends' when they buy his milk through FarmDrop. This is a considerably better than 'the 40 to 50 per cent cut' he would otherwise receive through more conventional channels. He never volunteered to comment on how the platform sets prices, though he did admit to 'probably sticking with [FarmDrop] even if they did alter their current spilt' of 80/10/10, which speaks to the aforementioned leverage that FarmDrop commands over producers. Later adding: 'Where else would I go? As long as the cut is better than what I'd get through conventional channels I'm sticking with them'. Near the end of the interview the subject of farmer price setting was broached. His response clearly communicates that the subject remained for him what Latour (2004a) calls a 'matter of fact': 'Setting my own price? Not sure how that would even work. Markets set prices, not farmers'.

Compare this exchange to that with Julie, a farmer who in addition to selling through FarmDrop also sells directly to London-area restaurants as well as consumers at various outdoor markets. Unlike Mick, Julie was quick to volunteer her 'concern about the inherent power inequities of the model'. When asked to explain, she likened what she called the 'FarmDrop model' to 'what you see in the conventional food system', noting that 'while FarmDrop isn't technically a buyer they position themselves as the only game in town for growers, which gives them the same level of market control as any large-scale buyer'. What Julie is talking about, in economic-speak, is a type of monopsony – also known as buyer power. Under monopsony conditions, market concentration reduces the number of buyers to the point that sellers (read: farmers, ranchers, etc.) have few options other than to accept the price dictated by the buyer. As Julie pointed out, while not a buyer *per se* FarmDrop is 'the only game in town' for those producers looking to sell their wares through this particular distribution channel, which in effect gives them the same structural advantages as any large-scale buyer. 'Fortunately', Julie later added, 'they [FarmDrop] are proving to be far kinder and gentler than actors in conventional markets. But that could change'.

Discussions related to such phenomena as consumer-oriented social change and consumer sovereignty were also freely volunteered among the eaters interviewed. As with producers, there were noticeable differences between consumers who regularly engaged with less conventional foodscapes and those who did not. In other words, the perceived efficacy of 'consumer sovereignty' varied between those who routinely engaged directly with producers – by, for example, attending local outdoor food markets or by visiting farms – and those who obtained their food exclusively through more centrally co-ordinated models with go-betweens, as exemplified by FarmDrop and more conventional markets.

Eaters located in the latter camp *all* expressed confidence in the power of consumer-oriented social change. The following two quotes are representative of these sentiments:

> 'It's empowering, really; knowing that with a few click of my mouse I'm able to vote' – a popular metaphor for those who ascribe to conventional images of consumer sovereignty – 'for an alternative food system'. Jessica (consumer)
> 'Thanks to FarmDrop consumers are literally able to buy social change. [. . .] Knowing that my purchases are enabling social change is rousing'. Mike (consumer)

Contrast these sentiments to those expressed by eaters who treated conventional distribution channels as avenues of last resort for obtaining food. The two quotes that follow capture the spirit of the views held among those from this group to the issues of consumer-oriented social change and consumer sovereignty.

> 'I'm not going to sit here and say that punching at my keyboard is really going to change anything. [. . .] Am I supporting a better distribution platform by using Farm-Drop? Of course. Of course that's true. But FarmDrop is only interested in solving one per cent of what's wrong with our food. Yes, farmers need to make a liveable wage and we all should eat less junk food. [. . .] Meanwhile labour and animal abuses are still occurring in the conventional system. Those things can't be fixed by what I buy [through FarmDrop]'. Colin (consumer)

'FarmDrop is a way for us to do something as consumers, with this important caveat: shopping only changes so much. There's no substitute for being politically active and socially engaged'. Diana (consumer)

The rise of so-called green consumption has brought with it questions about its relationship to political action. One argument asserts that political consumption individualises responsibility for environmental degradation and therefore 'crowds out' forms of social and political activism (Szasz 2007). On the other side of the debate are those who suggest that no crowding out occurs in these instances. For example, Willis and Schor (2012), investigating two datasets, the 2004 General Social Survey and a detailed survey of approximately 2,200 conscious consumers conducted by the authors, 'find that measures of conscious consumption are significantly and positively related to political action, even when controlling for political involvement in the past' (p. 160). Perhaps it is less a question of *whether* political consumption crowds out social and political action and more about *when* it does, and *why* it does in those instances. Rather than seeing matters in black and white, as either one (it does) or the other (it does not), perhaps we ought to reframe the question: What can be learned by comparing those instances when political consumption crowds out collective action with those that report a positive relationship between conscious consumption and activism?

Consumers who relied exclusively on FarmDrop and conventional markets for their food needs reported privileging the consumer sovereignty trope, believing that shopping alone could change the world. This occurred to the exclusion of other forms of social change, thus supporting the crowding out thesis. Meanwhile, as noted above, eaters who reported inhabiting alternative foodscapes expressed sentiments supporting the argument that political consumption can coexist with collective action, recognising that the former is no substitute for the latter. This helps illustrate the need to be sensitive to the multiple affects engendered by diverse assemblages otherwise lumped together as instances of agrofood governance. Practices can be and are embedded, and thus given meaning, within different networks. Understanding the worlds within which eaters grasp those encounters – the hallmark of weak theory – can enhance our ability to make conceptual and analytic sense of how we *make* worlds and not just reproduce them.

Case-Study #2: Farm Hack

Research for this case-study began on June 2014 and continued until January 2016. Starting with respondents known to myself, who were discovered through previous research (Carolan Online First a), I proceeded to grow the sample by utilising a snowball sampling technique. This project was not interested in Farm Hack as an organisation but in what the use of digital and legal 'locks' meant for this community in terms relating to governance, dependency, and their grasp of who and what they are (individual and group identity) and the future of agriculture more generally. My aim, therefore, was not to speak with only so called key actors. Those interviewed thus included individuals who submitted ideas to the group's website and regularly attended sponsored events as well as those, in the words of one, who 'participate

from a distance' (Louise). A total of 18 producers from around the US were inter-viewed who reported varied degrees of involvement with Farm Hank. Six managed less than 100 acres; five managed between 101 and 500 acres; four managed between 501 and 1,000 acres; and three managed more than 1,000 acres. Interviews lasted between 50 and 70 minutes and where tape-recorded and then transcribed. Pseudo-nyms are used to protect the identity of respondents.

Farm Hack, as the group's website explains, is 'a worldwide community of farm-ers that build and modify our own tools. We share our hacks online and at meet ups because we become better farmers when we work together' (http://farm-hack.org/app/). It would be impossible to give a count of this group's membership, as it is not the type of group that counts its members. Yet given the group's calendar of events (http://farmhack.org/calendar/month), and based on my own conversations with 'members', it is fair to assume those loosely affiliated with this group number in the thousands. (Farm Hack UK was launched in April of 2015). As noted earlier, how-ever, my interest was not in Farm Hack *per se* but in how these farmers respond to firms' utilisation of digital and legal locks; Farm Hack, in other words, as a *call and response* to a highly proprietary style of socio-techno-agrofood governance.

> 'We used to be able to fix damn near anything with spit and sweat, a couple bungee cords, and bailing wire'. This quote comes from Berry while in his machine shed, which not coincidently was filled with tractor parts, old equipment, and even, hanging on a far wall, bungee cords and bailing wire. He continued, 'Not anymore. Now, when my com-bine or tractor breaks down, mine mind you, I own it, but when it breaks down I not only can't fix it, I'm not even legally allowed to, even if I could, which I can't'.

What Berry is referring to is the growing reality that farmers are no longer legally allowed to repair much of their own equipment. To quote another producer inter-viewed: 'How many farmers does it take to fix a tractor? Zero! A generation ago the answer would have been one. Today, for a farmer to fix his equipment he'd need a small army of lawyers and a few politicians in his pocket' (Clint). The literature is rife with examples of farmers' growing dependence, on seed firms (Kloppenburg 2005), petrochemical firms (Mancus 2007), and buyers through contracts and mar-ket concentration (Howard 2016). But dependence on software technicians and implement dealerships?

The (US) Digital Millennium Copyright Act (DMCA), passed in 1998 to prevent digital piracy, declares it a breach of copyright to break a technological protection. To put it simply, the DMAC makes it illegal for a tractor's owner to access, for instance, their tractor's engine control unit (tECU). To make sense of why this matters, and how this constitutes producer dependency, allow me to report on my interview with Bob. Bob owns and operates a little over 1,000 acres in northern Iowa. Located in the heart of corn growing country, Bob's is essentially a corn-soybean operation. 'I have a good bit of time throughout the year – between cultivations, before harvest, winter, early spring – for repair. It makes sense for someone like me, with an operation of this size, my operation isn't huge, to fix what I can. That's getting a lot harder'.

Bob went on to tell me a story about when one of his tractors would not start. After giving his machine 'a good onceover', in his words, he was able to determine that there was nothing mechanically wrong with it. And yet the tractor was locked

up, which is to say its engine would not turn over when the ignition switch was engaged. 'I knew it must have been a sensor but there was nothing I could do about it but call the dealership [that I bought it from]'. The ordeal took a day away from Bob: 'That's another frustrating part. Not only can't I fix my equipment but when I need equipment I *need* [emphasis in voice] it. I can't afford sometimes to lose even a day; a storm might be coming and I might need to get out in the field before it hits'. According to John Deere, in a letter to the US Copyright Office, farmers receive 'an implied license for the life of the vehicle to operate the vehicle' (as quoted in Wiens 2015). It would seem John Deere believes 'owners' of its equipment are in fact lessees. If true, this would leave John Deere, if not the outright owner of its already-sold equipment, with the power to dictate what those who purchase it can and cannot do with it – an argument with eerie parallels to those made by biotechnology firms on questions of ownership over patented seeds (Aoki 2008).

In October, 2015, the Librarian of Congress ruled in favour of an exception to the DMCA that would allow anyone who owned a tractor (or car, truck, etc.) to tinker with its code. This might sound like a 'win' for people like Berry and Bob. Even the magazine *Forbes* declared immediately following the ruling, 'DMCA Ruling Ensures You Can't Be Sued for Hacking Your Car, Your Games, or Your iPhone' (Fox-Brewster 2015). While the magazine is technically correct, the victory for farmers rings hollow. As it turns out, only the individual who purchased the equipment can access and fiddle with its software under the exception. The moment she brings her (non-approved) mechanic to look at it, or, more likely, her computer tech specialist, a line in the legal sand has been crossed and they all become liable for copyright infringement. To quote another farmer (Julian) on this very point from before the ruling, whose comments seem to anticipate the DMCA exception and the dependency that remains in its aftermath: 'Even if I could hack into my tractor's engine control unit I wouldn't know the first thing about what I'm doing. The digital lock and the whole copyright thing are ridiculous; a strategy for companies to create a monopoly pricing structure. But even if that software were accessible, farmers like me would still be dependent on others to keep it working. My grandpa never needed an I.T. [information technology] specialist to keep his equipment running. Now farmers like me can't live without them'.

Those interviewed also volunteered, quite regularly, to talk about the importance of independence. For representative examples of its use see the following two quotes.

> 'I got into agriculture for the independence. The more I've become beholden to others the less this looks like what I originally signed up for'. Julian
> 'There's independence and then there's dependence. The moment it got to be that I could be sued for fixing my own equipment; I mean, I just feel like there's nothing I can do anymore without the help or permission of others'. Leslie

These quotes resonate with a distinction made by Emery (2015, p. 48), where he writes about actual independence: 'What I mean by *actual* independence, in contrast, is a concept that is not opposed by interdependence but by dependence' (emphasis in original). With this he added, 'Interdependence is necessary for farmers in their quest for independence from the structures of finance capital and the monopolizing power of large purchasers and supermarkets' (Emery 2015, p. 48). The

aforementioned DMCA exemption seems to privilege individualism, which Emery (2015) explains is often conflated with independence but is in fact diametrically opposed to it because individualism fails to appreciate how independence is achieved through interdependence. The DMCA exemption, by rigidly ascribing to what Emery (p. 47) calls the ideology of individualism, might let farmers, as autonomous individuals, tinker with their tECU. But, as already described, as most farmers do not have specialised training in code and software, this narrowly granted exemption does nothing *in practice* to reduce their dependency. And since it is still illegal for a 3rd party to access and alter the software of these machines, farmers remain effectively forced to rely upon dealership mechanics and other 'approved' service providers to keep their equipment running. In sum, the DMCA exemption is an example of how autonomy-as-individualism succeeds in reproducing structural dependencies.

The phenomena of autonomy-as-independence, or what Stock and colleagues (2014) call actual autonomy, in this context links up with something noted by Kitchin and Dodge (2011) in their discussion of 'code/spaces' – how the blending of software and everyday life risks creating spaces where the tacit knowledge of old analogue systems is being lost and the dependencies that occur as a result. Farming has long been populated by DIYers (Do It Yourselfers), as evidenced by Berry's earlier prideful claim about being able 'to fix damn near anything with spit and sweat, a couple bungee cords, and bailing wire'. This is becoming increasingly difficult thanks to digital (e.g., passwords) and legal (e.g., copyright law) locks.

At one level, then, there is the issue about the tacit knowledge *lost*, which we ought to be concerned about. This is where networks like Farm Hack come into the picture. To quote Kevin, speaking about the Farm Hack community: 'We're a living repository of knowledge. If we don't manage anything other than to help future farmers remember how to fix equipment we've done our jobs, because they're starting to forget'. Sociologists Donald MacKenzie and Graham Spinardi (1995) argued some twenty years ago that nuclear weapons were becoming uninvented due to nuclear disarmament trends and test ban treaties. 'If design ceases', they explain, 'and if there is no new generation of designers to whom that tacit knowledge can be passed, than in an important (though qualified) sense nuclear weapons will have been uninvented' (p. 44). What MacKenzie and Spinardi are referring to is a collective forgetting. This speaks to one of the things animating the community of Farm Hack, which desire to turn back the tide of forgetting how to repair analogue farm equipment.

Meanwhile, there is also the issue of the tacit knowledge *missed* under current arrangements. We have to be careful not to romanticise agriculture and farmers, as only possessing and being capable of possessing analogue tacit knowledge. Farmers might not have historically possessed advanced knowledge of computer platforms but this does not mean they are incapable of acquiring such skills. Producers of all scales and worldviews are utilising technologies in various ways. Some of these techniques arguably increase dependency while others enable novel innovations and interdependencies (Carolan Online First b). The narrow DMCA exemption, which privileges autonomy-as-individualism, makes it difficult for farmers to form epistemic communities through which they can acquire these new competencies. Farm Hack attempts to do this by nurturing autonomy-as-independence through the circulation of digital tacit knowledge – Orr's (1996) path-breaking ethnography of Xerox

repair persons highlights the degree to which the repairing of modern business technologies are reliant on tacit knowledge. Yet its members admit such a goal is hindered by certain barriers making this (tacit) knowledge exchange illegal:

> 'We do talk about the software side of things, we are called Farm *Hack* after all. But at the moment it's not a sustainable conversation. The legal environment definitely makes us uncomfortable diving too much into the nuts and bolt of how to rewrite John Deere's software. We might be mad as hell but we're not stupid'. Lanny

Others, however, were more optimistic and less risk averse:

> 'I wouldn't risk teaching someone to hack into their R and RT Series [John Deere tractor], but we a can talk about hacking at a general enough level. Once the knowledge is theirs I can't predict what they do with it'. Barb

Governance, affective labour and life

I will now read the above cases through each other to identify additional relevant literatures and make further conceptual connections. Doing this allows for a return to these earlier-posed questions: How are these 'structures' encountered and felt by producers and consumers and how do these assemblages shape the foodscapes we image and enact; How do elements like digital locks and proprietary code inform how we think about a subject like agrofood governance? And, what are the lives being made to live, and left to let die, as a result of digital platforms, from those employing digital locks and proprietary software to those built on open source code?

How are these assemblages encountered and felt?

How respondents experienced the technologies in question appeared to be shaped by the breath and diversity of related relationships, which gave shape to who and what they knew. For example, as already noted, producers and consumers linked to FarmDrop grasped the platform differently depending on their level of embeddedness within alternative foodscapes. A parallel finding came through in the Farm Hack case: the level of dependency/interdependency attributed to 'smart' farm implements was not a function of anything inherent to code but to the assemblages that served to hold those enabling/disabling relationships together.

   To unpack this finding, I return to the concept of affective labour, mentioned in the article's introduction – those practices that enliven particular knowledge, understandings, and images, as well as feelings, from well-being and excitement to anxiety (Negri 1999). The concept is good to think with here because it enlivens certain flavours of assemblage thinking, especially those that, in an attempt to reject essentialism, depict a world full of either 'actors' or 'networks' but which is otherwise unfeeling – that is, in a word, dead (Elder-Vas 2015). The point to be made with the concept of affective labour is that a highly rational, and thus disembodied, public (e.g., Habermas 1991) misses how our very vitality is being made, in some instances

at least, to be directly productive to capitalism and neoliberal forms of governance (Clough and Halley 2007).

In the case of FarmDrop, respondents' embeddedness within differing relationalities meant they were engaging in multiple forms of affective labour, which altered how the platform was experienced – for instance, as either a mechanism of social change or as something that needed to be augmented with non-market based political and social activism.

> 'This gets me excited. I usually have no idea where my food comes from. It's a powerful reminder; it's in your face this way. In supermarkets it's almost like they try to mystify things. With FarmDrop, knowing farmers are getting their fair share of profits, that's huge'.

This quote comes from Sally, who had recently begun purchasing through Farm-Drop when interviewed. Conventional distribution channels have routinely been criticised for creating separations, between eaters, farmers, animals, labourers, and places/spaces (Lyson 2004). One of the common critiques is that these distanced (Clapp 2014) foodscapes elicit practices that engender within eaters certain feelings, understandings, and anxieties that support the status quo (Carolan 2011). FarmDrop makes no attempt to hide its desire to enrol eaters in alternative affective forms of labour, which are designed, to borrow from Sally, to get consumers 'excited' about things like where their food comes from.

The issue goes beyond, however, whether eaters think they ought to engage in food-based social change. *What* ought to be changed and *how* we get there are important questions when it comes to imagining and talking about future foodscapes. As for why individuals might answer those questions as they did? That too seems to have had links to the affective labour respondents were engaged in. FarmDrop undoubtedly hopes to make eaters excited about and interested in where their food comes from, with the idea of, in Sally's words, 'knowing farmers are getting their fair share of profits' weighing heavily on eaters' minds. Yet the affective labour of pushing buttons on an iPad and reading about the various farms that supply Farm-Drop are limited in their affects. This point is evidenced by the fact that individuals who otherwise only engaged in conventional markets appeared to have different understandings of food futures than those more deeply enmeshed in alternative foodscapes.

To be clear, I am not suggesting digital technological forms all elicit narrowly embodied practices – reduced to pushing buttons and seeing images – or that they somehow all engender similar affects. While interviewing producers and consumers in the FramDrop case, I was made aware of alternative open source platforms. The most established platform discussed was the Open Food Network. Originating out of Melbourne, Australia, in 2012, the Network has since co-evolved with spaces around the world, as there are plans to have an Open Food Network UK, Norway, and South Africa. The Open Food Network, to quote Jen (a grower who has explored open source platforms), 'grows by sharing ideas, creating a space for all stakeholders, and redesigning code according to whatever comes out of those deliberative processes. It's about the creation of community-based ventures, for communities and according to their needs and resources'. Because Open Food Network is based on open source

code it is not standardised, which was Jen's point about how the platform allows individuals to 'redesign' it 'for communities and according to their needs and resources'. Unlike FarmDrop, then, which is a proprietary, price setting platform controlled by its founders, Open Food Network is freeing, as it gives communities and farmers greater autonomy – *actual* autonomy (Stock *et al.* 2014) – to co-create foodscapes.

Open Food Network offers important analytic contrasts to FarmDrop, suggesting the latter still has the potential of engendering forms of market governance, especially among those not entangled with other alternative foodscapes, where consumers exercise existing political beliefs rather than engaging critically with them, like whether 'the market' ought to set prices or farmers. This possible critique of FarmDrop is explored further in the following section, when discussing these cases in the context of interactivity. For the moment, just remember that we cannot speak about digital platforms monolithically, as if all engender similar affects. The Open Food Network also reminds us, as does Farm Hack, of the diversity of networks when investigating questions of agro-digital governance, which extend well beyond immediate actors/actants to include, for example, IP regimes, software developers, and software itself.

In the case of Farm Hack, there was nothing inherent about the code in 'smart' farm equipment that caused respondents to become structurally dependent upon firms or that could lead to the conclusion that these technological artefacts uniformly engendered specific practices and affects. Respondents learned to be affected (Latour 2004b) by code differently, depending upon the assemblages they were enrolled within. Code whose mass included the US Copyright Office, intellectual property attorneys, and firms (e.g., John Deere) had a noticeably different feel (affect) than code whose enrolments excluded those actors.

Barb, for example, has extensive computer experience. She is also a farmer, in addition to being, in her words, 'loosely affiliated with Farm Hack but fully behind the spirit of what it stands for'. She has created agriculture-based open source code, such as crop planning software that allows users to develop planting schedules, estimate yields, and calculate seed and fertiliser needs. Her interest in 'smart' agriculture technology, however, does not stop there: 'The DIY, open source, and small-scale poly-crop movements are coming together to develop their own version of "precision agriculture", like FarmBot' – an invention that was a finalist in 2015 for the prestigious Hackaday Prize (the winner receives either a trip to space or US$196,883).[1] She went on to explain how "smart technology doesn't have to be alienating". Adding that, 'too often those of us critical of Big Ag. are painted as being anti-technology; crazy back to the landers. We shouldn't be afraid of technology. It doesn't have to be alienating if we develop it together'.

It doesn't have to be alienating if we develop it together.   This is another way of saying it is not code *per se* we ought to be worried about. Instead, we should be discussing who and what these artefacts connect up with and the affects those assemblages create. Later in the interview, Barb explained how she 'enjoys getting together with other farmers and teaching them about software, and if they're really eager in things like programming language'. This is an example of *doing code together*. She

then added, to echo a point made earlier about how interdependence actually enhances autonomy: 'And it's incredibly rewarding for me; helping them find ways to become part of this broader community [of Farm Hack] while simultaneously freeing them from the grips of companies like John Deere'.

How do agro-digital assemblages inform our grasp of governance?

Should governance scholarship be only about reporting, explaining how regimes, paradigms, imaginaries, or foodscapes are held together by, in actor network theory language, following the actor and describing what one uncovers (Murdoch 1998, p. 360)? Abiding by the norms of disciplined scholarship, agrofood scholars are told to describe and explain but never judge. Yet when we are critical, agrofood scholarship is nothing if not critical – as evidenced by the descriptor inserting itself into titles of subfields, such as 'critical nutrition' and 'critical food studies' (see e.g., Guthman 2014) – we *are* judging (Stock *et al.* 2015). By investigating the effects and affects of agrofood governance, the article's findings have affinities with some of my previous work (e.g., Carolan Online First a, 2016, 2015), where architectures are sketched for what I call a politics of addition. This is a politics of creative immanence, where projects are evaluated not according to their ends (or even means) but rather on the lives they make thinkable and do-able.

An admittedly imperfect heuristic, its value lies in resisting attempts to see 'goodness' or 'badness' as inherent to any phenomena while still providing footing for critique. For example, the black box of 'technology' is often criticised, especially in more mainstream ('popular') critical food circles: e.g., biotechnology = bad/heritage seed = good (e.g., Engdahl 2007; Robin 2012). This is not to undermine scholarship critical of biotechnology. There are good reasons for expressing caution toward these artefacts, from their impact on farmer/peasant sovereignty (e.g., Bowman 2015) to their deleterious impacts on biodiversity, especially those holding genetic use restriction technology (GURT), colloquially known as 'terminator' genes (e.g., Kelbessa 2013). Yet the category of 'biotechnology' is not self-evident. We cannot therefore base a normative politics on the onto-epistemologically blunt assertion there is something inherent about these artefacts warranting critique. We can, however, ask what these assemblages make possible and do-able.

Critiques of agrofood are wide-ranging, touching on the erosion of bio-cultural diversity (Cocks 2006), monocultures of the mind (Shiva 1993), monopoly-pricing structures (Howard 2016), narrowing of food imaginaries (Gaytán 2004), flattening of tastes (Popkin and Gordon-Larsen 2004), and structural dependences (Otero *et al.* 2013). After pulling back, the aforementioned laundry list of what we are collectively critical of appear to hold a shared throughline: they reduce. They practice, in other words, a politics of subtraction. My aim is to bring this judgment to the discursive surface: practices that reduce ought not to be privileged over those that add to the world.

When we engage in questions of governance, then, we might think about what the forms in question make possible, while recognising that when we critique 'things' we might miss opportunities for addition. Similarly, practices of addition can

take multiple forms, which means additions 'here' come at the expense of subtractions 'there'. FarmDrop, for instance, is widely celebrated. As I have shown, there is certainly plenty about the platform to be applaud, as it does add to the world, such as by enhancing farm family livelihoods, which arguably enriches rural communities and so forth. But as a proprietary technology, its additions are tempered. Conversely, as Jack Kloppenburg (2014) notes, we must be careful not to fall into the trap of believing open source is somehow inherently 'good' or 'just'. Whether such artefacts add to world, like any artefact, remains a function of the scope and composition of their assemblages and the affective labour they make possible. Similarly, while it is easy to bemoan the loss of analogue tacit knowledge in agriculture, we must be careful not to miss possible opportunities (additions) in those movements. Examples of this already discussed include the formation of more-than-analogue epistemic communities that help share digital tacit knowledge and the development of novel relationships with the aid of digital platforms—Farm Hack is an international community thanks to code, after all.

Questions about governance, for those us approaching the subject from a relational perspective, ultimately concern issues relating to the governing of a 'commons' – a society of companions, to evoke Haraway (2006). The aim of this style of governance, therefore, to quote Isabelle Stengers (2000), 'does not belong to the future' (p. 155) but rather 'belongs to the present as a vector of becoming or an "experiment of thought", that is, as a tool of diagnosis, creation, and resistance' (p. 155). A politics of addition seeks to intensify those experiments of thought while multiplying vectors of becoming, thereby putting in place the footing for the making of real alternatives.

What lives are being made to live and left to die?

The lives being made to live and left to die are a product of what those aforementioned assemblages look and feel like and the affective labour they engender. There was incredible variability across the cases in this respect. For instance, in the case of Farm Hack, analogue tacit knowledge was being lost at the risk of dependence gained, though in some instances this lost analogue tacit knowledge was being replaced with digital tacit knowledge and interdependence. In the case of FarmDrop: the lives lived could not be accurately assessed without grasping broader assemblages, such as their embeddedness within other alternative foodscapes, which helped to shape whether the platform 'crowded out' more-than-consumption actions and imaginaries or whether it was grasped as one technique of many that collectively helped to enact social change. In sum: the lives made to live and left to die varied between and even within the cases, depending on the actors and practices enrolled.

Interactive politics: you must! you may! we can!

Andrew Barry's work on interactivity is good to think with when exploring issues related to agro-digital governance. His thinking on the subject also helps tie the above questions together, thus allowing the paper to conclude making a few overarching points about futures, food, and code.

Barry's (2001) work builds on Foucault (2003) and Deleuze (1988), where they articulate a contrast between those situations where political power is exercised unilaterally, famously by a sovereign, and those where it is exercised through devices throughout a population. Barry is especially interested in how 'technology is both part of a set of political problems, and the solution to these problems' (p. 19). Looking at the incorporation of certain interactive technologies into public museums, thereby allowing visitors to take part in the process of experimentation and discovery versus being passive vessels where they are told what they ought to know, Barry articulates a style of governance that is more multiple and dynamic than that found in Foucaultian disciplinary regimes. Barry names this mode of political power interactivity. In contemporary societies, to quote Barry, 'the task of the public authorities is not to direct or provide for the citizen but to establish the conditions within which the citizen could become an active and responsible agent in his or her own government' (p. 135). When viewed through this lens, 'interactive devices had a function, for they might foster agency, experimentation and enterprise, thus enhancing the self-governing capacities of the citizen' (p. 135), therefore promising 'to turn the museum visitor into a more active self' (p. 135) and, I would add, a more active citizen.

Yet Barry could take this argument further. I conclude arguing that the *types* of active selves engendered through interactive assemblages vary, from those creating more active citizens to others giving form to more-than-active citizens. To speak of an active citizen, versus someone who holds the status of citizen (a category that refers to citizenship as a bundle of legal rights and responsibilities and thus membership to a state), is to recognise that subjects who are not citizens in the socio-legal sense can still act as citizens. Yet, the practices performed by active citizens tend to be limited to such activities as voting (for those who can), volunteering, writing letters to the editor, signing petitions, even reporting 'suspicious' activity to the authorities (Isin 2009).[2] To be an active citizen, then, is to engage in acts that are routinised, supporting pre-established norms and ways-of-being. Active citizens thus have limited capabilities for making differences that deviate too far from convention. Meanwhile, activist – or more-than-active – citizens look to disrupt routine, practice, and thus understandings of what is and ought to be, which makes theirs a political project versus politics as usual (Carolan Online First b).

The interactive assemblages investigated in this paper all sought to promote political subjects, either in the form of more active or more-than-active citizens. FarmDrop, for example, promises to create consumer citizens, where 'by shopping with FarmDrop you're supporting the local ecosystem and the people and businesses that make it possible', to quote directly from their mission statement (FarmDrop nd). In this sense, the platform represents an example of market governance enabling consumers to exercise their political beliefs through their purchasing choices. To quote Mike, a regular consumer through FarmDrop, 'It allows me to be political with what I eat and who I choose to get my food from, but instead of casting a ballot I'm tapping away at my computer'. Elsewhere, we saw assemblages, like FarmDrop-participants-also-entangled-with-other-alternative-foodscapes and Farm Hack, engendering political reflexivity, where politics itself, it terms of what it means to *do* it, was questioned. In the words of Jill,

'We're' – referring to the Farm Hack network – 'not interested in electoral politics
[. . .and. . .] given that most of what we make is homemade we're not interested in market-
based social change. [. . .] This is about a group of people coming together to ask the ques-
tions that convention doesn't want asked. Should information be locked away and owned?
Should farmers be beholden to corporations, or should it be the other way around?'

The politics practiced by more-than-active citizens is often neither immediately nor
even directly interested in the reordering of the state, which is perhaps why these
practices fly under the radar of most conventional political economic approaches.
And yet, as others note (e.g., Epstein 1988; Haraway 1988), they represent important
prefigurative moments, offering resources – such as by leaving 'traces' (Arditi 2014)
– that can be reinvested by future mobilisations. Activist citizens engage in practices
– e.g., '. . .*coming together* to ask questions that convention doesn't want asked' – that
help make the unthought-of thinkable and the undoable routine.

Elaborating on the distinction between discipline and interactivity, Barry (2001, p.
149) writes that the former 'implies normalisation; the injunction is "You must!"'.
Meanwhile, interactivity 'is associated with the expectation of activity; the injunction
is, "You may!"'[3] But this assumes there is only one style of active citizenship, where
actions, outlooks, and understandings are already set. The injunction 'You may!',
after all, implies a fixed self-facing 'choices' between predetermined practices – e.g.,
you may engage in market-based social change by purchasing eggs through Farm-
Drop or buy them at Tesco. In the above case studies we also witnessed, however,
more-than-active citizens unsatisfied with what is allowed by convention. Their
assemblage-inspired outlooks appear to call-forth collective-based imaginaries about
what it means to engage in politics, based more on 'coming together', to again repeat
something said by Jill, than 'taping away' alone at one's 'computer' (Mike). For these
subjects, agro-digital governance is less an injunction – e.g., 'You may!' – and more a
call to collectively create something genuinely novel: 'We can!'

Notes

[1] FarmBot has been called an open source automatic precision farming machine (http://wiki.
farmbot.cc/wiki/The_FarmBot_Project). It looks similar to a 3D printer hovering above soil
but instead of constructing something made of plastic it uses its injectors to expel seeds,
water, and fertiliser.
[2] I am not claiming these acts are inherently good or even universally beneficial to society. For
instance, the expectation (as 'good' citizens) to report people and activities that deviate from
the social norm to authorities can have numerous socially and politically deleterious effects.
[3] The injection 'You may!' is also the title of a Slavoj Žižek (1999) essay. It summarises 'our
post-political liberal-permissive society' (p. 4) with new guilt and anxieties, where we are now
allowed to indulge without punishment, 'just as you may eat fat-free salami without risk to
your health' (p. 6).

Acknowledgements

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