

Animal Deliberation

The Co-evolution of Technology and Ethics on the Farm

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Animal Deliberation

The Co-evolution of Technology and Ethics

on the Farm

Clemens Driessen

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Contents

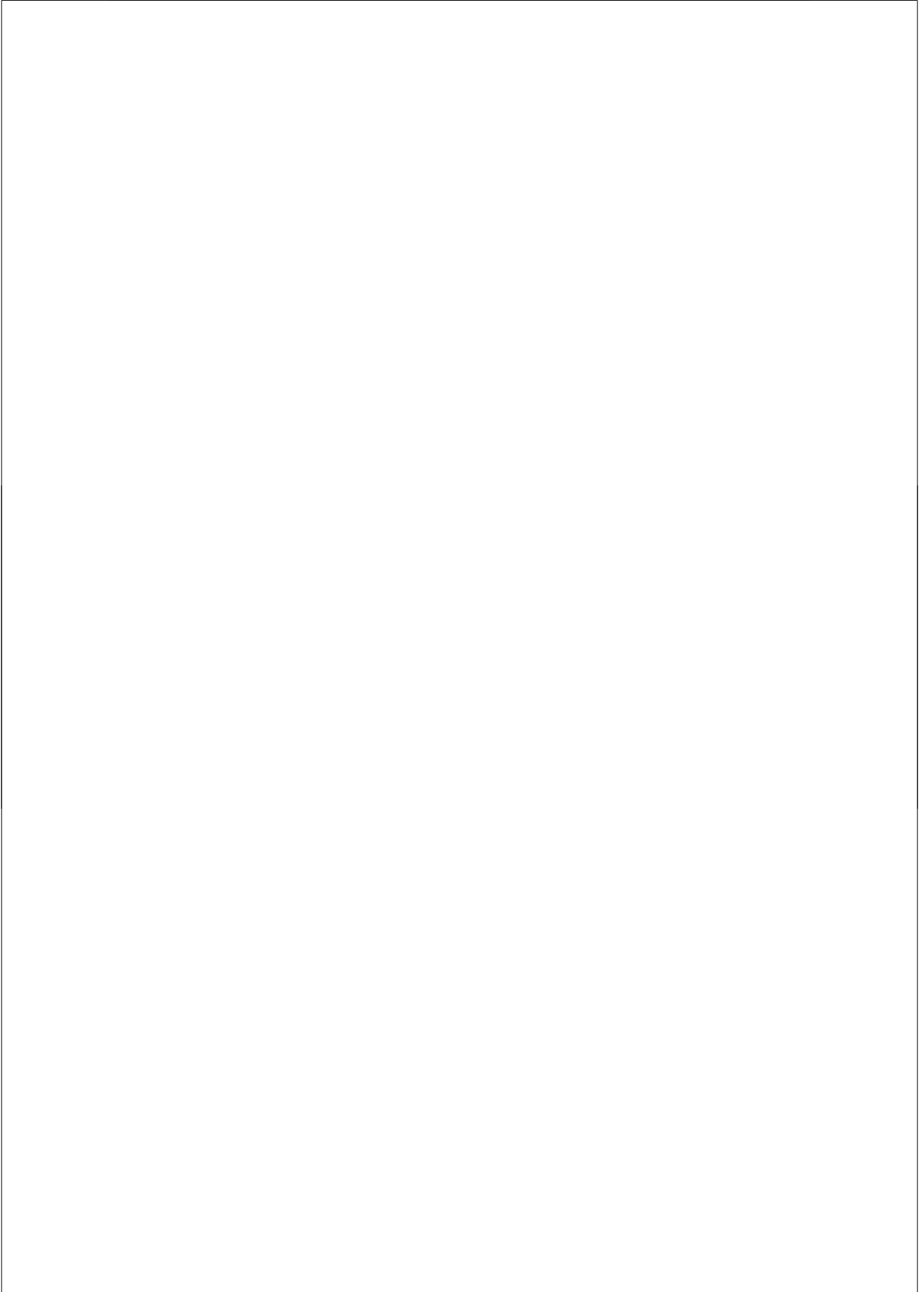
Prologue	
A philosopher on a pig farm	11
Chapter 1	
Introduction: ethics on the farm?	15
1.1 Ethics and food? The place of ethics	15
1.2 Animal farming, a mosaic of concerns.....	16
1.3 Visualizing the moral mosaic, or, where to situate moral agency?	19
1.4 Applied ethics as a genre, or, how to do ethics when ethics is also (material) culture?.....	23
1.5 Outline	37
Part I	
Ethics on and beyond the farm	51
Chapter 2	
Farmers engaged in deliberative practices – an ethnography	53
2.1 Introduction.....	53
2.2 Three approaches to the mosaic of concerns.....	56
2.3 Researching ethics by doing fieldwork	58
2.4 Farming as a matter of mixed motives	60
2.5 Regimes of justification as a model to draw out the moral complexity of farming practices	62

2.6 An example of ethical decision making as practical engagement: cow horns.....	68
2.7 Implications of the sketch of farmer ethics for deliberations on sustainability	71
Chapter 3	
Pig towers and in vitro meat: disclosing moral worlds by design.....	75
3.1 Introduction	75
3.2 Redesigning animal farming: pig towers and in vitro meat	78
3.3 The dynamics generated by pig towers and in vitro meat.....	83
3.4 Dewey, Heidegger and the dynamics of moral world disclosure.....	93
Part II	
Milking robots.....	101
Chapter 4	
Cows desiring to be milked?	
Milking robots and the co-evolution of ethics and technology	103
4.1 Introduction	103
4.2 Conceptual background: co-evolution on the farm	105
4.3 Empirical approach	111
4.4 Ambiguous technology assessment.....	112
4.5 Co-evolution of ethics and AMS technology.....	117
4.6 Conclusion: ethical assessment as part of co-evolutionary dynamics	130
Chapter 5	
Animal deliberation	
taking animals seriously in political thought and material practice	135
5.1 Introduction	135
5.2 Cats and doors: animal politics by design	137
5.3 Deliberating in the field: making a mobile milking robot	139
5.4 Political animals in theory	142

5.5 Deliberating on a par	146
Intermezzo	
A philosopher in the mobile robot farmers' network	
– a visual intervention	153
 Part III	
Playing with pigs.....	161
Chapter 6	
Caring for bored pigs: game design as multispecies philosophy.....	163
6.1 Modern human-pig relations.....	163
6.2 Maintaining interpretive flexibility: making a boundary object for deliberative play.....	170
6.3 Designing with pigs as doing multispecies philosophy.....	172
Chapter 7	
Five criteria for meaningful play with farmed pigs.....	181
7.1 Subversive encounters?.....	181
7.2 Animal nature-cultures?	185
7.3 Testing and ranking?.....	190
7.4 Symmetry and reward?	193
7.5 Voluntary and open?	203
Chapter 8	
The morality of mediated interspecies play:.....	211
on designing a moral subject.....	211
8.1 Genres and morality	211
8.2 Moving beyond the empathic subject and its perspectival mind.....	214
8.3 Genres, ethics, subjects, experience, minds and science: a co-evolutionary ecology?.....	219
8.4 Playing with pigs for a new multispecies community.....	224

Part IV	
Conclusion	231
Chapter 9	
Show, don't tell? The conclusion of this thesis is not (just) a text.....	233
Chapter 10	
A conclusion in the making.....	247
10.1 On the very idea of a general conclusion in situated ethics	247
10.2 Ongoing efforts towards playing with pigs as a conclusion	249
1 – <i>Opening up ethics as a genre</i>	249
2 – <i>A high-tech mediated farm visit</i>	254
3 – <i>Disclosing moral worlds by game design</i>	257
4 – <i>Intensifying the co-evolution of ethics and technology</i>	263
5 – <i>Playful animal deliberation</i>	265
10.3 Pitfalls and prospects.....	268
Epilogue	
Back on the pig farm.....	279
Bibliography.....	283
Summary.....	315
Samenvatting.....	329
Acknowledgments	343
Biography.....	359





Prologue

A philosopher on a pig farm

Sometime at the beginning of 2009, we were sitting at a kitchen table as the guests of a pig farming family in a small Brabant village. We –the farmer who was hosting us, an animal scientist and expert in pig behaviour, a representative of the regional farmers’ association, two other pig farmers, and yours truly, a philosophy PhD student studying ethical concerns in farming practices– had been discussing ‘ethics’ for over an hour. The main theme of the discussion was so-called enrichment material: ‘toys’ that were by then mandatory according to EU regulations. Enrichment material has to be provided in each pigpen (of eight to twelve animals) in order to reduce the boredom of the pigs and their associated aggressive behaviour. Farmers are to some extent free in their choice of materials and type of objects, as long as it is more than a simple metal chain. Mostly this means the pigs receive a chain with a small plastic ball attached to it, suspended from the wall.

Earlier that day, the animal scientist, assisted by the philosopher, had been observing the percentage of time the pigs played with the plastic poles that this farmer had positioned between every two pens as a creative and cost-effective solution. The pigs seemed to find these poles more interesting than the simple balls, especially as they allowed for interaction with the pigs in the adjacent pen, with some pigs on either side adamantly pushing and pulling the pole back and forth.

But now we were no longer in the dusty barn amidst the squealing pigs and the nauseating smell of their manure collected beneath the slatted concrete floor. We had showered, and were almost done with discussing what type of enrichment materials would be more interesting to the pigs and would actually reduce aggression and damage to the animals. No clear alternatives that were acceptable to the farmers had come up. Straw is difficult, as it costs money and time, both of which are scarce in the highly marginal economic reality of the intensive pig farm. It was in

the final moments of discussing the topic, when it was becoming clear that we were not really getting anywhere, that the farmer, in whose kitchen we sat, started thinking more freely and, perhaps in desperation, said: "Should we paint a forest on the walls of the pens, then; would they like that?" We stared at the watercolour hanging on the kitchen wall, an idyllic view of pigs lying in a field next to a pool of mud, rather in contrast with our experiences of that morning, which we had pointed out earlier. Then she said: "Or give them what our children play with; they just got their Wii." There was laughter, and the topic was closed for the day.

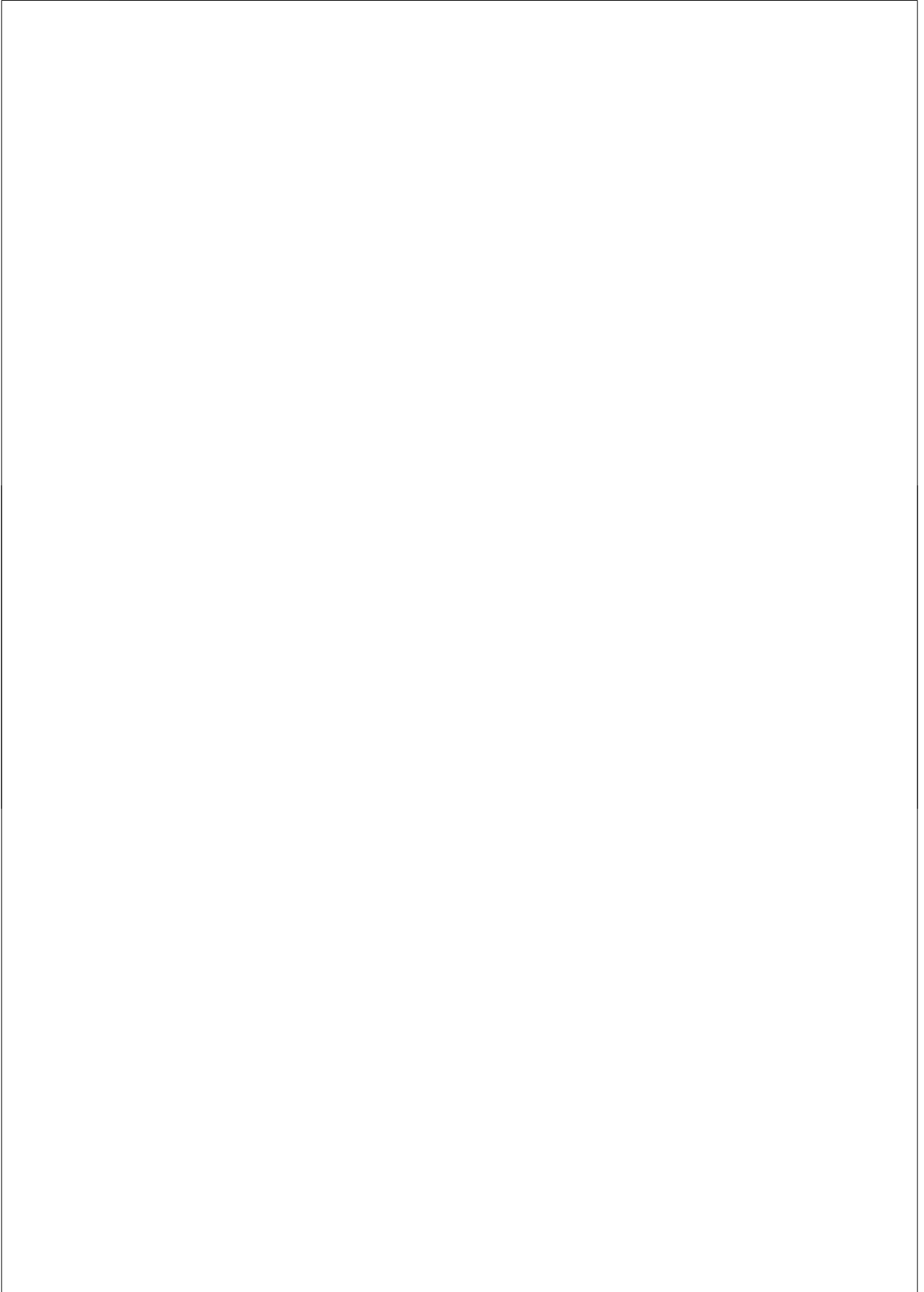
What could philosophical inquiry contribute to ethics on the farm? Most philosophers that have dealt with issues related to farming – with a few exceptions, such as Paul Thompson (1995) and Bernard Rollin (2003) – have not been very interested in the experiences of farmers. Sitting here, with this group of farmers waiting to hear my views on 'what society wants from them', I felt rather at a loss. A burgeoning philosophical literature has been produced on animal ethics and farming, especially since the publication of Peter Singer's *Animal Liberation* in 1975. From within most ethical theories and approaches it has been argued that our only sensible response to the injustice of killing pigs and treating them as we do is radical reform, if not outright abolition, of (intensive) pig farming. This is argued for in terms of calls to reduce the suffering of sentient beings (Singer 1975), out of respect for the rights of animals as subjects of a life (Regan 2004), because of the impossibility of pigs leading a flourishing life under these conditions (Sunstein and Nussbaum 2004), or just because of (some form of) common sense about what it means to be human and how we should relate to animals such as pigs (Diamond 1978; McKenna and Light 2004). During each visit to a pig farm, I experienced some moral call to do something about their situation – the horrific smell; the sadness of their confinement.

What could I possibly contribute to this philosophical debate that has been going on for at least 35 years now (or even since the days of Pythagoras, or at least Bentham) that has not been said already – and probably much more precisely and eloquently? Another aspiring philosopher adding her- or himself to the chorus of either abolitionists or reformists does not seem a very worthwhile course of societal intervention. Apart from a small constituency of vegetarians, vegans, and organic meat eaters, most *consumer-citizens* are still buying large quantities of cheap animal protein, seemingly unimpressed by the protests of the –albeit perhaps somewhat growing– animal movement. All those involved appear undeterred by the wealth of arguments of the academic ethicists. And besides, when one visits dairy and pig

farmers, they seem honest, hard-working, and generally well-intentioned people, who, within their specific practice and in their way can even be thought of as in some sense caring for their animals (Harbers 2003; Fraser 2001; De Greef et al. 2006; Thompson 2004; Cohen, Brom, and Stassen 2009).

Moreover, the pigs locked up in groups of about ten, in cages of seven to ten square metres, would perhaps at first be glad to be liberated, but sending all 15 million Dutch pigs to the woods would be (at least within the Netherlands) not feasible without grossly interfering with human and other animal life.¹ Are their lives truly so bad that these pigs would rather be dead? Is it in their interest for animal production to be phased out? How much do they suffer, how bored are they, and why can't they stop attacking each other? If only we could ask. But how could we communicate with them?

¹ This is especially so as the number of wild boar that are allowed to live in the Netherlands is just a few thousand, reduced by more than half each year through hunting.



Chapter 1

Introduction: ethics on the farm?

1.1 Ethics and food? The place of ethics

What shall we eat? Not too long ago this daily dilemma was considered to be squarely outside of the sphere of ethics. Ethics commonly is defined as concerning acts that involve harm to others (in liberal/utilitarian understandings of ethics), that are prescribed by duties (in deontological theories), or as dispositions that contribute to character formation (in virtue ethics). Ethical theorizing in the latter half of the twentieth century has developed mostly around questions that come up in places like hospitals (Toulmin 1982; Beauchamp and Childress 2001). 'Ethical' were the major decisions on life and death. Homely affairs, such as buying bread or taking a shower, were not just private, but quintessential morally irrelevant acts. Otherwise we would spend an inordinate amount of time to reflect on all the minutiae of those habitual decisions. But apart from this practical barrier, the bakery and the bathroom were not where morality was imagined to take place. These sites are part of the morally neutral background world in which we sustain our everyday private affairs; whereas we encounter actual ethical situations only at truly defining moments in our lives and when making (often collective) decisions about what we agree to be important things.

Perhaps it was already telling that it was always at the baker's, never the butcher's, where the ethically neutral consumption was situated in this example. Anyway, over the past decade we have witnessed the broad realization that our everyday behaviours, including our use of natural resources such as fresh water (e.g. when showering) and choices regarding where and how our food is produced (Korthals

2004), are no longer assumed to be merely mundane expressions of private preferences, but amount to the defining societal issues of our lifetime. Since a few years we have become aware that a supermarket is a moral minefield, where behind every increasingly complicated product label decisions lurk regarding the enslavement of African cocoa workers, the destruction of tropical rainforests, the obesity pandemic and the living space of laying hens. Sometimes all of these in a single item. This means that agricultural production and food consumption have, in terms of the pragmatist philosopher John Dewey, stopped being mere unreflective habitual acts, to become broadly considered as 'problematic situations' (Dewey 2008; Kosnoski 2010, 100).

1.2 Animal farming, a mosaic of concerns

When looking at food and agriculture, especially livestock farming is an increasingly problematic and contested activity. A mosaic of interlocking concerns has become ever more prominent and urgent regarding animal use in food production, see for instance Steinfeld et al. (2006). A modest attempt at an overview of ethical issues (in no particular order) would include:

1. The suffering of millions of animals, either raised to be slaughtered or for producing milk, eggs, or other animal products.
2. The environmental pollution of water, soil, and air due to manure storage and deposition, as well as emissions of CO₂, methane and other climate change inducing gases.
3. The health risks to inhabitants and visitors of areas near farms, affected by environmental pollution but also by zoonotic diseases.
4. The increasing resistance of bacteria to antibiotics due to the routine use of those as growth promoter, and the possible health risks of medicine residues in meat and dairy products;
5. Local as well as global effects on nature and biodiversity due to the space required for the production of animal feed and its implied destruction of wild habitat, contributing to the current mass extinction of species.
6. The environmental costs of transporting animal feed across the globe, including the resulting regional nutrient imbalance and manure surplus.

7. The effects on marine ecosystems due to acidification and other forms of pollution, with rivers discharging pesticides and surplus fertilizer into the seas.²
8. The depletion of scarce resources such as fossil fuels (for artificial fertilizer and transportation) and phosphorus.
9. The use of large amounts of fresh water for feed production, also in places where this is a scarce good.
10. The usurpation of arable land for animal feed production that could have been used to produce food crops directly and more efficiently, and the related concerns of hunger, global justice, food security and fair trade.
11. The human health effects of eating (large amounts of) intensively produced meat.

Besides these negative effects of most forms of contemporary animal production, there are a number of ethical concerns that are internal to the practice and its products, some of which can also be considered as positive:

12. The supply of affordable, healthy and safe food of quality and taste;
13. Labour conditions and income of farmers and farm workers, including that of slaughterhouse workers;
14. Rural livelihoods and the regional economy, also considering the increasing scale of agricultural production in the light of rural depopulation and land abandonment.
15. Aesthetic and cultural valuation of agricultural landscapes which are under pressure both from intensification and alternative land use.
16. Accessibility or traceability of agricultural production to the public and consumers.

What we are confronted with here is a remarkable variety of issues. Not just in terms of the kinds of human and other subjects with a stake in them, but also the amount of governmental institutions and policy terrains involved: food safety,

² This thesis does not deal with the aquaculture sector of animal production. Even though in terms of the amount of animals involved it is larger than all other sectors combined, the issues encountered there seem to be significantly different in their internal dynamics and societal meanings to require a study of their own (Driessen 2013). Though it should be acknowledged that this common bracketing off is not innocent, e.g. considering the neglect of fish welfare (Braithwaite 2010).

agricultural policy, spatial planning, international trade, animal welfare, environmental health, nature conservation, public health. The social movements concerned with these issues include environmental, fair trade, consumer rights as well as animal and nature organizations. Debating the issues that are at stake is often highly complicated, which is attested by the sheer range of scientific experts required to understand and get a grip on these: economists, biologists, ecologists, atmospheric scientists, food scientists, rural sociologists, perhaps even philosophers. What also stands out is the all encompassing scale and pressing nature of most of these concerns.

Abolition

But surely, when we look at the long list of concerns related to animal production, there is an ethically coherent, systemically obvious, and technologically available solution that stares us right in the face? The whole variety of interconnected crises – from the obesity epidemic to global hunger, from the destruction of rainforests to the suffering of domesticated animals, from rampant antibiotic resistance to algae blooms in rivers and oceans – would be greatly helped, if not completely resolved, with a mere collective transition to a diet of plant based proteins and the abolition of current intensive industrialized farming. Or better yet, of animal farming across the board.

One does not need much ethical theorizing to arrive at this conclusion. For a number of people the issue of animal suffering alone is enough to try and live outside of the animal-industrial complex. Considering the broad range of effects and the pressing nature of these issues, there seems to be no need to quibble over philosophical questions such as the defining difference between humans and animals, or whether deontological, utilitarian or virtue ethical theories provide us with the best arguments for reform. A transition to a viable, completely animal-free agricultural system would require rethinking soil fertilization without animal manure³, but apart from such technicalities there seem to be only advantages. If humanity is to survive its expected growth to nine billion individuals this century in any decent way, sooner rather than later some significant shifts in consumption patterns and production systems would be required. And this is already the case seen from a short term and narrowly anthropocentric position, so without considering the effects on the last remaining wildlife habitats.

³ Human manure seems an obvious solution

Several things could be said in defence of some forms of animal use for food production and consumption, ranging from ideas on physiological necessity to communal traditions, human-animal relations, and cultural landscapes. But it seems hard to argue in these terms for ever more industrial forms of production that seem completely devoid of tradition and meaningful human-animal relations, nor very healthy. The remainder of this thesis is written from a position that basically accepts –or rather assumes– the idea of farming with animals, at least for the near future.⁴ At the same time though, the thesis can be considered as a continual struggle with the question of the appropriateness of animal use. The possibility of more radical modes of reforming our relations to food, animals, landscapes and the environment will pop up in various ways.

If (or as long as) rearing animals for food is not abolished, the question emerges how to think through farming practices to deal with the myriad moral concerns listed above. Some have argued that forms of animal based food production can be imagined in which up to half of current production could be environmentally sustainable (Fairlie 2010; Korthals 2012). This radical reconstruction of farming would for instance entail shorter production chains, feeding cows with grass and pigs with food waste rather than grains.

In the incremental, meliorist outlook on problematic practices that this thesis is meant to contribute to, new questions rise to prominence: How to improve things? What counts as improvement? E.g. what does higher welfare for farm animals amount to in practice? What makes for farm labour quality? What is an attractive and meaningful landscape?

1.3 Visualizing the moral mosaic, or, where to situate moral agency?

How did we become aware of all these concerns over environmental destruction and animal suffering? And how are we to reflect publicly on agricultural practices? A

⁴ Interestingly, some of those debating animal welfare in current day practices express confidence in the continuation of (intensive) animal farming only for a surprisingly short period, e.g. ‘the next decade’ (Paul B. Thompson 2012). Nevertheless, proponents of intensive farming tend to point to the ever growing global demand for meat and dairy products with the rise of disposable income in developing countries (Delgado 2003).

large number of TV reportages, newspaper articles and books are now informing us of the hidden worlds behind the product labels. Internationally prominent portrayals of contemporary agricultural production are critical documentaries such as *Our Daily Bread* and *We Feed the World*.

Our Daily Bread (Geyrhalter 2005) offers a disconcerting visual display of modern food production systems. With a title conjuring up religious connotations, it reveals instead how fully automated, mechanized, and technological our food production has become. In long, steady shots we are confronted with a series of monotonous acts, such as spraying pesticides in a greenhouse, sorting baby chicks on a conveyor belt and cutting through carcasses with a purposefully designed electrical saw. Activities performed mechanically, in which all living (and dead) beings seem to have become part of the technology in which they are taken up. Activities of sowing, harvesting, and slaughtering, which in premodern times would have been embedded in seasonal rituals and collective festivities, are displayed as sanitized, optimized and utterly meaningless. No one speaks in this film. Or at least not in a way that meaningfully relates to what seems to be going on. Mostly what we hear is the throbbing sound of machinery that provides an endlessly pounding rhythm to the repetitive movements of human arms, animal bodies and mechanical systems.

Even though we see people performing a variety of tasks, human subjects do not really figure. Their minds seem empty. There appears to be no other way to behave than to follow the prescriptions of the machinery, itself the outcome of the combined economic and technological laws of efficiency. The morality inscribed in the technological systems is exclusively directed at this value, the optimization of a particular market logic based on consumerist needs and desires that themselves go unquestioned. Consumers seem to be carefully kept –and perhaps prefer to keep themselves– in the dark regarding these processes and their industrial aesthetic. Food products are packaged in appealing wrappers that come with a nod to rural ideals of frugality and community. Humans are portrayed as artisanal and animals as content. Thus, unaware of the realities of industrial agriculture, most of us mentally inhabit a milk-carton version of a 17th century landscape painting.

In *Our Daily Bread*, there seems to be no difference between the treatment of humans, plants or animals. Of course, this is the very point of the film, to present without commentary how, “[p]eople, animals, crops and machines play a supporting role in the logistics of this system which provides our society’s standard of living” (Geyrhalter 2005). It is left to the viewer to be struck by this complete flattening of

ontological differences in contemporary industrial food production which leaves little space for individualism, human or other. The absence of meaningful human-animal relations and the large scale of industrial production as such do not necessarily contribute to animal suffering or environmental pollution. Our unease over the encounter of animals and mechanization (cf. Giedion 2013) may come not so much from rational concerns over effects that can be measured and minimized. It could even turn out that worries over alienation and meaninglessness are translated into policies and regulations for improving animal welfare and lowering environmental emissions that actually require a further increase of scale and rationalization of production.

We Feed the World (Wagenhofer 2005) shows similar industrial food production processes as *Our Daily Bread*. Again we see fluffy yellow chicks being sorted on fast paced conveyer belts and crops whirling through processing plants. But here this footage is alternated with imagery of small scale forms of agricultural production that are on the brink of extinction. This is a more traditional documentary, in that a number of individuals involved in food production are interviewed on location, and some appear as talking heads. Neither film is in the classical 'muck raking' genre. They do not uncover a scandal in the sense of exposing someone doing illegal acts. Whereas *Our Daily Bread* only emphasized the total loss of agency and even meaning in our food system, *We Feed the World* seems to gesture towards some form of (collective and individual) human agency and responsibility. Some of the humans involved are shown to look back in horror and disgust at their techno-economic achievements: the efficiently attuned plants, animals and machinery. Technological advancement is portrayed as problematic, but here there still is a sense of agents in and 'behind' the system.

From both these films we get a sense that what we could call moral agency of all those involved in our food system is severely restricted due to ingrained economic logics and technological 'scripts'. In view of this, the main questions of this thesis emerge: Where can we situate ethics, where are we to look for ethical subjects? How can we conceive of moral and political agency in our contemporary high-tech food system? And what genres of moral debate and philosophical inquiry are appropriate and helpful (or irritating) to engage with the concerns listed above?

The ethics of consumers?

It now is increasingly common among governments, politicians and policy makers to situate moral (and political) decision making with consumers. A drastic turn of events compared to the days when buying food was considered to lie outside of the sphere of ethics. In a liberal conception of this consumer democracy, consumers first of all have the right that their food meets certain threshold levels of product standards on which an 'overlapping consensus' exists as to what would be minimally required for moral consumption (Beekman 2008). This means that all the food that we can buy should accord with moral standards on which we in our society tend to agree. For instance: that animals have not been treated unnecessarily cruel and are killed as 'humanely' as possible. Beyond these minimum standards on which we can agree in a political process that results in legal requirements, consumers can be considered to have a right to adequate product information and an appropriate range of available foodstuffs, so that they can exercise their market autonomy and make informed choices based on personal moral convictions. This would allow them the freedom to follow their own lifestyle and generate moral identities. In this way, emotional responses to food (Beekman 2006) and the role of trust in food production can be taken seriously in informing and contributing to debates on agricultural issues (Brom et al. 2006; De Krom and Mol 2010).

For others the idea of 'ethics in an age of consumers' (Bauman 2009) is not a very hopeful prospect. Consumers in this view are not autonomous beings expressing their worldviews and crafting a meaningful lifestyle through their consumptive choices. Instead, they come across as mindless hedonistic individuals, mere vectors of successful marketing campaigns, driven by bodily cravings and unreflective desires for conspicuous consumption (Barber 2008). The market, filled with these kinds of (a-)moral subjects, is not where true political debate happens, where people come to express their ideas and reflect on alternatives. Defining what could also be called political issues –especially those that potentially involve global environmental catastrophe and wide spread suffering– as matters of individual consumer action, precludes more concerted efforts aiming to more imaginatively change policies and institutions (Maniates 2001). Still others believe though that multinational corporations spurred on by activist NGOs and catering to (latent) consumer demand can be a productive source of societal improvement and even moral progress. Wherever the decisions are thought best to be made on the ethics of our food –in national parliaments, in global trade negotiations, in supranational bodies such as the European Commission, in executive board rooms of

multinationals, in scientific committees, or by consumers in supermarkets– there is one place which is mostly taken for granted: the farm.

Ethical agency on the farm

Perhaps when abolition of all animal use for food production would be the ultimate aim, situating the ethics of animal farming in the supermarket and the parliament, with consumers and citizens, perhaps corporations, NGOs and policy makers, would make sense. But when the issue is improvement of the practice of farming, it is rather strange if farmers are not considered to be relevant figures. Not just for being the ones to implement the improvements thought up by scientists and ethicists, but also as, at least to some extent, having relevant knowledge and practical experience with making moral judgments.

From the perspective of the agents, for instance the farmers themselves, their moral subjectivity emerges in relation to the extent to which they experience some form of ‘ethical room for manoeuvre’ (Korthals 2008; Pompe and Korthals 2010). This involves the perceived ability to meaningfully respond to their situations and to engage in learning processes, including some power to implement, or publicly debate, what they find the morally most appealing outcome of these learning processes.

This thesis will explore what forms ethics can have in a technological culture and what type of moral subjects and political practices can be discerned in contemporary animal production. In this study, not a particular kind of autonomous moral agent is assumed, nor idealized. Instead, it consists of a series of attempts of interpreting how, in practice, particular forms of moral subjectivity can be seen to emerge, especially in situations of technological change. But how to understand what happens in processes of ethical contemplation and deliberation?

1.4 Applied ethics as a genre, or how to do ethics when ethics is also (material) culture?

At the end of the nineteenth century, a genre of ethics and a style of ethical writing emerged that was modelled on the rigour, order and certainty associated with mathematics (Toulmin 1982). If currently we reflect on moral issues, still the common academic ideal is that these matters are approached in the rational and

sober style of ethical theorizing.⁵ Thus it is often assumed, at least among those professionally working in the field of moral philosophy, that a particular kind of writing is its appropriate genre: in order to find out what is the right thing to do, what we need is to develop arguments in terms of general values and principles and consistently derive conclusions on what these could entail for particular situations. Applied ethics as a field of research moreover tends to be geared towards a certain type of institutional interventions –procedures, protocols, ethics committees, policy advice– that imply a specific understanding of what it means to engage in ethics: the systematic, rational and conceptually clear reflection on what is right and wrong. All this in a reasonable discussion aimed at reaching consensus, if not on the right policies, then at least on the meanings of the core concepts used in these discussions. Though these efforts can be valuable, especially in clearly institutionalized environments such as the practice of medicine or the drafting of governmental regulations, even there these approaches have their limitations in bringing forward everything that one may think of as relevant in deciding what to do (Steinkamp and Gordijn 2003). But to use this model to discuss societal concerns, such as those around food production, risks severely limiting the repertoire of debate and reflection on what can be considered the defining issues of our time.

When the mosaic of concerns sketched at the beginning of this chapter is seen as a set of dilemmas to be formalized, analysed and decided upon in terms of common ethical theories, a particular form of what it means to engage with these issues is chosen. Then, the ethics of animal agriculture may amount to weighing the economic and environmental efficiency of fast growing broilers (now called *plofkoppen* in Dutch) against their suffering from being bred to grow a breast too heavy for their legs to carry. Or, in this dilemma framework, we could weigh the welfare benefits of free grazing animals against the reduction in environmental emissions that can be attained by keeping them indoors (Korthals 2012). But if we limit ourselves to this understanding of what ethics is, we would miss out on a much broader repertoire of engaging with issues. In relegating these issues to ethical experts, we easily contribute to depoliticizing controversies and even ‘silencing ethics’ (Poort, Holmberg, and Ideland 2013). Especially would we run the danger of

⁵ We tend (in public at least) to no longer look for religious guidance in moral issues; the bible or other religious books provide (in a predominantly secular country such as the Netherlands) only for some minorities prescriptions on what to eat and how to produce this food. Which in fact is not to say that religious beliefs play no role in the ethics of farmers, as a significant portion of them also in the Netherlands do derive practical norms and motivations from religion.

missing out on what makes ethics valuable for many; what motivates broad swaths of people to care about things, and how these motivations might inform more radical and creative ways of dealing with what otherwise remain static and conveniently delineated dilemmas.

Animal Liberation

The most prominent work in moral philosophy on the use of animals is Peter Singer's *Animal Liberation* (1975). In fact, this is the defining book that turned what we now call *animal ethics* into a respectable philosophical sub-discipline. Mostly, *Animal Liberation* is considered to be a philosophy book, in which Singer applies a utilitarian ethical theory to the use of animals for food production and laboratory research. This is at least how it has been received in the philosophical literature that emerged in its wake. Ethicists ever since have been debating the theoretical intricacies of the reasons why we should grant moral status to animals – according to Singer for their suffering as sentient beings. But when we look at this accessibly written bestselling book, it contains much more than what is normally considered to comprise a philosophical argument (cf. Coeckelbergh 2012, 29).

Already in the (original) preface it was stated that the book meant to “arouse emotions of anger and outrage”, rather than just convey a reasonable position. (Of course, it could be argued that also an unemotional argument describing conditions of animal use could arouse emotions, perhaps even more effectively.) Besides listing the numbers of animals involved and the effects of rearing conditions as explained by biologists and environmental scientists, the book offers vivid descriptions of what happens on farms. These were based on industry reports as well as on visits to intensive farms that Singer made researching the book. He explicitly aimed to expose what he calls the ‘cruelty and mindlessness’ of the ways in which animals were treated. The first edition even contained numerous photographs with gruesome imagery of the animals in intensive farms and laboratories, and it concluded with recipes and contact information of vegetarian organizations. Most parts of the book, likely the most compelling segments for many people, are in a style remarkably similar to that of the highly personal recent bestseller by literary author Safran Foer (2010).⁶ Viewed from the discipline of moral philosophy, Singer

⁶ Foer himself has studied philosophy at Princeton (perhaps even taking classes with Singer?) and he explains that during that time he became a vegetarian again. After previously having been vegetarian as part of crafting

thus wrote a muddle of a book, mixing genres and forms of reasoning, constantly alternating rhetoric with reason, evocative descriptions with philosophical analysis.⁷ But thereby in one move he managed to achieve two remarkable things: first of all, to lend the intellectual status of (moral) philosophy to the animal cause by creating animal ethics as an academic field, explicitly opposed to mere idiosyncratic concerns of overly sentimental humans (Baker 2000, 176; McKenna and Light 2004, 38). While, at the same time, it promoted the idea that ethics is not just an ivory tower pursuit, but could even incite political action and inspire social movements.

For ethics to have broad societal impact, apparently it is best combined with, or expressed in, a very different style of writing than what moral philosophers generally produce or how they formally idealize normative discussion. Moreover, one could argue that the academic debates in animal ethics which erupted during the subsequent decades after *Animal Liberation* were only marginally relevant to the reforms that the book helped to put on the agenda. Public debates on animal welfare were mostly propelled by activist NGOs, biologists, and journalists. This is not to say that sophisticated (and even philosophically informed) critiques of animal farming practices have not an important role to play, but that the genre and style in which philosophers applying themselves to the task are to express their contributions is not self evidently that of current strands of academic ethics.

The genre of moral change

One could argue that this playing on emotions is all very well to evoke a broad public response. But to actually find out what then ought to be done, one should have a rational debate based not only on solid facts but also on formalized values and universal principles. In this ideal of a moral debate, a clear distinction is presupposed between rational arguments and rhetoric, whereby the main task at

an adolescent identity, this time it was because “I thought that life could, should, and must conform to the mold of reason. You can imagine how annoying this made me” (Foer 2010, 8).

⁷ The more evocative parts of *Animal Liberation* are also comparable in style and tone to Ruth Harrison’s *Animal Machines*, which had influenced Singer in engaging with the issue of intensive farming, and Rachel Carson’s *Silent Spring* (2002), which had rocked agricultural industries in the early 1960s by exposing the ecological effects of pesticides such as DDT. That book can be considered ground breaking also for the way it sought to mobilize what were previously deemed private feelings into new (counter-) cultural forms of political action (Lockwood 2012).

hand is to sort out the former to properly guide our actions and do away with the latter as distorting our true moral duties. This could be taken to mean that we can still think of decision making on what is morally right as situated ultimately at the level of rigorous systematic thought with universalist aspirations, deriving action-prescribing maxims from basic principles. For properly rational and autonomous moral agents this should be enough to then act accordingly. It is only when we need to motivate the more rationally challenged ethical laypersons to do the right thing (as established by the findings of the ethicists) that we may focus on whether and how to force, nudge or perhaps even use every trick from the book of persuasion.

But is this an appealing approach, to understand not only how societies but also individuals come to be convinced of the importance and urgency of particular concerns? As J.M. Coetzee remarked:

“We [...] are where we are today not because once upon a time we read a book that convinced us that there was a flaw in the thinking underlying the way that we, collectively, treat non-human animals, but because in each of us there took place something like a conversion experience, which, being educated people who place a premium on rationality, we then proceeded to seek backing for in the writings of thinkers and philosophers.” (Coetzee 2009, 89)

So, at some stage, philosophical writings can be influential in helping more theoretically inclined moral subjects to fashion a particular moral self. But this functions as part of a wider set of (according to Coetzee preceding) influences, that includes also broader cultural, economic and technological developments.⁸

Apart from seeing these (alternative) ethical genres as detailing a type of highly personal conversion experience, a very different understanding of this form of ethics could emphasize its shared, collective, and cultural character. Ethical reflection and debate do not occur in a vacuum. Besides involving power struggles

⁸ One of the best known examples in environmental ethics of such a conversion experience - and the subsequent communication of it as an evocative argument in favour of a new form of relating to nature and the land - is that of Aldo Leopold. In his posthumous bestseller *A Sand County Almanac* he recalls to ‘watch a green fire die’ in the eyes of a wolf he had just shot (Leopold 2001). An experience he had turned into an ethical argument more than thirty years after the event, contemplating it in the light of the emergent science of ecology and influenced by wider cultural shifts.

between interested parties, as well as reasoned exchange of arguments, they are also influenced by societal events, institutional developments and cultural commitments. With e.g. Margo Trappenburg (2003) we could stress how these different understandings of what happens in ethical debates all may have some explanatory power. According to her, an *evolutionary* perspective on ethical debates, which does not approach these in isolation from wider societal and technological developments, helps to emphasize the relevance of broader contexts of debates. These contexts may influence particular path dependencies and hidden patterns that are often only recognized in hindsight. Scientific and technological developments can then be considered part of this context of ethics, contributing to routes and patterns that promote particular framings of moral issues.

The co-evolution of this and that?

How to conceive of the relations between ethics and technological change? Both technological determinism as well as the ‘neutral tool’ model of understanding the relations between technology and society no longer carry much appeal.⁹ Our lives, our economic development, let alone our thinking, are not just the product of technological progress seen as a singular and materially determined force. And at the same time it is broadly acknowledged that technologies are not just neutral means at our disposal, mere useful tools to achieve aims we decided upon independently. The developmental pathways of particular technological systems do influence the opportunities we have, and perhaps this influence goes even further. But the quest for one-way causal explanations regarding societal and technological change has mostly been disbanded.

It may be tempting to imagine separate entities –technological artefacts and something we call ethics– and draw arrows of causal interaction between them. But what seems to be more likely, and eventually more interesting, is that we could posit an ontologically more complex intertwining, made up of less clear-cut objects and subjects.¹⁰ The advantage of the *co-evolution* metaphor to describe the “co-

⁹ Apart from the critical documentaries described earlier that seemed to profess forms of technological determinism.

¹⁰ As Verbeek has argued on technological mediation, incorporating Latourian ideas within ‘post-phenomenology’, humans themselves are transformed by the process of technological mediation. “Mediation,” he says, “does not take place between a subject and an object, but rather co-shapes subjectivity and objectivity” (Verbeek 2005, 130). Indeed, as Haraway has put forward, also in response to the work of

shaping of technology and society” and “socio-technical” (Bijker and Law 1992) or “techno-moral change” (Swierstra, Stemerding, and Boenink 2009) is that it can be taken to highlight how also what is meant by ethics and by technology is dynamic, just as the distinction between organisms and their environment is not clear-cut. But how then to study this relation of mutual influence between this and that, when this and that are not separate entities? Considering the extent that everything thus appears to be in flux, it becomes clear that also the boundaries of the social and the material, what we think as ethics and what as technology, are the outcome of the very processes which this thesis focuses on. Ethics is then also a matter of *boundary work*, of arguments and struggles over the institutional, practical and conceptual demarcation of different societal domains.¹¹ This boundary work is both a process to describe and to intervene in, for instance by proposing alternative practical understandings of sharply delineated conceptual oppositions (Keulartz 2009). How to consider the role and status of reasoned argument in this dynamic co-evolutionary process?

Empirical and normative ethics?

Many have argued that how people actually behave or how they in fact come to change their mind is, or should be, irrelevant to the choices people are to make. Within the academic field of ethics it is therefore commonplace to start analysis by distinguishing facts from values, description from prescription, is from ought. This kind of strictly delineating analytical work in ethics can be important to show how reflection can be systematized and arguments can be analysed in terms of the meanings of central concepts. And it may help to explain, perhaps even hoping to justify, the choices one makes. But if ethics as a genre of research is to make any sense to those ‘in the field’, it seems rather obvious to have an interest in experiences of those who will need to implement the outcomes of ethical analysis. That this actually makes for a “turn” (Borry, Schotsmans, and Dierickx 2005) raises worries over the unworldliness of much academic ethics.

lhde: “Human bodies and technologies cohabit each other in relation to particular projects or lifeworlds” (Haraway 2008, 262).

¹¹ The notion of boundary work was coined by Thomas Gieryn (1983) to describe the processes of demarcation between what is science and what is non-scientific. It has subsequently become a popular term in philosophy and social sciences to direct attention to various other processes of institutional delineation. In this thesis the notion is not prominent, but the underlying idea of boundaries that are not to be assumed as given but as both the site and means of contestation is one of the starting points of the research.

In recent years, a strand of ethical inquiry emerged that has been labelled *empirical ethics* (Borry and Schotsmans 2004; Dunn and Ives 2009; Musschenga 2005), which intends to be both descriptive and normative. It does so, first of all, by emphasizing and increasing the context sensitivity of moral reasoning. One of the things thus revealed, e.g. by studies in medical anthropology, is that in practice decisions tend to be the outcome of collective and ongoing processes rather than momentary choices made by isolated individuals (Musschenga 2005). Common theoretical conceptions of what it means to do ethics may dismiss this as all the more reason for formal training in ethics for practitioners, or the public at large. Nijssingh and Düwell for instance have discussed possible ways to understand the relevance of interdisciplinary social science research to ethics. According to them, one of the uncontroversial ways in which research into the arguments people actually bring forward is for the ethicist to “have access to the whole range of possible argumentation” (Nijssingh and Düwell 2009, 87). The trouble with this conception is that it sees ethics as an activity performed by ethicists. Instead, this thesis argues, it is ‘the public’ that should have ‘access’ to the whole range of arguments. And (in a pragmatist understanding of ethics clearly) that access is likely to involve lived experiences and prolonged interaction with the situation at hand; something different from social science data on opinions, preferences, attitudes, and the like.¹² It is not up to the ethicist to determine whether to include forms of ethical reasoning of the wider public as input to the ethical decision making process. Instead, I would argue, ethical analysis and theorizing are only relevant if they manage to somehow be broadly convincing or otherwise helpful (or disconcerting) to members of that wider public.

When ethics is about making real life (often communally embedded) choices as part of lived experience, not decision making based on facts and principles, much of the interesting action is in generating alternative interpretations of a situation and conceiving of possible roles in it. Whether it is through theoretical analysis or some other form of interpretive intervention, the work of ethics can be thought of as rousing the public into rethinking what they assumed as unproblematic and proposing new ways to relate to moral experiences of problematic situations. This is an activity for which it is not so obvious that theoretically informed moral philosophy texts are the most appropriate genre.

¹² Moreover, it is important to note how this type of (quantitative) social science research produces its own particular moral and political subject; see for instance Law (2009).

Bringing ethical theories to the farm?

As the proverbial ‘man with the hammer to whom everything looks like a nail’, it is my experience that the baggage of standard-issue ethical theories which an ethicist brings along leads one to look for particular types of cases. Cases on which say the utilitarian and deontological approaches map well. The task this ethicist takes on is then to reframe the ethical conundrums of real life problematic situations into abstractly systematizable dilemmas. Instead, after going to farms, talking to farmers, and not being helped much by ethical theories to redescribe their concerns in interesting ways, I chose not to blame the farmers, nor my limited grasp of these theories. The contextualism or pragmatism I find myself advocating here is in part motivated by a procedural concern, that when one claims to do ethical research that is relevant to the issue that is studied, one should aim not just to inform (and involve!) policy- or other decision makers, but also those that will be affected by the decisions and policies being made. If ethics is not to be an ivory tower technical discipline of the kind that people on the ground only need to know the outcome of and not how this outcome was achieved, this process of ethical reflection should be publicly accessible in both the material and the intellectual sense.

If there still is a role for theoretical systematization, is what I claim not just the same as in a *reflective equilibrium* where one reiterates between an intuitive sense of what is the right thing to do in a particular situation and theoretical formalizations of what this would mean when justified more universally? That approach is indeed a way to acknowledge the role of intuitions in moral reasoning; and it can be used to explicate the character of ethics as a social process. This process may contribute to ethical reflection in attempts to formulate more general moral ideals and commitments that transcend the situation at hand. But this type of approach tends to emphasize a particular systematically ordered form of reason; a theoretically informed mode of producing universally valid arguments. Offering more general justifications for one’s actions allows these to be critiqued; and may help us to develop ideas on what we think is right and wrong in a shared process of reflection. But if justification is not deemed to provide foundations anyway, and may even include more than strictly rational reasons, a much wider range of concerns, intuitions, and sensibilities can be brought to the fore.

Rather than right away aim to sort out the reasonable arguments from the emotional inclinations and situated experiences, this thesis is written in the vein of *romantic pragmatism*. This *poetic* strand in pragmatist philosophy emphasizes the

creative and *world disclosive* character of thought, besides the rational, *prosaic*, problem solving orientation that pragmatism is known for (Keulartz et al. 2002). Thereby, this research project starts from a sense of the *constructedness* and *enacted* character of each element in the process of reflective equilibrium: moral intuitions, scientific facts, and ethical theorizing are all three not to be taken at face value. The aim is to also unsettle rather than only establish moral ideals, and to open up the formation of scientific facts and of moral subjects that have intuitions.

What this thesis proposes to do is both less and more than common claims in normative ethics. Less, as it does not and cannot claim to actually 'solve' moral problems, to produce the final compelling argument on what to do. And more, as it involves questioning and experimenting with the very genre of how to discuss particular moral issues.

In pragmatist approaches to ethics, it is argued that the experience of concrete problems forces us to rethink habits. Consistency in relation to ethical theories is not the only mode to deal with the complexity of moral life. In a way that is akin to forms of *virtue ethics*¹³, many ethical questions can be seen to come down to what kind of person, e.g. what kind of farmer to be, or what kind of community we want to live in; and what do we feel is an appropriate way of using land and of relating to animals? Identity formation in concrete situations and the realization of what we come to think of as *the good life*, in this view are central to ethics. This involves crafting relations with human and non-human others, as well as pragmatic resolution of conflicts and the striving for collective ideals. This different mode of becoming ethical, of rethinking our habits, often happens through other media, in different cultural genres than moral philosophy. As Dewey has argued:

'The sum total of the effect of all reflective treatises on morals is insignificant in comparison with the influence of architecture, novel, drama, on life' (Dewey 2005, 359).

¹³ An extensive discussion with virtue ethics is lacking in this thesis. Modern virtue ethics such as the version of MacIntyre (2013) is less essentialist regarding the nature of human morality than its Aristotelian inspiration, and it offers a way to appreciate the cultural and changing character of moral norms. And especially more recent forms of environmental virtue ethics (Sandler and Cafaro 2005; Coeckelbergh 2012) that acknowledge the precarious and embedded nature of moral subject formation may constitute a fruitful resource to further explorations of ethics on the farm.

But what would it mean, if the arts not just have more ‘influence’ on us, but when we can actually consider this as rightfully so, for being an important form of reflection and deliberation? And does this mean reasoned discussions of our moral duties are somehow detracting from what are more truly *real* and *direct* emotional responses and cultural practices? Not necessarily, so it seems. These intuitive and emotionally laden forms of responding ethically are also, at least in part, the outcome of particular ways in which we fashion ourselves, and are being fashioned, to become ethical. For instance Lynn Hunt has described in detail how the declaration of and enthusiasm for universal human rights coincided with the emergence of the genre of the novel. This was a new ‘technology’ for sentimental indulgence, by which people throughout society acculturated themselves with the subjective experiences of imaginary others. The genre helped produce a new empathic novel reading moral subject. Thereby human rights, “are not just a doctrine formulated in documents; they rest on a disposition towards other people, a set of convictions about what people are like and how they know right and wrong in the secular world” (Hunt 2008, 27).

Thus, this type of promoting particular forms of moral subjectivity can be considered as merely another and partly complementary version of the more theoretically explicit ways in which Kantians and utilitarians try to make us into particular varieties of essentially rational agents. (Thought to be historically preceded by the emotional revolution set off by the novelists.) These too are efforts to change what it means to be a moral subject, though by claiming this is what we necessarily are, or should be, as rational beings. This implies that the different understandings of ethics do not merely complement each other, but can also be thought to be somewhat mutually exclusive, or even undercut each other. As Martin Drenthen claimed, while arguing for a ‘place based’ environmental ethics when discussing projects to create new nature in the Netherlands:

“Modernist environmental ethics demands that humans distance themselves as much as possible from their own partiality in order to transcend their ‘speciesist rationality’ and ‘human chauvinism’; they should become ‘abstract’, so to speak, and adopt an ‘objective’ outlook on life. Modern environmental ethics implies a type of intellectual reflection that transforms people into displaced, abstract, disembodied persons” (Drenthen 2009, 206).

Thus, the highly particular (rational, abstract, objective) moral subject that comes with the commonly promoted genre of philosophical ethics is meant to dismantle the more encumbered, embodied and embedded selves of contextualist or practice based ethics. An appeal to moral theorizing in abstraction of concrete situations and relations is in many instances not just 'one thought too many', as Bernard Williams argued in the face of whether to save either your drowning wife or a drowning stranger (Williams 1981, 18). But it may even be detrimental to self understandings aimed at actively seeking out and cultivating more directly meaningful moral experiences.

This is not to say there is no place for attempts to achieve a bit more impartiality, universality and rationality in engaging with moral concerns. Affective encounters are not the only relevant form of reflection on tacitly accepted daily routines. Turning to concrete agricultural practices again, the question comes up to what extent contemporary farmers still are connected to place; and is their ethics guided by direct experiences, or (also) more abstract commitments to 'feeding the world'? Can they claim 'premodern' modes of relating to their land, animals, etc., as idealized for instance by John Berger (1980)? And if so, could there also be some role for active moral reflection in this competing 'pre-theoretical' mode of ethics? As part of this dynamic process in which individuals are emergent, one may in terms of the romantic strand of pragmatism, "see agency as a matter of what we let ourselves be affected by, rather than a matter of exercising control over what we encounter" (Kompridis 2006, 5). However circular or bootstrapping this may sound, it does offer a way to understand moral reflection without the need to find some external Archimedean point from which to decide what kind of subject to become. This points to an understanding of ethics as an ongoing process, and a role for ethicists (and others) to create opportunities for people to allow themselves to be in new ways affected by things and situations.

The books and films discussed earlier are then an expression and public articulation of particular experiences of themes such as industrial farming and environmental destruction. The mere listing of all the problems associated with animal farming, as provided at the beginning of this chapter, is not likely to have turned the reader – yes, you – into a different moral person yet. Something more would be needed, and as this thesis will claim: this is the case not just for motivating broad groups to change their ways, but also to find out what is best to be done and how to understand what is at stake.

Pragmatist ethics beyond facts and values

This thesis offers an attempt at pragmatist ethics, in which the difference between descriptive and normative ethics is less clear and of less interest. The distinction between description and normative argument dissolves in pragmatist understandings of ethics, since responding to particular situations and occasions are a matter of interpretation and re-description, without claiming to offer the final description of moral reality as it truly is. Thus, as an analysis of practices of animal production, this thesis claims to do nothing more than add a particular interpretation of a problematic situation to an ongoing conversation amongst those involved or interested. Perhaps the main difference with other approaches is then how to go about, where to start. Within the (romantic) pragmatism as I took it up, this meant spending time with farmers and taking a practitioner's course in dairy farming, rather than studying the pragmatist classics and distilling John Dewey's or William James's views on farming (cf. McKenna and Light 2004).

A pragmatist approach to ethics directs us to pay attention to the particular kind of work that more abstract, universalizing forms of ethics actually do, in practice. Then, the kind of language used in ethics becomes in a different way highly important. Not just for being univocal and unambiguous, logically coherent and rational, as those practicing the more established academic form of ethics would strive for. Also the broader effects of particular styles of writing are interesting. When viewed in this performative way, the common type of abstract and precise theoretical language that is rather inaccessible to a lay audience implicitly says ethics is a form of academic expertise. Instead, a pragmatist such as Dewey emphasized how ethics is a matter of experiential learning and moral imagination, thereby starting from a very different idea of what makes a moral subject. Steven Fesmire has, with Dewey, argued against the split between social sciences, psychology and ethics. Since it is in our moral imagination where and how ethics happens; whereas the question "How do human beings actually make sense of their moral experience?" (Fesmire 1999, 527) has been ignored by most philosophers interested in normative theories.

Pragmatism, especially in its romantic variety, stresses the importance of creatively imagining future possibilities and the production of 'thick descriptions' to try and experience alternative worlds (Keulartz et al. 2004). This involves disbanding universalist tendencies in justifying substantive moral positions. Richard Rorty has argued that when poetry took over the role of religious dogma, this involved a shift from monotheism to an inherently pluralist understanding of ethics: "whereas there

can be many great poems, there can be only one true religion, because only one true God. Poetry cannot be a substitute for a monotheistic religion, but it can serve the purposes of a secular version of polytheism” (Rorty 1998, 22). In this thesis I will consider how today other genres besides poetry can be thought of to provide modes of interpreting, crafting, unsettling and communicating moral experiences of our world.

Symmetrical study of ethics and politics

When we are interested in understanding the ways and forms in which ethical reflection and political deliberation take place, we should better not at the outset already define what is ethical and political and what not. As it is this very distinction, between a reasonable argument and rhetorical trickery, between a legitimate position and whimsical or mindless habitual behaviour, is part of what is at stake. This methodological principle of *symmetry* for studying politics and ethics is akin to how in *actor-network theory* (ANT) the emergence of scientific facts or successful technologies is to be considered. According to this idea of symmetry, one cannot explain what comes to be understood as a scientific fact or as technologically feasible in terms of an underlying *given* reality of natural facts and technological possibilities (Latour 1993). In contrast to classic forms of ANT-inspired research, this does not necessarily mean we should remain agnostic about or even ignore the substantive ethical claims that various people put forward in the processes in which they enact their worlds, to only discern actors attempting to align the interests of others with those of themselves. When also these actors and their interests are in flux and not easily delineated from their non-human surroundings, in ‘following them’ we should be prepared to see them dissolve or reassemble in surprising ways. Thereby the seemingly easy dismissals of ethical discussions in terms of ‘everything is subjective’ or ‘people just strive after their own interests’ then appears as already claiming a lot: that there are self evident subjects equipped with a perspectival view and well defined outlooks.

It may be appealing to consider the different versions of what happens in technomoral change as different ‘perspectives’ on what is actually the same reality. Especially within *science and technology studies* (STS) however, e.g. recently by Woolgar and Lezaun (2013), it has been argued that this would imply that these different modes of understanding the world leave that world essentially unchanged. Instead, within this type of self proclaimed *ontological* strand of STS, the world is multiple, and constantly performed (Mol 1999). This also undercuts an easy approach to *value pluralism* as just a matter of charting and comparing attitudes,

interests, opinions, and other characteristics that considers individuals as subjective and essentially private beings. What we find instead can be called *ontological politics*, “a politics that has to do with the way in which problems are trained, bodies are shaped, and lives are pushed and pulled into one shape or another” (Mol 2002, viii). Or a similar *cosmopolitics* that involves entertaining the “possibility that agency, creativity, morality, and all those things that are normally associated with human minds might well have more to them than ‘home alone’ minds” (Hinchliffe et al. 2005, 644). Thus promoting ideas of agency, creativity and morality as phenomena to be situated in (and distributed over) partly embodied and culturally embedded material practices. What these versions of public contestation imply is that what we will need to do is study (and thus try to intervene in!) the worlds evoked and performed in discourses and material practices, before too quickly defining and discerning individual moral subjects. This then is not just an irresponsible dilution of these individual moral subjects that are the cornerstone of any ethical theory, but an attempt to study and promote forms of ethics that acknowledge their co-evolutionary character.

1.5 Outline

What, where and how to think of farming with animals?

So far I have argued that it would be good to move the focus of our attention in ethics somewhat: from ‘what to decide’ to ‘where to decide’. How can we understand ethical contemplation in more situated and contextual ways, while also rethinking what it means to debate and what to consider as appropriate arguments? After acknowledging the mosaic and dynamic character of ethical concerns, how are we to understand this co-evolution of ethics with technological change, and how to think of doing ethics and politics in such a situation of socio-material flux? Or, more concretely: How can we go about to look for ethics on the farm? This thesis reports on a series of sites and situations which I tried to somehow describe and intervene in. This empirical approach to ethics at times is done in an ethnographic style in which the author is somewhat present. It involves reflecting on words used by actors themselves, but also a look at embodied behaviours, and other ways to highlight the significance of the everyday and the importance of meaning and culture. The research did not start from ideas of clear-cut moral subjects and from assumptions on what make for rational arguments, since the aim is to trace how these boundaries and definitions emerge.

This thesis is not a sandwich of separate theoretical and empirical parts. The chapters below describe specific empirical cases in relation to particular sets of literatures. These literatures and theories are not so much 'applied' to cases of animal farming, but rather more loosely inform ways to delve into them. Each chapter involved a different approach, not just in terms of the literature it is in conversation with, but also for the role of efforts to gather empirical material. Broadly speaking, one could say the consecutive chapters move towards ever closer involvement with technological design projects; thereby also moving from attempts at being an 'invisible' observer in public debates and on farms, to a more and more active presence of intervening in these debates.

Part I

The thesis comes in four parts. Part I sets off to study ways of conceiving ethics (and politics) on, and then beyond, the farm.

Chapter 2: how to interpret ethics on a farm?

Two things are remarkable in public thought and policy making on farming issues. Firstly the rather striking absence of farmers in public debates on themes that affect them and in which they play central roles in practice: from food safety, environmental concerns and especially animal (welfare) issues. And secondly, a lingering sense that (some) farmers still do have a valuable moral outlook informed by moral experiences that urbanites do not have access to anymore: performing honest work to produce our food, in some ways still connected to their land and animals. The figure of the farmer brings an aura of sincerity and truthfulness that is cultivated and romanticized in TV shows as wide ranging as *The Simple Life* in the US (Redmalm 2013) or *Farmer Seeks Wife* in the Netherlands. The upcoming chapter engages with this paradox, and from a series of ethnographically interpreted encounters with farmers and their material practices and discourses, a framework is proposed from which to understand and elaborate the variegated kinds of moral expertise they may bring to such a discussion. To inform this chapter I have sought various excuses to spend time on farms – by going on farm visits with vocational students, learning to milk cows in a weeklong course for young dairy farmers and helping out animal scientists in measuring pig welfare conditions. From these encounters I tried to formalize the positions and experiences of farmers in terms of the sociology of value and argumentation developed by Boltanski and Thevenot, which I amended and extended into a framework for moral ethnography.

Chapter 3: can we do away with farmers?

The subsequent chapter describes two highly technological projects that both propose to do away with all the local contextual choices and dilemmas and solve the entire ethical conundrum of animal production in a single integrated technological vision. An *'agroproduction park'* has been projected to house tens of thousands of pigs in a single facility, allowing the integration of substance cycles in an *'industrial ecology'*. The proposal came to be publicly named *'varkensflat'*, and instantly drew a storm of critique. That meant the abandonment of the project and even the widespread refusal to seriously debate the advantages of this idea. Quite the opposite happened with the proposal to develop *'in vitro meat'*. Even though some people report an (initial) repulsive bodily response, most public reactions in the Netherlands and abroad welcome this biotechnological solution to the problems associated with animal farming. This chapter does not provide a traditional technology assessment of these ideas, estimating their potential impacts as compared to contemporary animal production systems. Instead, the focus is on what these proposals actually did to the debates around currently existing farm practices. I describe how these designs functioned as material scenarios that drew together particular actors and generated new arguments. Thereby this chapter argues against the common idea in the philosophy of technology and political theory that technological development is a problem for democracy. These spectacular technological proposals actually provide interesting occasions for deliberation *'in the wild'*, where a wide variety of people come together and find themselves discussing deadlocked issues in new and imaginative ways. This process I traced in research documents and visual designs, by studying responses to these proposals in public media and by witnessing public events in which these technologies were discussed. Besides contemporary developments in STS and work in *'bioart'*, this chapter draws on Dewey and Heidegger to chart the kinds of reasoning that emerge around these technological designs.

Part II

After this discussion of two technologies proposing to do away with (independent) farmers, in part II we move back into the field (and the barn) to ask how co-evolution of techno-moral change occurs not just in public debates around spectacular technological designs, but also in everyday material practices on the farm. The technology that is the focus of this part is the *'milking robot'*, of which both the ethical and political character is described.

Chapter 4: how does ethics co-evolve with technology on a dairy farm?

Chapter 4 starts from the question: how can we engage in technology assessment and ethical debate in a dynamic world? In this chapter, farmers are much more prominent moral actors again. This may seem strange, since the fully automated milking robot that is the subject of this chapter is meant to 'replace' the farmer, at least in the process of milking the cows. The emergence of this robot as a viable technology is described in relation to changes in the practices of both farmers and cows, amounting to a form of multispecies ethnography informed by an understanding of socio-technical change in Actor Network Theory and work in STS more broadly. Here the recurring question of how we can still do ethics in a world full of hybrid beings –in this case particular cow-robot-farmer assemblages– is taken up in conversation with recent work in rural sociology and geography on the challenges of 'implementing' animal welfare. This chapter is based on professional farming media, industry reports, farm visits, discussions I witnessed amongst farmers, and on my experiences in the practical training course to become a dairy farmer, in which both conventional and robotic milking technologies were taught.

Chapter 5: can tinkering with technology be deliberating with animals?

Can technology development on the farm be considered a form of deliberating with animals? The next chapter, 5, goes on to ask how we can take not just farmers but also animals more seriously as participants in processes of techno-moral change. I continue with the example of the milking robot, but focus more closely on an attempt of a small group of farmers and technologists (and cows) to create a mobile, field based version of it. Close involvement with this group enabled a detailed description of the everyday co-evolution of technologically mediated human-animal relations in the making. This in turn allowed for a view of human-animal interaction during the design process as a form of deliberation, which may be granted political status. Hereby, this chapter becomes an attempt to see how far our understandings of what is political –and even what is deliberative– can be stretched to include a wider set of practices and forms of communication. Thereby extending the public sphere in which to deliberate on ethical concerns to include not just farmers, but also animals. This argument draws on recent work in STS and 'more-than-human' geography dealing with the material character of politics, in combination with political theory on deliberative democracy and recent proposals for understanding our relations with animals as political rather than ethical.

Intermezzo: what else can a philosopher contribute to animal deliberation on the farm?

Again, the author finds himself in a situation with a group of farmers, this time at a dairy farm with the members of the network that was convened around the mobile milking robot. Rather than offering conceptual analysis and trying to make the farmers internalize particular notions to understand what they are doing, I ended up experimenting with a different, more imaginative and visual approach. Halfway through the thesis, this experience seems like a defining step in the search for alternative genres of intervening in ethical discussions on the farm.

Part III

Part III brings the previous findings together and takes them again a step further. When ethics co-evolves with new technologies, and deliberative politics with animals occurs in material design, why stick to merely describing these processes? Political debate and ethical inquiry can then also be done by an actual design intervention that is philosophically well thought through. Chapters 6, 7 and 8 report on a design project I have initiated in close collaboration with a group of designers to create a new agricultural technology: an interspecies video game.

Chapter 6: why not set up a design project to deliberate with bored pigs?

Chapter 6 starts by describing the situation of intensively farmed pigs, whose boredom has been formally recognized by the European Union prescribing farmers to provide them with something to play with. It then goes on to outline the considerations in the background of the design project to relate consumers in new ways with life on the farm. By framing the question in terms of John Berger's work on modernity and the loss of meaning in relating to farm animals –'only pets and carcasses remain'– this chapter returns to the question of chapter 2: how to understand modern farmers and their 'mixed motives'. The design project to create *Pig Chase* is explicitly aimed to function as a 'boundary object', connecting the life worlds of farmers, pigs and wider publics in new ways.

Chapter 7: how best to play with pigs?

In chapter 7, the philosophical and scientific debates that informed this design project are discussed in the light of our experiences with farmers and pigs during the making of the game. The project involved meetings with farmers to discuss possible designs, and design sessions and prototype testing on a pig farm, and eventually also actively promoting and explaining this project in professional and

public media. This material form of philosophical reflection was informed by the emerging trans-disciplinary field that is now called 'animal studies', in which in a self evident way historical and ethnographic work is combined with animal science research and philosophical debates on how to understand human-animal relations. In this chapter this work, including Montaigne's famously playful cat, is brought into conversation with theoretical discussions of play such as Johan Huizinga's 'Homo Ludens' and recent debates on game design.

The game project aims to contribute to what is recently coined 'multi species ethnography' (Kirksey and Helmreich 2010) and 'etho-ethnology and ethno-ethnology' (Lestel, Brunois, and Gaunet 2006), in which the behaviours of humans and animals are approached (more) symmetrically. The design project actively engages pigs in a mutual learning process informed by a variety of scientific and theoretical debates. Thereby it allows the exploration of what could be called 'multispecies philosophy'; A form of philosophy which wider publics can be enticed to join in, as becomes clear from the variety of anonymous responses on the web to the project.

Chapter 8: can we design a moral subject that plays with pigs?

Speculating on the possible implications of actually playing with pigs in the ways proposed in the previous chapter, chapter 8 brings together literature on the historical influence of particular genres such as the novel and film on moral experience and subjectivity. By furthermore engaging with recent work in the philosophy of mind, the chapter delves into the question of human-animal relations on the farm via a very different route; revisiting in a new way earlier questions on embodiment, technological mediation and ethical relations that figured in the previous chapters. Ultimately, the question here comes down to a series of considerations involved with actively designing a moral subject. The chapter ends with the question of character of the multispecies moral community that may co-evolve with the proposed game intervention, and its ethical import.

Part IV

Part IV is where more general conclusions are (attempted to be) drawn, looking back at the three preceding parts. It starts with a chapter that questions the entire project of writing this thesis, let alone concluding it.

Chapter 9: why writing ethics?

What does all this mean for philosophy and ethics of farming? Before offering a conclusion, this penultimate chapter again takes up the question of the genre of ethics and philosophy. What is the implicit message of writing books on ethics, as a peculiarly disembodied and immaterial practice? Is the conclusion of a study into ethics as material practice necessarily a written philosophical argument? After a discussion of how to conclude a thesis in philosophy that wants to break out of the very genre it emerges from, the chapter asks whether technological design may then not just allow for interesting public debates and philosophical reflection, but itself could be considered as a form of practicing philosophy and ethics?

Chapter 10: how then to conclude?

In the concluding chapter, 10, the way the various chapters of the thesis build upon each other is explained by showing how each informs the design project described in part III. Thus the conclusion traces the steps of the various chapters as culminating in the pig video game design project, being a material form of actively studying ethical and philosophical questions. In reflecting on this outcome of the research project, the advantages and possibilities but also the downsides and pitfalls of in this way embracing the co-evolution of ethics and technology are discussed. Finally, in the epilogue, we will return to the pig farm where the thesis started, which has in the mean time changed beyond recognition.

Case studies and ethics

Even though the research involves various forms of social science work, eventually it should be considered primarily as a form of (pragmatist) philosophy. The reader should value its descriptions primarily in so far as he or she finds these appealing and helpful modes of thinking and acting, rather than consider them as providing a complete and representative description of ethics as it can be found to occur on average Dutch farms. This is one of the reasons this dissertation is not going to offer the final word on the central ethical issues in farming with animals. Not just because to claim it could would have been a bizarre overestimation of my abilities. But this dissertation does not even aspire to do so. Instead it aims to generate enthusiasm to have a renewed look at the multifarious character of everyday moral and political practices. This explains why (apart from bits of this introduction) it is not organized and written in a style of argumentation directed at justification, comprehensive judgment and final evaluation, but instead hopes to evoke a sense of fascination and ambivalence towards the practices encountered.

Not starting from the ambition to provide a definitive overview of all ethical concerns on the farm also explains the (seemingly) marginal thematic interests: cancelled pig towers, remotely possible in vitro produced meat, the currently stalled development of a mobile milking robot, and unfinished video games now stuck in a messy prototype testing phase. Even though these technologies are aimed to deal with pressing problems, they are unlikely to solve these any time soon. If this means the case studies are not selected on the basis of being inherently important, apart perhaps for those interested in the history of agricultural technology, why then did I choose these? Are these cases and the patterns one may find in them generalizable, and thereby saying something about technology development and agricultural practices more general? This is hard to say, and in fact not directly the main claim here. What the description of these cases does hope to do is, in a Kuhnian sense, provide potential 'exemplars' (Flyvbjerg 2006) of how to think about (and proceed with) ethics as co-evolving with technology. Thus these cases are argued to be paradigmatic, making for a particular coherent outlook on a form of ethics and technology, and entailing a particular research program to study and intervene in issues.

One could argue that this co-evolution paradigm, since it refrains from channelling possible moral outrage to serious issues such as the more activist genres do, actually deflects our moral energies towards an idiosyncratic fascination with the phenomenon of techno-moral change. This is especially problematic when the most important ethical decision is where to direct our scarce attention to. Though the cases studied for this thesis may mostly concern rather marginal technologies, these technologies however have all been quite prominent in giving rise to broader debates and considerable reflection via material tinkering, either in public or amongst farmers: on animal welfare, environmental concerns, labour quality, etc. In these discussions, the various more evidently important ethical concerns around farming were brought forward, often in new and surprising ways. Hereby, these cases indirectly offer a route into studying central concerns of ethics on the farm. Taken together, the case studies aim to showcase a particular approach to the understanding of and intervening in ethical and political debates.

From the list of pressing issues in the mosaic outlined earlier, this study has overall become rather focused on the issue of animal use and animal welfare. This can be explained by the empirical work informing the thesis, and the increased prominence over the past years of these animal debates. Besides probably being guided by attention towards animal issues in public media, it was also promoted by the surge

of exciting work in the emerging wide ranging cross-disciplinary 'field' of (human-) animal studies. This is of course not to say that the form of ethics research explored in this thesis is only relevant to animal issues; Ethnographic, phenomenological and hermeneutic approaches, focusing on 'everyday' experiences of moral concerns and emergence of moral subjects, can very well also be done to study issues of global environmental ethics (e.g. Heise 2008) energy use (Marres 2012) and climate change (Yusoff and Gabrys 2011), as it already is reasonably well established in medical ethics (Mol 2009; Coeckelbergh and Mesman 2007) and psychiatry (Widdershoven, Molewijk, and Abma 2009). And in fact other issues, such as the quality and experience of farm work, environmental problems of meat production, issues of landscape aesthetics, etc, will be touched upon in various bits of this dissertation.

The cases involve dairy cows and pigs, not laying hens, broilers, veal calves, or goats. Even though there are much more chickens in the Netherlands, the two sectors central in this thesis are large, with nearly two million cows and 15 million pigs in the country. These animals or their products for a large part are exported, making this study also 'directly' relevant abroad. These two sectors moreover are sufficiently different: The dairy and pig farmers seem to be different in societal status and professional culture. Also the societal appreciation of their product is very different, dairy farming is much less controversial. Many of those who are critical of animal production, such as vegetarians, do appreciate dairy. And in the Netherlands this sector is generally considered to be an authentic part of the landscape: cows belong here, they are considered as being in place, especially when grazing outdoors in summer.

The research for this thesis took place in and has its focus on the Netherlands: a modest sized but highly fertile country with an innovative agricultural sector that has become the second agro&food exporter of the world.¹⁴ Also it is a country where various agricultural technologies and practices have been pioneered: from breeding high yielding dairy cows to the intensive rearing of veal calves, and from precision farming to robotic milking. The Netherlands also still has a considerable number of agricultural research institutions, which help spur-on technological innovation, over the past decade also featuring numerous projects to develop sustainable forms of

¹⁴ Though this often used statistic is skewed as the Netherlands is a logistics hub for various agricultural products (van der Poel 2014).

farming in processes of 'system innovation' (Elzen et al. 2012; Bos and Grin 2008; Bos, Groot Koerkamp, and Groenestein 2003). As in other countries, over the past decades the intensive livestock farming sector has come under public scrutiny, here indicated and further intensified by the election of two members of parliament of the 'Party for the Animals'. Even though parliamentary and wider public debates on several issues have been heated, Dutch political culture has long been characterized by pragmatism, collaboration and to some extent openness to new arrangements and willingness to experiment. Together with a thriving arts and design sector that in recent years has broadened to engage in a variety of ways with food and agriculture, this made for a very interesting, but probably also rather specific setting for this research. The particular context of this research project will have implications for how to understand its findings; especially considering the importance ascribed in this thesis to culture, material conditions and institutional arrangements in interpreting the ethics of farming.

Between livestock and non-human animals: a note on the choice of words

A dividing mark in writings on farming and other forms of animal use is the terminology to indicate the 'non-human animals' involved. Most within the field that is labelled 'critical animal studies' use this to emphasize that we –human readers of texts on animals– are animals too. In this thesis I have chosen to mostly talk about animals rather than non-human animals. Not just for the sake of conciseness and readability, as e.g. Singer (1975), but also since I am interested in engaging with the ways of talking and relating to animals that farmers do. And even though occasionally it will come up, the consistent use of the 'non-human animal' concept can in my experience become somewhat of a mantra that after a while no longer evokes the fact that we humans are just another animal, but actually emphasizes a lack of humanity as the defining negative feature of all those other creatures grouped under this label. Nevertheless, it did feel more and more appropriate to use 'he' or (in dairy farming mostly) 'she' instead of the formally prescribed 'it' to indicate particular animals.

Much of the terminology to discuss farming is likewise laden with particular meanings and implicit positions on ethical issues. 'Livestock' seems to envisage animals as living capital, as a volume of property rather than set of individual agents. This is common terminology in the sector, besides the notion of 'animal husbandry' which has a somewhat old fashioned patriarchal ring to it that may be felt to contrast with contemporary agricultural production systems. In the Netherlands it is moreover still common to say 'farmers' (*veehouders, boeren*) rather

than the North American tendency to speak of 'producers'. In this sense the Dutch farmers' language reflects resistance to be labelled an 'industry', which in the Netherlands (*bioindustrie*) has the negative connotation of indicating large scale 'factory farming'. Even though there are similarities, North American readers thus should be careful not too quickly assume that the mixtures of moral orders described in chapter 2 will be found in the reality of immense 'Concentrated Animal Feeding Operations' (CAFOs) and their leaky open air 'manure lagoons'.

Rather than being consistent in a choice for particular terms that one may hope to be most neutral or representative, the thesis aims to reflect the variety of ways of talking about the productive use of animals. So while starting from the experience of being in the farming sector, after chapter 2 the term livestock is traded in for other ways to indicate animal production, mostly settling for 'animal farming' (if only for the Orwellian associations this may conjure up). Occasionally even 'farming with animals' seemed an attractive phrase to gesture towards a more reciprocal and mutualist ideal of animal use.

Also the language used to talk about ethics indicates particular positions in theoretical debates. Commonly, 'morality' is used as a descriptive term referring to the everyday choices and morals of people, while 'ethics' is then the theoretically informed systematic reflection on these moral behaviours. Even though this difference in meaning figures to some extent in this thesis, upholding a sharp distinction between these would place the theoretically informed reflection on our moral lives in an overly external position. While the claim in this thesis is instead that the way in which we analyse and reflect on morality is itself part of processes of co-evolution as well. And whereas it is common to analyse ethics in terms of 'principles' and 'values', these terms do not figure prominently in this thesis, mainly for being quite absent from practical discussions that make up 'ethics in the field'. This thesis does not aim to produce arguments from what one may proclaim to be philosophical foundations – again as these are little encountered in practice (at least I haven't seen them). And moreover this terminology seems ill equipped to understand moral (or rather ethical!) change. On the other hand, it is not merely 'attitudes' of farmers that are being charted (Shove 2010) or some representation of their 'interests' being spelled out. Nor do I only want to describe structural changes on a level at which human beings and their discourses and activities are not accounted for. No, we are looking for 'ethics'.

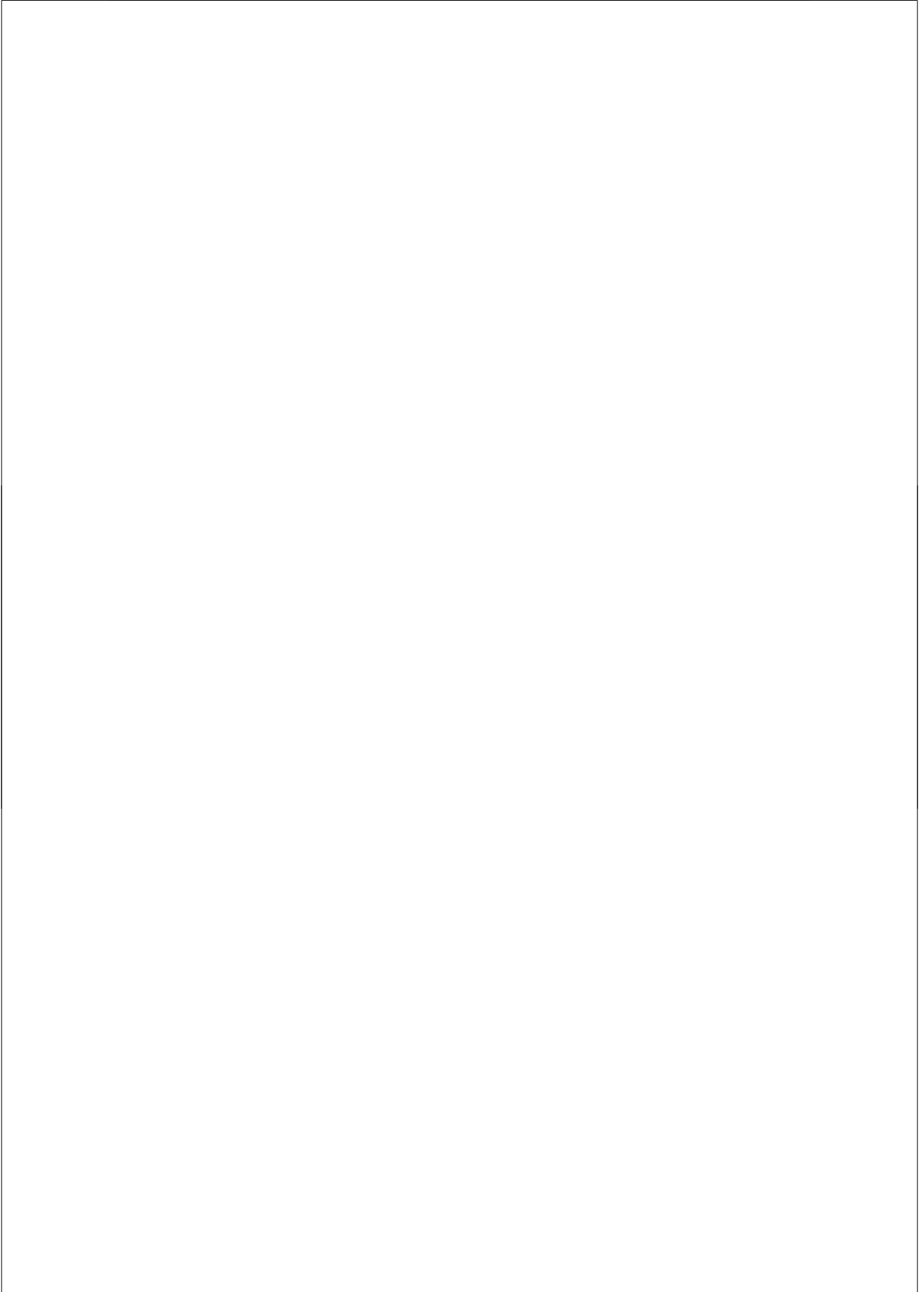
What to look for elsewhere

This is not to say that the kind of empirical research charting attitudes and personally held values, or the more principled and even foundationalist attempts at ethical analysis are fully irrelevant to debates on contemporary farming. Things I did not do the reader can find elsewhere, since the past decade saw an upsurge of writing on ethics in farming, also in the Netherlands. Some interesting examples of work in social sciences and various more traditional types of applied ethics have been published over the past years which help in various ways deepen our understanding and reflection on the ethics of farming. These include works on Dutch farming such as by Cohen, Brom, and Stassen (2009); Frewer et al. (2005); Boogaard et al. (2010); Velde, Aarts, and Woerkum (2002); Bock and Van Huik (2007); Derkzen and Bock (2007); De Greef et al. (2006). But what this thesis hopes to show is that complementary to these –and, all right, sometimes in competition with (some of) these approaches– other forms of engaging with ethical concerns exist that should be taken seriously in debates on the future of food production and animal use.

My main claim with respect to the more conventional efforts in various forms of theoretically inclined ethics is that they should be –and luckily mostly are meant to be– thought of as contributions to what is essentially a public, culturally specific and locally situated debate. Rather than imagining ‘real’ ethical discussions to take place in some ideally rational space of ethics. Which of course then merely is the mundane offices of the professional ethicists and their academic journals, safely hidden away behind solid publisher’s pay walls.

And indeed, this is what I hope to do regarding this other mode of ethics: ‘show, don’t tell’, as the common adage is imprinted on aspiring literary authors, but which can also be considered a good maxim for moral education and learning. Or at least ‘not just tell but also show’. This extensive introduction has so far consisted of theoretical discussions on why going out to farms and speaking to farmers and observing their interactions with their land, their machinery, their animals and their crops is important. And at this stage I probably could have more extensively positioned this approach amidst fellow pragmatist philosophers of farming, such as the grand old man of the field Paul Thompson (1995; 2004; 2008; 2008) and more recently Herwig Grimm (2010), as well as a large number of work in what are in fact adjacent and overlapping fields such as rural sociology and (more-than-human) geography, such as: Buller (2013); Roe, Buller, and Bull (2011); Miele, Murdoch, and Roe (2005). But first, let’s now finally just get out there and see. And try to interpret

on the go what we may experience there, while trying out various ways to make sense of what we find. On our return we can always think what this detour through barns, meadows and feedlots contributed to our views on the ethical conundrums of farming animals.

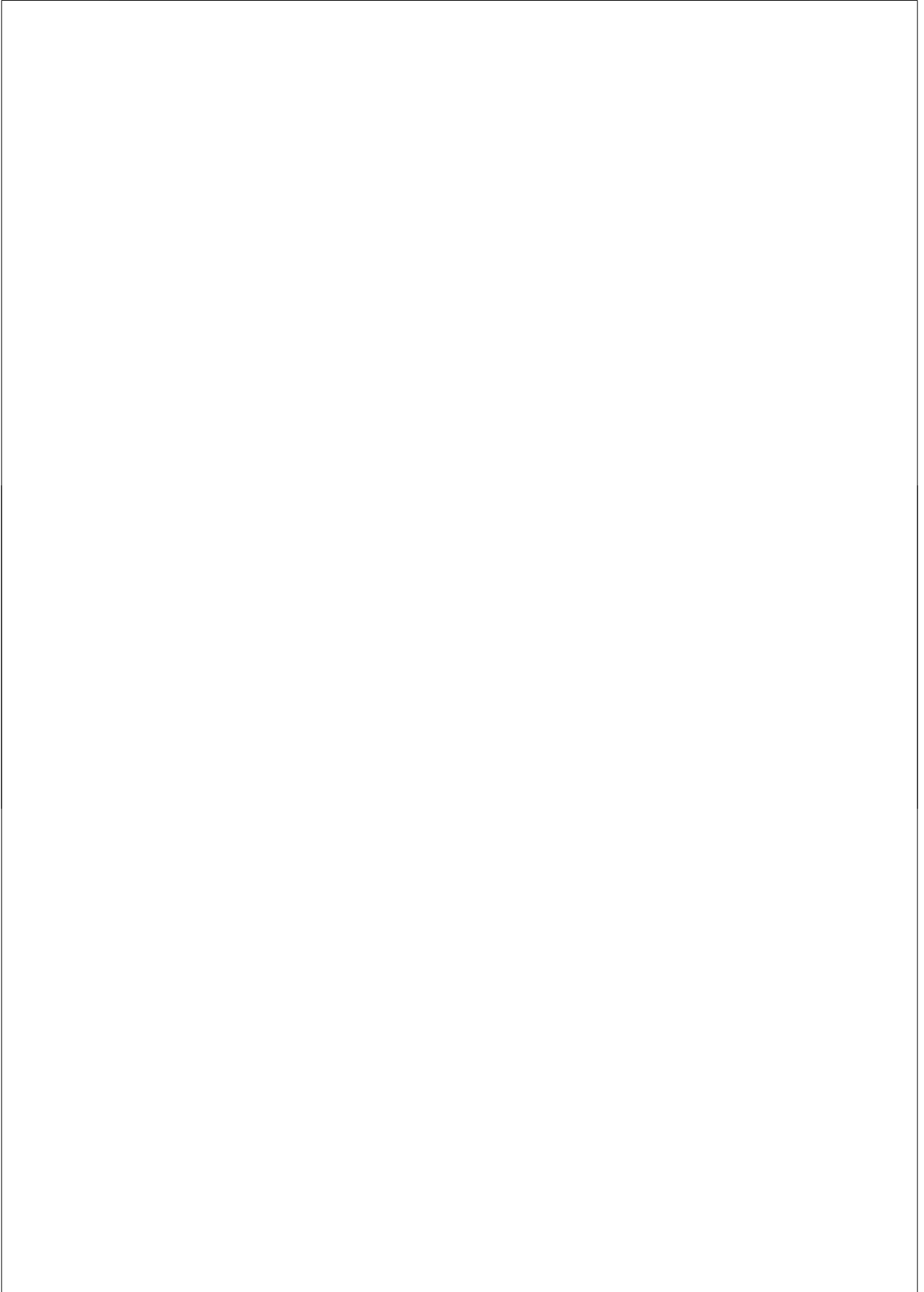


Part I

Ethics on and beyond the farm

This part sets out to study ethics on the farm, starting in chapter 2 with a detailed account of the ways in which farmers integrate the mosaic of concerns in their everyday practices. This chapter is informed by farm based interviews, network meetings of farmers, farm visits together with agricultural students, and immersion in farm life in the form of a short but intensive practical training course.

The next chapter, 3, analyses how the mosaic of concerns has also been approached in a radically different way, by technological research and development projects that aim to make farmers superfluous. Two cases, high-rise pig farms and in vitro meat, are discussed in terms of the public debates they generated. That chapter is based on media reports and public meetings in which the two technological proposals were debated.



Farmers engaged in deliberative practices – an ethnography

2.1 Introduction¹⁵

Talking 'ethics' with farmers?

A casual conversation between for instance two dairy farmers might move logically from the weather forecast, the amount of rain since the 'first cut' of grass, and the health status of the cows, to preparations for the possible implications of climate change; and from interest rates, lending policies of banks, designs for new housing-systems, to milk prices, microbiological cell-counts, and breeding choices. Farmers typically do not discuss ethical issues in the way policy makers or professional ethicists tend to do. For instance 'animal welfare' is not a subject likely to be discussed as such, or that one can easily start a conversation on in these terms. "Let's not lose sight of farmer welfare as well, shall we" is easily retorted. Does this mean that farmers do not care about the welfare of their animals, or only consider it as far as it is part of their productive concerns? Not necessarily, as I will argue in this chapter. But in what way do ethical issues feature in farming practices and the discourse of farmers? How can we best understand the 'ethics on the farm', the moral experience of farmers and their ethical choices? And in what terms could we engage in conversations with farmers on societal concerns situated on their farms?

¹⁵ A slightly abbreviated version of this chapter has been published as: Driessen, Clemens (2012). Farmers Engaged in Deliberative Practices; An Ethnographic Exploration of the Mosaic of Concerns in Livestock Agriculture, *Journal of Agricultural and Environmental Ethics* 25(2): 163-179.

A mosaic of concerns

Livestock farms have become the sites of numerous ethical issues that have gained prominence over the last decades (e.g. Kunkel 1984; Fraser 2001; Beekman 2008). An overview of this mosaic of concerns has been sketched in the previous chapter, section 1.2, but to briefly remind us here:

- the supply of healthy and safe food of quality and taste;
- labour conditions and income of farmers and farm workers;
- rural livelihoods and regional economy;
- the wellbeing of farm animals;
- environmental conditions of water, soil, and air,
- including greenhouse gas emissions and their effect on climate change;
- the health of local inhabitants in the light of emissions and zoonotic diseases;
- effects on nature and biodiversity;
- the depletion and efficient use of resources;
- the aesthetic and cultural value of landscapes;
- concerns of global justice, food security and fair trade;
- and the accessibility or traceability of agricultural production to the public.

One salient feature of this list is the sheer diversity of types of concerns that are involved. Furthermore, for each period in time, for each country or even region, and for each agricultural sub-sector, the formulation and perceived significance of these concerns will be different (cf. Jensen and Sorensen 1999). Whether they feature as societal problems, market externalities, or are taken up as the multiple aims of agricultural practice, deliberations on their meanings are situated in distinct arenas. What is fairly universal though is that increasingly these issues are moved from the sphere of farmer discretion to that of public policy and market choice (cf. Rollin 2003; Meijboom 2009). Many of these concerns, such as animal welfare and environmental degradation, have developed into separate policy fields and accompanying scientific disciplines. Ethical analysis and theorizing regarding these fields has developed as well, offering a variety of 'sources' of values, and arguments on the types and severity of the obligations these entail. At the same time though, these issues can be considered to be in many ways interrelated (e.g. Korthals 2001; McGlone 2001; Appleby 2005; Constance 2009); Which makes more encompassing perspectives on the practical ways of dealing with the mosaic worthwhile to explore.

Farmer ethics

The perspective from 'practice', of farmers themselves, has remained rather mute in public discussions. Apart from occasional fierce outcries and forceful lobbying to further their perceived interests, little debate has emerged on the visions of farmers regarding the public concerns situated on their fields and in their barns. Nor are they easily considered to have a (collective) professional ethics (Meijboom 2009). Sociological studies of (types of) farmers have yielded a diversity of coherent and internally rational farming styles (Van der Ploeg 2003). This typology can be extended and linked with categorizations in terms of value orientations, or fundamental moral attitudes (Cohen et al. 2009). In this chapter this kind of systematic categorization of types of farmers and their ethical stances is not the aim. Even though these labels may be found to explain positions of farmers regarding ethical debates, they also may function as shortcuts to actually having to speak and listen to them. Rather the goal here is to explore the forms that ethical considerations take in farmer decision making, and the ways in which ethical concerns feature in a variety of farmers' practices and discourses. By elaborating concepts to interpret the breadth of moral experiences of contemporary (Dutch) livestock farmers, the aim is to enliven ethical debates on their practices, and to make their considerations amenable for critical public discussion in terms that are meaningful to them. Several characteristics of the way farmers encounter concerns depart from contemporary societal ways of dealing with ethical issues. This makes that the ethics professed by farmers is at odds with the modern moral landscape. By increasing the understanding of contemporary farm life among policy makers and the general public, room could be created for farmers to more actively and sophisticatedly join debates on environmental concerns, nature conservation, animal welfare, and (even) the global impacts of livestock farming. With an appreciation of their publicly debated 'ethical room for manoeuvre' (cf. Korthals 2008) we could move away from the adversarial and entrenched oppositions that often characterize these discussions (Fraser 2001), if they take place at all.

Outline

In the next section, three ways of approaching the mosaic of ethical concerns are distinguished: principlist ethical theories, technological optimization, and a pragmatist and ethnographic approach to ethics. In section three, some theoretical backgrounds to this last approach will be elaborated, and the way situations were sought to study ethnographically the discourse and practices of farmers will be explained. Section four describes the peculiar nature of farming practices vis-à-vis

common modes of ethical theorizing. To systematically chart the mixture of moral motives in the practice of farmers, in section five a sociological model distinguishing justificatory regimes is explained, and used to interpret the fieldwork. After this, in section six, the farmer approach to concrete ethical issues is illustrated by an example from dairy farming: dehorning cows. Finally, some implications of this understanding of farmers' ethics to the analysis of ethical concerns and public deliberation are discussed.

2.2 Three approaches to the mosaic of concerns

There is a variety of ways in which the ethical concerns in livestock farming could be understood and dealt with. Here, three kinds of approaches to farming issues are distinguished.

Principlist ethics

Most classical ethical theories that are applied to discuss animal farming are attempts to reduce issues to a single moral principle, usually either the pleasure and suffering of (human and animal) sentient beings, in utilitarianism, or respect for living subjects, in rights theories. Pluralist approaches to dealing with ethical concerns acknowledge the importance of multiple principles, most commonly: beneficence, non-maleficence, autonomy, and justice. This type of analysis, which originated in medical ethics (Beauchamp and Childress 1994), has been adapted for the analysis of issues in animal husbandry (Mepham 2000). Advantage of this approach is that there is room to systematize the complexity of concerns and formulate 'dilemmas' in dealing with these. The mosaic of concerns can then be taken to be the site of tragic choices, for instance between consumer autonomy and animal well-being, or as trade-offs between farmer safety and the intrinsic values of animals. These conflicting concerns in this pluralist approach can be charted in terms of non-reducible principles. However, these principles by themselves provide no definite way to decide on them.¹⁶ If applying ethical theories in itself then is not enough to 'solve problems', the question arises whether principles derived from

¹⁶ Even though ethical analysis in terms of principles can be instrumental in broadening the understandings of ethical concerns in societal debates. Especially when appending principled ethical theories with participatory approaches, these can provide ways to guide decision making on societal issues (e.g. Kaiser and Forsberg 2001).

theories are the best, and only, searchlight for getting at the complexities of moral choices. Furthermore, a focus on ethical dilemmas could run the danger of turning dynamic innovation and regulatory processes into static situations for moral appraisal; thus reifying existing practices instead of opening up possibilities for creatively developing win-win situations.

Technological optimization

A second approach does not consider the mosaic of concerns to be a terrain for ethical debate, but rather for scientific research and technological innovation (cf. Rollin 2003; Fraser 1999). The mosaic here is taken as a list of variables to be optimized in complex systems. An extreme example of this approach can be found in proposals to create integrated 'agro-production parks' in which, within a closed 'industrial ecology', large scale pig breeding and fattening could be combined with biogas production and fish breeding (e.g. De Wilt et al. 2000). The benefits of the projected huge scale of this type of facility, preferably situated in a sea port, would be utilized to reduce emissions and increase the amount of space per animal. And a slaughterhouse within the facility would preclude the need for transporting live animals. This proposal, though potentially offering a solution for a number of pressing issues of animal welfare and environmental emissions, did overlook concerns that could have come up in the principled ethical approaches; for one thing the parks may mean a stark decline of 'farmer autonomy' (cf. Driessen 2007). This type of schemes (in public media in the Netherlands labelled 'pig towers'), that focus on large scale forms of innovation in dealing with these issues, have shown to give rise to severe public resistance and lack of trust (e.g. Hoes et al. 2008). Meanwhile, taking the mosaic of concerns as mainly a technological challenge for producing win-win situations can be misleading and short sighted, as ethical choices on priorities and ideals would still be part of the process.

Ethics by engagement in practice

The two modes of dealing with the mosaic of concerns sketched so far have in common that the issues are addressed as if they require an understanding from a single vantage point. Whether it is by means of ethical analysis and public deliberation, or scientific research, engineering and design, the ethical decision (-making process) is implicitly thought of as centralized and generic. Even then, the perspective of farmers, who in their daily practices somehow try to integrate (or circumvent) the mosaic of moral demands, can be relevant; for instance by

providing an insight into the practicality and feasibility of the ethical solutions (Birnbacher 1999).

An alternative approach to ethical concerns is one in which the empirical research is not merely part of an effort to solve ethical puzzles that are basically considered to be those of an altruistic and all-knowing collective agent. That alternative would be a conception of ethical thinking that considers the world as populated with a variety of moral actors.¹⁷ This approach is more likely to help motivate farmers to be 'ethical', by granting the opportunity to develop and follow their own rationality. Instead of forcing a choice between solving principled dilemmas or searching for technical win-win solutions, the focus on practice means publicly engaging in a continual combination of deliberative trade-off and experimental learning.¹⁸

Not all ethical concerns are best dealt with by merely granting an ethical 'license' to the farmer to do as he or she pleases. Sometimes strict governmental regulations or market standards are required to help farmers to remain competitive while improving their practices, or to make them reconsider ingrained practices that have come under scrutiny. But farmers can agree on this, and discussing their practices in terms of an ethics that is sensitive to the changing character of systems and norms would contribute to an increased reflexivity on the farm.

2.3 Researching ethics by doing fieldwork

Ethics and Ethnography

Apart from prudential reasons to involve those in the field in ethical debates, listening to farmers as an approach to ethics can be argued for because it is

¹⁷ This does not mean a mere focus on the autonomy side of the pluralist ethical approach. In farmers' decisions and in public deliberations the full spectrum of ethical principles in some form can come to the fore.

¹⁸ There have been numerous research projects to design sustainable farming systems that actively involve farmers (e.g. Bos 2008). And agricultural research, especially within the organic sector, has a tradition of studying issues in collaboration with farmers and to include their viewpoints and experiences (e.g. Waiblinger et al 2000). Also farmers themselves have set-up local initiatives for technological and institutional ways of dealing with a variety of concerns (e.g. Eshuis and Stuiver 2005). But these are mostly not explicitly understood as involving ethical choices and trade-offs. The third approach here is not meant in opposition to these efforts, but to highlight ways of actively dealing with ethical concerns within them. While the general thrust of public debate and policy making with regard to these issues is aimed towards generic regulations and top-down decision making.

important to retain concepts and search for arguments that do not stray too far from actual moral experiences and motivations of people. In order to prevent us from 'losing our concepts' (Diamond 1988), the role of ethics is to explore and develop rich accounts of our moral universe. An understanding of the nature and role of ethical thinking that is considered to benefit from engaging with practices can be found within the tradition of pragmatism. There, both knowledge of the world, and an ethical stance in it, are considered to result from active experience, since people are always embedded in a particular environment (Light and Katz 1996). Ethics therefore is to be found in culture, which is not to be understood as an 'add-on' to material reality, but as constitutive to understanding, in which the symbolic and the material are integrated (Geertz 2000). With personal (or collective) experience and the meaning of context as the focus of ethical inquiry, anthropological fieldwork is an appropriate form of empirical study of ethics. An ethnographic engagement with practices can help to bring some of the 'messy heterogeneity of being in the world' into ethical discussions (Whatmore 2002). Central distinctions in ethical thought, such as between nature and culture, and the social and the material, can then be explored as shifting ground, rather than assumed to be stable and unproblematic norms to assess farming practices. Especially in our technological culture, having an eye for the co-evolution processes of material practices and normative stances is central to developing an ethical understanding of problematic situations (Keulartz et al. 2002). The aim of fieldwork is then to yield a focus of ethical analysis not solely concerned with values that are expressed discursively, but also with material and embodied ways of dealing with ethical concerns that are of a relational and experiential character. And studying what happens in the field would grant a view on the ways in which the moral agency of farmers emerges from material arrangements and the behaviour of animals (cf. Higgins 2006). Then, besides farmers, also animals are not considered as generic moral patients, but through their individual behaviour may play an active part in ethical learning processes.¹⁹

¹⁹ These include not only the farmed animals, but also wild animals living on farms, such as meadowbirds and their predators: Many farms participate in schemes to protect nesting meadow birds of endangered varieties. Volunteers mark the nests of of these birds so farmers can mow around them. However, predators tend to find out about the meanings of the flags in the field, and use these to find their prey. Farmers and volunteers have been searching for new ways of indicating nests in order to prevent this.

How to study ethics in the field

Now it is clear that we need ethnographic accounts of the discourse and practices of farmers, how to go about studying these? Where, for instance, was the author during the conversations sketched in the introduction? Interviewing farmers on their 'ethics' proved to be difficult, especially as farmers tend not to see the advantage for their practice of discussing ethical theories (Driessen 2008). Instead, for this chapter the author has sought and arranged situations in which farmers explained their practices and justified their choices within farming peer groups. This was done by participating in a weeklong practical training course for young dairy farmers, together with a group of agricultural university students; by accompanying animal science researchers on farm visits; by joining in meetings of dairy farming networks aimed at dealing with practical concerns; and by arranging excursions to innovative farmers with mixed groups of vocational and academic students of agriculture.²⁰ The fieldwork was set up as moving from passive, non-directive, studying of farmer discourses and practices, to more active forms of presence and questioning. At these various occasions, the arguments and behaviour of farmers and (farming) students were observed, and preliminary findings and interpretations discussed with them, asking for further explanation and justification of their views and practices, while explaining the purpose of researching 'their ethics'.

2.4 Farming as a matter of mixed motives

In what way do the moral understandings of farmers diverge from ethical theorizing, and what to look for in the 'ethics of farmers'? Where most ethical theories distinguish self-regarding from other-regarding concerns, while

²⁰ All in all, the number of farmers that were visited, or somehow interacted with, was about fifty, in various degrees of individual encounters and depth of talks. About the same number of vocational students (in three weeklong excursions) of different educational levels was spoken to, most of whom had a farming background, worked on a farm, and planned to take over the parental farm. The study is confined to Dutch farmers, mostly dairy and pig farmers, with a few poultry (laying hen or broiler) farmers. The farmers were predominantly male, though many of the farms were of the 'maatschap' (partnership) legal format and included an active role for women; about six of the farmers and about thirteen of the participating students were female. An effort was made to interact with a variety of types of farmers, though an emphasis was on more 'innovative' ones who experiment with new practices and techniques; Organic (and perhaps somewhat 'eccentric') farmers are likely to have been overrepresented. This chapter, nor the rest of the thesis, not so much aims to be 'representative' of farmers in general, but rather to propose ways of discussing farm practices that connect to the experiences and outlooks of farmers who are explicitly reflective and willing to engage in forms of public deliberation.

demarcating ethics as concerned exclusively with the latter, this seems a particularly ill-equipped mode of thinking about farming. Though in some instances pointing at purely self-regarding motives has critical force (e.g. when animal welfare is defined purely in terms of productivity), a more ambiguous type of ethical thinking is required to connect to the intricate nature of farmers' motivations, and contributes to the search for improvements of elements of the mosaic that are not directly offset by losses in income.

The activities of most farmers are not completely guided by concerns of efficiency and profit, not even those in highly intensive sectors such as laying hen and pig farming. In farm visits, these 'mixed motives' can be encountered at many points, for instance in the relations to animals. The morality of their motives is most salient at moments when farmers diverge from what is economically required. Then there are clear instances of moral concerns, such as when cows are given expensive treatments even if production standards would require them to be culled, or a sow is kept one more round even though she is expected to have become not productive enough anymore. Here *the ethical* appears as the irrationalities that stand out from a perspective of pure economic rationality. And farmers talk of feelings of sadness when animals die: "You sometimes do get a bond with a certain cow, and experience a sense of loss, even mourning, when she dies. I even know of a farming family that has a picture of their favourite cow framed in their living room. But that goes a bit far I'd say." Or farmers may exhibit forms of coping behaviour, as related by a sow farmer: "Sometimes a sow dies a few days before she is due to deliver. It is not economically sensible to perform a caesarean on a sow, most vets have never even performed one. But next time a sow dies I'll go and take a walk, rather than stay and watch the unborn piglets suffocating in their dying mother." Clearly, the emotional attachment is more prevalent with animals that live longer and are kept in smaller numbers – more with dairy cows than fattening pigs or broilers and hens. But still, in most farmers some of this sensitivity seems to exist. Often this is explained in terms of reciprocity, of justice towards animals that have produced a lot, or of a personal relation with an animal that behaved good natured towards the farmer. But occasionally also just in terms of 'fun': "Sometimes, in the new laying hen housing, I just go and sit on the floor, and they will come and climb and sit on top of me."

When looking for ethics in farming the focus thus easily goes to irrational moments at which farmers do something against their productive interests. These

irrationalities and inefficiencies can be a way for farmers to gain some sympathy, or even legitimacy, in the eye of the general public, as caring not just for money, but also for animals, nature and the environment. But situating the ethics solely in these exceptions to the productionist rationality implies a portrayal of animal farming as basically unethical. To grant farmers a serious ethical stance requires an appreciation of their central aim: the efficient production of food (Thompson 1995). Then, what in the eyes of outsiders appears as a *double attitude* towards nature and animals, for farmers is a coherent practice. Even in their bodily way of approaching animals, this hybrid relation can be seen at work. Cows are stroked at the same time in a caressing and measuring way. The touch estimating stomach movement or bone structure can morph into a pat on her back. In this way the ethics of farmers is performed in their bodily locomotion and interaction with their animals. The ease of handling a chicken, of picking it up and tucking it gently under one's arm, can be accompanied by another swift movement of holding it by its feet, and proudly, if somewhat reluctantly, indicating the way one could pull the head off in a single movement. This ambivalent way of relating to animals might come across as inconsistent, or even disturbed, especially to someone unfamiliar with the realities of farm life. This hybridity (or perhaps 'monstrousness') of moral relations to animals is most clear in case of traditional farming practices. Before modernization took hold, the moral universe of the farmer was –even though comprised of a complicated set of relations– experienced as self-evidently coherent (Harbers 2002). But also contemporary farmers mostly do not experience tensions between say high-tech machinery and ideals of naturalness, such as regarding milking robots.

2.5 Regimes of justification as a model to draw out the moral complexity of farming practices

Orders of worth

In order to appreciate the variety of types of concerns and gain a systematic understanding of the hybrid perspective of farmer ethics, the mixed motives of farmers can be portrayed in terms of the 'orders of worth' in the framework of practices of justification as developed by Boltanski and Thevenot (1991). They offer a model to study the kinds of justifications people produce for their actions, drawing

on both fieldwork (mostly on labour relations in large French organizations) and classic works of political philosophy.²¹ They distinguish six types of common justificatory grammars or regimes: The worth of *inspiration*, in which value is derived from creativity, holiness, emotion and imagination. This is how the production of art is understood, personal experience is lived through, and visions are developed in spite of the opinions of others. In the *domestic* order a normative grammar is common in which personal relations of trust, kinship, face to face encounters, self sacrifice and tradition are valued, and where a sense of place is important. The regime of *renown* is all about honour, recognition, the opinion of others, and public display of success. The *civic* order comprises a type of arguments that relate to (some understanding of) a common good, such as in terms of equal rights, or solidarity. The *market* regime is coordinated by contracts between consumers and producers, and is focused on mediating scarce goods. Appreciated are entrepreneurs that seize the opportunities offered by the market. In the *industrial* world, worth is based on efficiency in the production of material goods. Professional capabilities of experts are valued, their organizational planning and investing to increase productivity.

All these domains can be a resource for actors to make (generalizing) claims, to debate public issues, and to evaluate situations, persons or objects, by interpreting their relevant aspects.²² Disputes in practice can arise over the legitimate criteria to judge an action or a situation, as humans have the capacity to criticize the type of arguments produced by others in a specific situation.²³

²¹ With this model for empirical research, convention theory offers a way to take seriously the agency and justifications of actors, while also allowing for the existence of (performed) forms of universality. Thereby creating a middle ground of conceiving agency, between technological or structural determinism and ideal autonomous ethical agents.

²² As an example of how arguments on an issue can be drawn from these various orders, one could focus on our ethical concerns over animals: Farmers could be convinced to improve the treatment of their animals in order to raise their productivity and lower costs (industrial), or they could be motivated to do so as a business opportunity, by gaining a higher price for welfare labelled products (market). We may be inclined to want to treat animals humanely based on experiences of caring for our pets and having personal relations with animals (domestic), or due to celebrities that campaign for the ethical treatment of animals (renown). We may as well be convinced by activist groups arguing for the institutionalization of animal rights (civic), or we may have had a life changing experience after encountering in the wild a whale, dolphin, elephant or another 'honorary primate', or hold a religious conviction that requires reverence or duties towards animals (inspired).

²³ Not always do people engage in justificatory explanations for what they do; some societal processes are contingent, sometimes people make private arrangements outside of these orders, or various forms of power are exercised without justification.

These six modes of evaluation are not to be understood as the full range of possible justificatory logics. For instance a 'green' order of worth was later added, describing the type of arguments found in discussions over environmental concerns. And cultural differences may exist in the meanings of orders and their relative importance (Boltanski and Thevenot 1999; Lamont and Thevenot 2000).²⁴

A number of authors have applied the orders of worth to study struggles and debates within agriculture (e.g. Marsden et al 1996; Busch, 2000). The framework can be used to describe differences and strengthen oppositions: between organic and commercial; between high tech and traditional; between bulk production and quality; and between commercial and idealist organic farmers. Rosin and Campbell (2009, 40) point at the complex ways in which contradictory justifications are negotiated and combined in the development of organic agriculture. In this chapter, the orders are used not to differentiate farmers, but to explore the intricate ways that various norms operate in farming practices.

Farming in multiple orders of worth

Of course productivity is one of the central values of farming, often valued for itself (industrial), or in connection with producing abundant and affordable food for humanity (civic). Farm animals such as cows and pigs are valued for being efficient, and practical farm choices are mostly described as 'management' by farmers and others in the sector. Thereby farm practices are positioned squarely in the industrial order. Sustainability can also be understood partly within this order, as the resource efficient production of food.

The market order is also central to the understanding of farming, while getting an adequate price for the produce is a prerequisite to continue farming. Nevertheless, markets for agricultural products are notorious for not being 'true markets', for being highly regulated, organized, monopolized, and subsidized. "Money is a

²⁴ The orders can be understood in a variety of ways. When taken as a model for studying controversies, the orders form a 'moral geography' in which the types of arguments can be charted that play a role in practices and conflict resolution. Alternatively, it can be used as a framework for developing critical arguments internal or external to an order. When the types of justifications are taken to be incommensurable normative paradigms, the model can even function as an approach to resolve issues, through determining the appropriate order for each situation. Used in that way it would resemble the theory of spheres of justice of Michael Walzer (1984). There the different domains correspond with institutions, such as political, market, love and religious institutions, which are each organized according a single societal principle (cf. Lamont and Thevenot 2000, 6).

necessary evil; if you want to become rich you should not become a farmer; all the money we make we use to invest, or to pay off bank loans." Farmers nevertheless may operate as entrepreneurs, also in seeing the market value of other elements of the mosaic, such as 'green services' for nature conservation that are paid for by the government.

Farming practices are also situated in the domestic realm. It is common among e.g. dairy farmers to ask "how many cows do you have at home?" when discussing someone's farm, as they predominantly still live next to their production facilities. And in the architecture, also of comparatively large stalls, an effort is made to create an ensemble that conveys a rural image and connects to regional architectural traditions. In a discussion the author had with farming students, these contested the use of the (in their experience derogatory) term 'industry', even for comparatively large scale farming operations: "What does it matter whether a farmer has a hundred or 300 cows, it is still a farm." "But what if the farmer no longer lives next to the production facility?" "Well..., yeah, maybe then it would be industrial." When introducing themselves and their 'business' ['bedrijf'], they typically start with an account of the family situation. Also the importance of reproduction of animals, and production of food, allows their practice to be situated not only in the industrial but also the domestic order. This becomes most clear when the aim of many farmers is revealed: to continue farming and handing down a viable farm to the next generation.

Interesting mixtures of justificatory worlds come together in practice. When farmers mow their fields many will try to avoid hitting birds nests. Not only for the premium they might get (market), but according to several farmers also motivated by a concern for rare species (civic), and to avoid the cruel experience of crushing animals (perhaps inspired or domestic). Farmers notice the need for a multiplicity of orders to increase legitimacy (public or private) of their practice. A pig farmer explained: "With our new sow-stall with group housing, the children are willing to enter the barn again, which they refused when we had the confined system." This made the productive area of the farm part of the household again, and also created the potential of one of the children to be willing to take over the farm in due time. Apart from these elements from the domestic realm, the view of (young) children is taken as of special value within the inspirational regime (Boltanski and Thevenot 1999, 370), creating a renewed sense of legitimacy of the farming practice in that respect.

Pig farmers are often keen to explain the variety of origins of the feedstuff they manage to gather, while this type of legitimation of pig farming as efficient and sustainable has become problematic due to the issue of hygiene and food borne diseases (cf. Law and Mol 2008). “Feeding wet mash feed is a challenge, in terms of economic margins and for optimizing the feed, keeping the pigs healthy, and maintaining the taste and quality of the feed. We often use side-products from the human food sector; it is not waste disposal, but it serves to solve a problem; Last year, we received 2500 tons of bread from the Ruhr area, in batches of 50 tons fresh from the previous day. My wife and I, standing in the kitchen, at times found this mountain of bread in the courtyard a troublesome sight. While elsewhere in the world people are starving, here we throw away bread that is still good to eat.” It might very well have been the domestic nature of the shared view from the kitchen that brings this moral perspective home to the farmer (civic, through domestic). The processing of waste-flows in a more industrial setting is likely to be considered far more ‘normal’, when compared to the bread that is clearly out of place in their backyard. At the same time the farmer is proud of, or at least content with, how he manages to keep feed costs low, offer a varied diet to his pigs, and works to recycle waste flows from the food industry and thereby adds value (industrial and market).

One could ask why we should bother that farmers also can somewhat love their animals and care for their land; how it matters that farmers have ethical sensitivities beyond their immediate tasks. But the practical nature of farm activities makes their ethical views relevant to changes in practices. Especially the more entrepreneurial farmers can exhibit a form of ethical agency by creating new ways of dealing with societal concerns. One example would be the investment in alternative modes of energy production by erecting windmills or biomass installations. These initiatives are ways of expressing ethical commitments that can be situated both in market (entrepreneurial), civic (common good), and industrial (efficiency) orders. Of course these initiatives are often taken as part of wider subsidy schemes and market arrangements. But rather than situating all important ethical developments on the policy level, some of the moral agency could very well be located at farm level initiatives (cf. Roep et al. 2003).

A number of both organic and non-organic (whether conventional, or self-proclaimed ‘in between’ or even ‘beyond organic’) farmers stated that organic is “also merely another set of rules.” By thus creating an external position to the organic standards, they created ‘room’ for professional autonomy, a knowledgeable position from which to develop a farming practice that is rational in their eyes

without slavishly following (external) rules that in some situations can be viewed as irrational and overly, or too little, stringent. Thus these farmers create a way of affirming their more 'rational' (industrial) outlook but also a more lived-through farming ethic they developed by themselves, connecting to the inspired order of authenticity and creativity.

The moral landscape of farming vs compartmentalized ethics

Farmers experience their mixed motives and the variety of moral orders mostly not as a hybrid; their practices appear as such only within and when compared to functionally specialized and morally differentiated institutions. When in the theory of Boltanski and Thevenot the orders of justification are considered basically incompatible, farming appears as an ethical chaos. The central issue for understanding the moral landscape of farming is then whether the orders can be legitimately 'mixed' in a single practice, rather than merely cohabit in uneasy compromise.

In our modernized and functionally differentiated society, these orders tend to become separated and roles and relations specialized and purified.²⁵ As localized activities, these moral orders are even spatially planned, thereby institutionalizing and effectively constructing a zoning of types of appropriate normative arguments and possible relations between humans and between humans and animals.²⁶ Areas are designated for (industrial) production, for (inspiring) nature and recreation, or for (domestic) habitation. This type of ethical thinking that resists ambiguity is exemplified by the design of the pig tower and responses to it: as a reaction to the proposal unwittingly a coalition emerged of those that felt that "pigs should be on a

²⁵ Of course there are a variety of other institutions where a mixture of orders of worth are necessary to understand their meaning and practices; think only of the (ideal of the) university, which comprises industrial (producing knowledge workers), market (adding value, spin offs of research), inspired (creativity, self actualization), domestic (campus, modelling teacher student relations on patriarchal, or matriarchal, ideals), and civic (producing autonomous and responsible citizens, doing research for the betterment of mankind) orders of worth. But here as well it can be argued that industrial (output measurements) and market norms (increasing numbers of students and tuition fees, and meeting the market demands for workers) are increasingly dominant.

²⁶ Regarding the orders of worth and our dealing with animals it is clear that our motives and justifications for certain treatments of animals are varied, but also that in modern society there is a tendency to separate these understandings of animals over different human animal relations and societal domains. Animal practices and the attending relations and meanings can then legitimately only be of one kind, and farming is no longer one of these 'singular' practices (cf. Korthals 2004; Harbers 2004).

farm” and others that claimed “pigs don’t belong in a factory”. Concrete plans for large scale pig farms more recently though met fierce resistance from local inhabitants, stating “this belongs in an industrial zone”. With the industrialization of agriculture, the ethical issue comes down to sorting out where an activity belongs in our discretely zoned moral landscape.

When assessed from each single moral order, current practices seem deficient and suboptimal. Most farmers are not fully entrepreneurs, nor are they the best imaginable nature managers. Much of contemporary farming in the Netherlands still is a peculiar amalgam of modernity and tradition, of material production at home, of high-tech efficiency and relations of care (cf. Meijboom 2009). With farming understood and arranged as a *focal practice* in which these various aspects are combined, productive work can be an adequate *response to place* (Thompson 2000), rather than a *NIMBY* activity in search of a wasteland. For this an intricate combination of modes of critique would be required to appreciate dealing with farming concerns.

2.6 An example of ethical decision making as practical engagement: cow horns

Should cows have horns, or is it permissible to dehorn them? That is the type of question an agricultural ethicist might try to answer, and that would be prone to become subject of governmental regulation.²⁷ What would the ethical approach of farmers themselves amount to?

Horns and dehorning in the field

On a farm visit with agricultural students, a farmer explained:

“Cows with horns offer little trouble, as long as the housing is in order. With our large round and open housing, the weakest animal in the herd can flee; in loose (box) housing you sometimes see that an animal can be totally *butted to pieces* [helemaal kapotgestoten]. Then you’ll see blood in the milk from the fighting; this we see only a few times a year.”

²⁷ And it is a good example of a complex, multi-factorial issue that is best studied by involving the views and experiences of farmers, as there have been some efforts in the past (Waiblinger et al. 2000; Baars and Buitink 1995).

There is some *grumbling* talk among the attending farming students.

“Why do you want to have horns?” “We do not believe horns are ‘antennas to the cosmos’ or anything like that. But we do believe that horns play a role in their digestion system, that it improves their health. [...] We are in the process of converting to a herd that retains the horns. The young cows became aware of their advantage and took charge of the herd. For milking we now put all cows with horns in the waiting area, and close the gate, so the cows without horns can eat at the feeding fence, because these started to give substantially less milk, being constantly pushed away from the feed. This works very well. [...] And one of the older cows has managed to regain power, now we have some more peace in the herd again. [...] Yes guys, take a good look, we find it beautiful. We have gotten used to seeing horns on their head, without them now looks very strange.”

When the tour moves into the field, the cows come walking towards the large group of visitors and mingle with them.

“You see these cows are clearly not afraid, but curious. When they see people they come and take a look.”

The students start goofing around with the cows, trying to catch their horns, and prolonged playful interaction ensues during the talk between students and cows. But most consider for their own farms retaining the horns to be too dangerous, to the farmer and to the other cows. Another dairy farmer has both a loose housing and a small tie-stall. He uses the latter for young cows that pose problems:

“This tie stall is for when the cows act difficult [een beetje moeilijk doen]. When heifers are in here for a winter they are tame for the rest of their lives. Anyway, I think this stall is more *cozy* (*gezellig*), more intimate, more homely (*huiselijker*). This is where I go to in the evening, when the work is done, and with a small light sit with the cows.” [...] “As long as the cow does not use them as weapons, she may keep her horns. But at one moment they may find out: ‘Hey, I am strong!’”

Arguments concerning horns and dehorning

The issue of dehorning could be considered to be purely a technological challenge: of a method for painlessly dehorning, of designing housing that is suitable for horned animals, or of breeding cows without horns. Alternatively, one could argue dehorning to be a case to be decided in the ethical terms of 'bodily integrity' of the cow, dismissing this mutilation of the animal based on her (civic) right, or perhaps (inspirational) essence. But when taken up solely from these angles, several aspects would not be discussed. Whether the housing is adequate to prevent horned cows hurting each other depends also on the skills of the farmer, as with the farmers that organized the milking process differently, or 'tamed' cows in a tie stall. And to some extent, as became clear from the dismissive response of the farming students on 'blood in the milk', the issue is also a matter of accepting some level of mutual damaging of cows (cf. Bioveem 2008; Baars and Buitink 1995), whether in terms of loss of productivity (industrial) or as a relation of responsibility and care of the farmer for individual cows (domestic). On top of that, decisions on dehorning were found to include numerous choices: for a type of behaviour and character of the cows and a certain kind of herd, a type of human-animal relation, an estimation of the risk to the farmer, an aesthetic appreciation. These interconnected choices farming abounds with are not easily decided outside of the particular situations in which farmers find themselves, and the multiple orders from which to evaluate their practice, as they ultimately come down to the question of what kind of farmer to be. A discussion of the issue of dehorning without taking these concerns into account would not be deemed relevant, let alone convincing, to most farmers.

Within the industrial order, farmers have different ideas on the benefits of horns for production or on the damage they do to each other. In the order of renown they may want to accord to the image of cows with (certain types of) consumers, or hesitate to be known among conventional dairy farmers as the atypical one with horns. They may be motivated to keep the horns to comply with the regulations of a type of organic (biodynamic) brand; out of marketing concerns, or inspired by the philosophy behind the brand. Also the playfulness that emerged between students and cows is a type of value within the inspired order, in a very different vein than the 'antennas to the cosmos' that were alluded to. And the choice between different human-animal relations could be framed as one between domestic type of patriarchal dominion and inspired respect for independent animal characters.

An issue such as dehorning thus is experienced within various orders of worth, without being clear which types of arguments are to be considered legitimate. It is

possible to debate and practically experiment with the appropriateness of certain orders concerning the issue. The orders help to search for and reveal the complexity of concerns and make it likely that not a single universal prescription would be best. Even for individual farmers the issue would not be resolved as a singular 'decision' based on discursive arguments. Rather, the issue is the subject of an ongoing learning process in which considerations from multiple orders play a role, or are actively dismissed, and in which embodied forms of experience, skills, self identity and relations are part of the dynamic.²⁸ Furthermore, the issue of dehorning was seen to contain several concerns from the mosaic: besides the animal welfare aspect it is also a matter of farm worker safety, the cost of housing, and even landscape aesthetic.

2.7 Implications of the sketch of farmer ethics for deliberations on sustainability

Public debate infused by farmer experiences

What do the ways in which farmers experience and express the ethical aspects of their practice mean for debates on sustainable agriculture? The descriptions of farmer motives in terms of orders of worth revealed implicit positions on the types of moral arguments that can or should be part of public deliberation. When farmers and their views are not obviously included in these debates, or if the ability of farmers to take part in ethical debates is questioned, a choice is already made on whose terms these debates are to be performed and on what constitutes legitimate arguments and a meaningful debate. Recognition of the peculiarly entangled nature of the ethics of farming practices could counter the tendency in policy making, technological innovation, and ethical thought to compartmentalize our moral landscape. Understanding farming practice as the integration of the mosaic of concerns in the light of a wide variety of moral experiences would foster public appreciation of the mixed motives of farmers. Rather than try and fit them into the mould of ethical theory that purifies self-regarding from other-regarding motives and situates all meaningful ethical concerns in the latter.

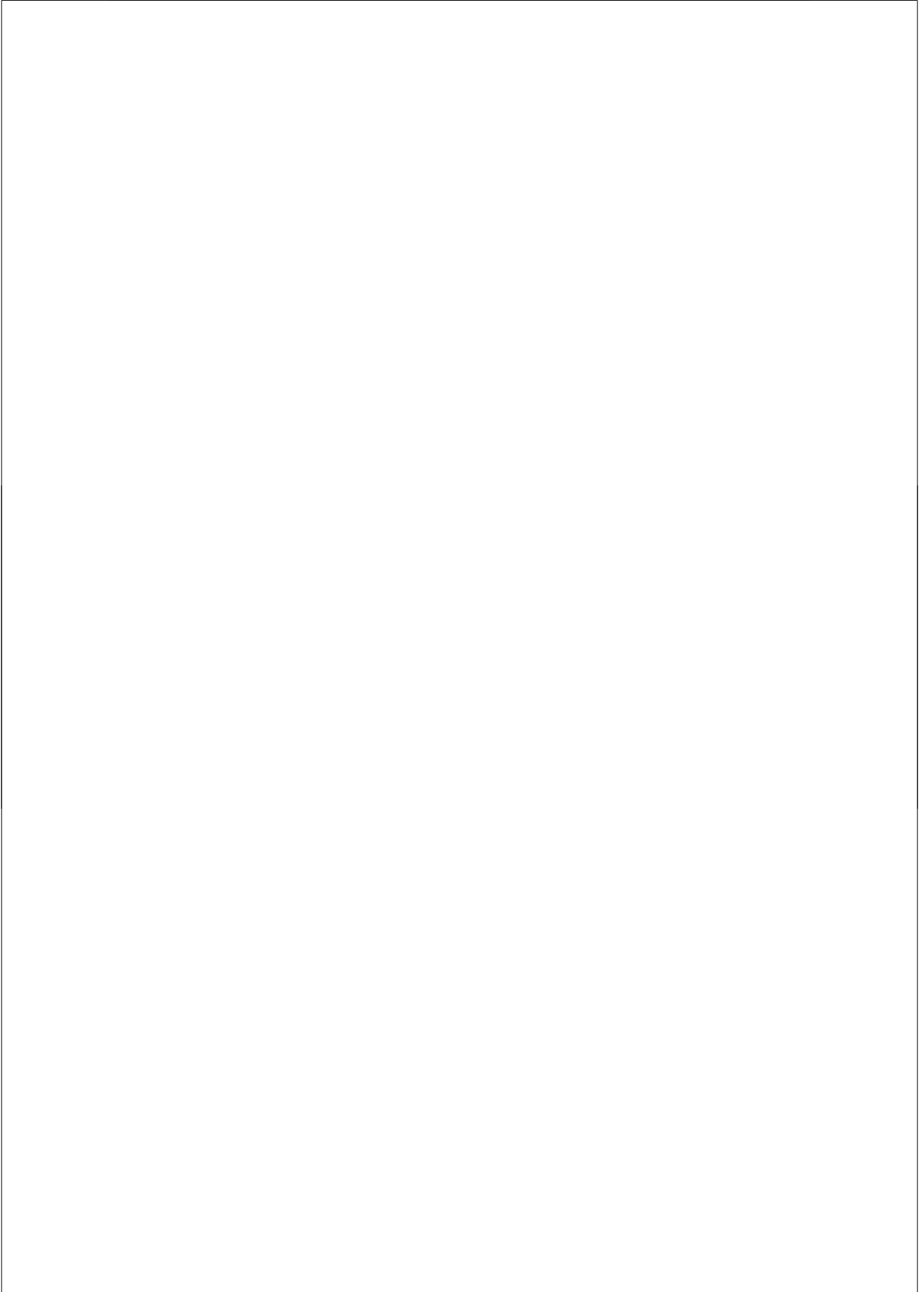
²⁸ The issue can be found to contain different views on the character and behaviour of cows: as in principle benevolent (inspired), or as in need of guidance and control (domestic).

With the 'selves' of the farmers and their families considered as part of the meaningful context of local practices, ethical debates would include a variety of experiences and considerations and include embodied ways of interacting with animals, food, agricultural nature and the environment. Then it is clear that the mosaic of concerns requires ethical responses from a range of orders of worth, and that the mixed motives of farmers offer a relevant outlook on this mosaic.

Ethics as reflexivity in practice

The envisioned outcome of deliberations does not need to be a single generic conclusion, a collective decision on what is *the* right way to practice sustainable agriculture. The variety in circumstances and skills of farmers can be taken as legitimating a diversity of ways to integrate the mosaic of ethical concerns they grapple with (cf. Kupper and De Cock Buning 2010). The case of dealing with horns reveals that for instance defining animal welfare is not necessarily best completely relegated to a centralized policy making process, based solely on scientific expertise and abstract reductionist ethical analysis. Farmers in practice can use the variety of motives and concerns to creatively and reflexively learn to develop a system in which issues are dealt with. This could be considered an argument in favour of institutional and regulatory reform so as to create more 'ethical room for manoeuvre' (Korthals 2008), creating incentives for farmers to pursue and discuss their own strategies. Farmers are mostly able to explain their particular choices and arrangements, and by engaging in public discussions find occasion to further reflect on these. The task of the public would then be to critically follow their endeavours; with professional ethicists interpreting and developing the concepts to reflect on the collective experimental learning processes. This might mean that things will not always be optimized and rationally weighed in terms of stakeholders and values by policy makers and ethics committees. But allowing a space for farmers as moral subjects, acting from their own rationalities and skills in interaction with their products, their land and their animals, will make conversations with them more interesting. Farmers meanwhile will need to show to the public why it should want to prevent their disappearance as (independent) moral subjects, gain a critical perspective on existing practices and technologies, and open up their local and contextual learning processes for public deliberation.





Pig towers and in vitro meat: disclosing moral worlds by design

'I shall now therefore humbly propose my own thoughts, which I hope will not be liable to the least objection. [...] [A] young healthy child well nursed is at a year old a most delicious, nourishing, and wholesome food, whether stewed, roasted, baked, or boiled; and I make no doubt that it will equally serve in a fricassee or a ragout.'

— Jonathan Swift, *A Modest Proposal for Preventing the Children of Poor People From Being a Burthen to Their Parents or Country, and for Making Them Beneficial to the Publick*, 1729

3.1 Introduction²⁹

Animal farming in the industrialized world is increasingly considered to be problematic. People are concerned about its various environmental (side) effects, as well as about animal suffering and the global (in-)justice of land use for animal feed production rather than hunger alleviation. This paper describes the emergence of two radical technological designs that have been proposed in the past decade to address these concerns: pig towers (*varkensflats* in Dutch), large scale high-rise farming systems designed to raise up to a million pigs as part of an integrated 'industrial ecology'. And *in vitro meat*: several research projects that seek to produce meat using muscle stem cells without the need for live animals. Rather than 'assessing' these proposals for their potential pros and cons, this paper examines the dynamic normative processes these technological designs generated when they were made public. I analyze what I call the moral world-disclosing character of

²⁹ This chapter has been published as: Driessen, Clemens, Michiel Korthals. (2012) Pig towers and In-vitro meat: disclosing moral worlds by design. *Social Studies of Science*, 42(6):799-822.

research and design projects, in order to contribute to ongoing debates on the nature of politics and ethics in a technological culture (Keulartz et al. 2002).

Technology beyond the dichotomy of threat or solution

Many early 20th century philosophers of technology warned of technological intrusion into the 'life-world', turning human life into a bleak and meaningless existence (Habermas 1969; Winner 1988). In an era that saw the advent of nuclear weapons and increased bureaucratic rationalization, it was argued that technology and the associated scientific methods of measurement, calculation and optimization would steadily encompass the everyday world and humankind's understanding of itself. It was commonly held that technology left little or no room for imagining or realizing other, more meaningful forms of life, subsuming everyday practices under the technological imperative of ever increasing efficiency, with politics becoming more and more rationalized into a bureaucratic technocracy (Feenberg 1999).

Today, our technological future is mostly deemed to be far less gloomy. Technologies, ranging from smart-phones to hybrid cars, are generally looked upon as convenient and 'domesticated' ways to improve our lives. Most new technologies are viewed as desirable consumer goods or are considered solutions to pressing problems. Global concerns over resource depletion, environmental degradation, and climate change are expected, or at least hoped, to be dealt with, not only by radical political and behavioural change but also by technological means. At most, these may arrive too late, or bring unexpected side effects, which in turn would call for more adequate technological solutions. Whenever new technologies are considered as potential (moral) hazards, such as GMOs or nanotechnologies, these new devices or techniques are scrutinized in detail for their possible impacts and associated risks. More and more, this type of scrutinizing is itself turned into a technical discipline. Ethics committees, or sometimes elaborate lay panels, are meant to direct the course of research and development, aiming to preclude the eruption of heated societal controversy.

The analysis of potential risks and side effects is considered all the more important, as technological advances can be found to displace democratic politics (Winner 1988; Nahuis and Van Lente 2008). Technological change in many ways is political, but lacks in transparency (Jasanoff 2003). Something that is deeply problematic while, as Winner has argued, artefacts do have politics. Artefacts bring a certain social and political organization; they contain implicit choices on who stands to lose and who to gain from new socio-technical orders; and they assume and promote

specific conceptions of the good life (Swierstra and Waelbers 2010). However, these normative and political effects of technologies tend to be implicitly conceived as external threats to an otherwise morally neutral or unproblematic world. They are considered as reasons to bring the development of technology under political control and to bring these sites of displaced politics under the roof of the parliament, or to search for new institutional forms of direct democracy (Dryzek 2000; Korthals 2008), to analyze the ways in which designers should take the normative implications into account (Verbeek 2006), or to draw attention to and call for new *sub-political* forms of democratization, in which technological advances are carefully scrutinized for their potential implications (Beck, 1992).

In this chapter, I aim to complement analyses that focus on the dangerous (side) effects of technologies, by describing in detail the wider ethical and political processes connected with technological projects. I shall consider novel technological developments to be prime occasions for public deliberation (Latour 2005), rather than only as threats to democratic politics. Accordingly, I will explore in detail the processes through which technology and ethical thought and practice can be found to co-evolve (Keulartz et al. 2002). I also will discuss the ways in which technology development may give rise to new understandings of what it means to be a political subject (De Vries 2007). In our view, new technological designs *disclose moral worlds*. They may even provoke novel normative interpretations that extend well beyond the immediate areas in which the technologies are to be deployed. Technologies are surely not to be considered morally neutral, but neither is the societal status quo morally neutral. The default position of technologies as intruding into our everyday world, brought forward in the tradition of the philosophy of technology, seems to have prevented a broad exploration of this process.³⁰ In this chapter, I examine the processes by which new technologies are the (prime) site of political contestation and ethical (re-) interpretation, and I propose to channel some of the ethical distrust and political involvement generated by new technological designs away from these intrusive new elements, to focus on a critical engagement with the existing practices of the world in which they are proposed to be situated.

³⁰ The 'precautionary principle' is mainly invoked to argue against accepting new technologies, rather than against putting up with the risks of continuing with the status quo (Van den Belt 2003; Latour 2011).

3.2 Redesigning animal farming: pig towers and in vitro meat

In this section I describe two technological projects that have not (or 'not yet') materialized as fully operational 'black boxed' devices or products. Over the past decade these techno-scientific projects in various guises and forms have nevertheless gathered a considerable amount of public interest. First I will discuss their initial emergence and associated public responses, after which I will trace in detail how they function as moral world-disclosing designs.

Pig towers

The most widespread and consistent development in agricultural production seems to be its increasing scale. For some decades (for example in the Netherlands) the number of pig farms has halved, while the number of pigs per farm has doubled.³¹ The productionist logic in intensive agriculture of lowering marginal costs while increasing labour output and efficiency has been pointing for some time now in the direction of ever-larger farms. At the same time, modern intensive farming has encountered several limits: the use of scarce space, animal welfare concerns, the unsustainable production of crops for feed, environmental emissions and nuisance to local residents, especially in a densely populated country such as the Netherlands. At the end of the 1990s some Dutch researchers took this development to its logical conclusion and designed what became known as the 'pig tower' (or *varkensflat* in Dutch). What was officially named *Deltapark* was a plan for a 6-storey building, a kilometre in length. It was meant to contain 300,000 pigs, 1.2 million chickens, a slaughterhouse and a salmon nursery (De Wilt et al. 2000). The ideal location would be somewhere in a large seaport such as Rotterdam, near the supply of cheap grains and usable wastes from the food industry. The facility was projected to be largely self-supportive and to produce no environmentally damaging emissions. The manure would be used to generate bioenergy, for heating greenhouses on the roof and fertilizing mushrooms in the basement. Pig feed in at the entrance, pork out through the exit, and windmills on top. Even the pigs would be better off this way: they would not be transported alive and would live in stable groups, both of which reduces aggression, and would be provided with more space than in their current

³¹ Around 2010, Dutch pig farms contained on average about 3000 pigs, which is more than double the number of pigs per farm in 1995. Also, in other sectors of livestock husbandry, the average farm grows continually, with similar trends in other countries.

housing; in one version, the pigs would even have a balcony to go outside and enjoy the fresh air.

In this visionary, integrated design most of the problematic aspects of intensive pig farming were claimed to be solved by technological means: ‘the kind of farms that can arise if the problems of the environment and animal health, yes even animal welfare, are purely solved by technology’³² (Thinktank 2000, 33-34). The design also was a logical solution for the land-use planning challenge of how to adequately situate economic activities and deal with the problematic side-effects of intensive farming. Some commentators considered that the projected ‘industrial ecology’ was a large-scale version of the organic farm and its (in this design at least partially) closed substance cycles. In fact, it was argued to be the only way that the number of pigs raised in the Netherlands could ever be given the amount of space required for organic farming without severely encroaching upon human living space (De Wilt et al. 2000, 5; MVRDV 2001). The *agroparks* would result from integrating the industrial production processes from several sectors and the knowledge from various scientific disciplines (Smeets 2010). Besides being a highly efficient form of land use, it would optimize agro-logistics by reducing transport distances and combining flows of substances. And the planned design, informed by life-cycle analysis (De Wilt et al 2000, 18), would maximize the resource and energy efficiency of pig production (Smeets 2010). Also, it would minimize the risk of contamination with viral and bacterial diseases in a completely closed system that does not involve transporting live animals from the premises. The agropark concept was part of a new trajectory for the technological organization of farming, understood as an encompassing ‘system innovation’ (De Wilt et al. 2000; Grin et al. 2004), to be realized by semi-governmental organizations engaged in ‘transition management’ (InnovatieNetwerk 2004).

The plan was revealed to the press by the Dutch minister of agriculture on 4 October 2000 —‘World Animal Day’— on a boat trip with harbour officials, ostensibly searching for a suitable location for the design. The proposal instantly raised a storm of protest in the national media. A heated debate ensued in which all kinds of actors came to the front. Farmers, rural organizations, public figures, and animal

³² Already in 1997, a Master’s student at the faculty of Architecture of Delft University of Technology had come up with a similar design, also including a slaughterhouse and deducing its rationale from spatial planning and its dimensions from the internal logic of intensive pig farming (Berghauser Pont, 1997).

welfare organizations all denounced the project on their own terms, while making allusions both to fascism and Stalinism (InnovatieNetwerk, 2004).³³ Later that year, the scheme was turned into an artistic design, 'Pig City', by the Dutch architectural firm MVRDV. A computer generated three-dimensional rendering of 44 towers, each rising an incredible 622 meters high, graphically depicted millions of pigs in their integrated industrial ecology, each floor including trees and a balcony on which the inhabitants could search for truffles (MVRDV 2001). These 44 towers would contain the entire pig production of the Netherlands meant for export. Another 32 towers would be distributed throughout the country near urban areas. For many critics, this depiction visually represented the ultimate endpoint of the catastrophic rationalization of meat production. Meanwhile, the design also provided a three dimensional pictorial representation of national pig production statistics, resembling the isotypes Otto Neurath developed in the 1930s (Neurath et al. 1973; Patteeuw 2003).

In 2006, the plan was again proposed, but this time there was a concrete project to actually build an 'agroproduction park' in the harbour of Zaanstad. However, after vehement discussions, the town council did not approve of the plan, in part because of the limited amount of employment generated by the highly automated facility. By 2007, the concept of the *varkensflat* once again gained prominence in the Dutch popular media, but now as a term to designate the large but more conventional pig farms, with up to 30,000 pigs, which were being planned in rural areas. These facilities (not high-rises, but with at most two floors) were the largely unintended outcome of zoning policy measures to move intensive agriculture away from residential areas and nature reserves. The large scale 'mega-barns' did not offer the same environmental and animal welfare benefits as the initial pig tower designs, though some improvement was realized by 'end of pipe solutions' such as air filtering systems. In the meantime, a few 'agroproduction parks', which were more true to the original pig tower idea, had reached the planning stage, but they were met with fierce resistance from a coalition of environmental activists and local

³³ This public reception had been foreseen in the original report: 'The husbandry system described above requires considerable changes in (social) views: provinces and municipalities should be prepared to allow pig flats in agri-industrial areas; the public opinion should consider such a system of production and housing animal friendly; the public and agrarian sector should accept the change of family farms to really industrial production of pig meat. Currently these conditions are not met' (Thinktank 2000, 34). In analyses of the public response, it was thought to have 'an image problem with consumers' (De Wilt et al. 2000, 18) or, in hindsight, a matter of 'communication not adequately dealt with' (InnovatieNetwerk 2004).

residents (Hoes et al. 2008). The researchers and designers who developed the initial scenario meanwhile turned elsewhere to create integrated agro-parks. In cooperation with local partners, they became actively involved in setting up 'Greenport Shanghai', a showcase of environmentally friendly, large scale agricultural production facilities, situated on 27 square kilometres of reclaimed land, and in one scenario involving a million pigs (Smeets et al. 2007).

In vitro meat

Another central trend in livestock agriculture, besides the increasing scale of production facilities, has been the breeding of ever more productive and efficient animals (Boyd, 2001). Especially pigs and broiler chickens are being equipped with ever improved conversion factors for efficiently turning feed into meat, as the animals are designed to invest less energy in superfluous behaviours and bodily features. In this trajectory, a technology that takes this development in agricultural production to its logical conclusion would be meat production without animals. This is currently the aim of various research and development projects on 'in vitro meat'. The goal of these projects is to produce muscle tissue from stem cells, without requiring the 'carrier organism' to grow it on. Theoretically, one could grow spareribs and chicken wings as cell cultures in a laboratory, though at the moment even a small filet of cultured meat is a considerable challenge.

Various techniques are being studied for application to attain these goals, ranging from scaffolding muscle cell cultures to techniques of 'organ printing' (Hopkins and Dacey 2008). So far, only a small amount of lab grown meat has been produced, as there are still several techno-scientific hurdles to surmount before tissue cultures with taste and structure resembling actual meat can be commercially produced.³⁴ One challenge is how to make the stem cells grow in a medium to form muscle structure. This was attempted by positioning the cells on a scaffolding structure, and by stimulating the muscle tissue with an electric pulse or mechanically. Recently, it was found that it is possible to induce growth of muscle stem cells without stimulation, by using ordinary Velcro as a scaffolding material (Langelaan et al. 2010). Another challenge for scaling up the process for potential commercial

³⁴ For the most part, the challenge is not considered a matter of producing the right taste. The meat industry has developed ways of infusing tastefulness into meat products of all kinds. One way of using this technique in meat production is not marketing it as such, but mixing it with normal meat in products such as sausages, thereby creating an object with an even more ambivalent moral character.

production is to produce less expensive nutrient plasma. Currently this plasma is an animal product (calf serum), which would need to be of vegetable origin (from algae, for example) in order to cater to vegetarians who might be willing to eat this type of meat, and to make good on the promise of completely doing away with animal suffering and environmental problems associated with livestock farming (McHugh 2010). Some researchers have decided to move from undifferentiated (embryonic) stem cells to muscle stem cells for making meat, as the former are considered too controversial with potential consumers. Notwithstanding the remaining technological barriers, the principle of having stem cells grown for meat production is considered 'potentially feasible' (Van der Weele 2007). This has led animal protection NGOs to welcome the promise of in vitro meat, and promote the funding of research efforts. In particular the North American animal rights organization PETA (People for the Ethical Treatment of Animals) has embraced the research and development of in vitro meat, by offering a prize of a million dollars for any organization that creates a commercially viable product and brings it to market by June 30, 2012 (PETA 2008a).³⁵ By creating this prize, PETA set the terms for what it considers a beneficial meat product: not only should it be 'indistinguishable from real chicken flesh', neither product nor its development should involve animal testing or 'contain or [be] produced using animal-derived products, except for starter cells obtained in the initial development stages' (PETA 2008a).

In the Netherlands, in vitro meat has featured in the popular news media primarily in the science and technology sections. A popular-science TV program in 2006 issued a prize for coming up with a good name, to replace the Dutch name of *kunstvlees* ('artificial meat') or the commonly used *kweekvlees* ('cultured-meat'). Coverage in this particular popular science media genre indicate that the reports focus mainly on the techno-scientific possibilities of microbiology and the research challenges for being able to produce meat in the laboratory (Noorderlicht 2006). But, in vitro meat is not only a research project situated at universities and funded by governments (in part indirectly, as side projects to tissue engineering research for regenerative medicine). In some countries (such as Australia and France) it has also, or even primarily, featured as an art project: a few 'bioartists' working on 'disembodied cuisine' have even come to be considered as experts in the field (Langelaan et al. 2010). These projects are situated in the art world, in museums and art galleries, where in one project a living frog was displayed while in the same

³⁵ The deadline was extended from the initial date of June 2010.

room previously grown tissue (allegedly) obtained from the very same frog through biopsy was being prepared for a public meal (Catts and Zurr 2002). Cultured meat at this point is still in the process of development, and it cannot be taken as a clear-cut future object with a definite shape or self-evident qualities: its development is bound to encounter difficulties with mimicking 'normal' meat, and in contending with the specific demands and 'hesitations' of potential consumers, as well as unexpected high costs, resource use, and risks.

Both technologies –in vitro meat and pig towers– have given rise to media attention and public debates. Pros and cons of these proposals have been brought forward, their potential impacts have been assessed through analytical approaches such as life-cycle analyses (Tuomisto and Teixeira de Mattos 2011) and applied ethics (Hopkins and Dacey 2008). But the dynamic process involving these designs and their subsequent discussion is more complex and far reaching. This has become clear already from the variety of techno-political trajectories and public reactions I have just reviewed. More is at stake in these struggles and debates than the technical character and potential realization of these proposals.

3.3 The dynamics generated by pig towers and in vitro meat

Both new proposals simultaneously imply a (critical) depiction of existing production processes, while thoroughly redesigning those processes. The intricate combination of discovery and invention embodied in the proposals include shifts in both material and symbolic ways of engaging with the world. I shall describe such technological designs as 'world disclosing': (1) not only do they occasion particular political assemblies, but they also (2) demonstrate new issue definitions and (3) give rise to new moral subjects that emerge out of the struggles and debates.

Political process: How things generate issues, debates and publics

As I noted, the early designs of pig towers occasioned heated debates. The issue the publics responded to (and called into being) is the question of assessing the proposed technology: what to think of putting half a million pigs in a high-rise industrial facility? This was the immediate question that was put on the public agenda with the initial design scenario. But the impact went beyond mere agenda

setting, which would presume standard political institutions populated by already configured actors and representatives.

First of all, a different, and in this case larger, set of concerned actors coalesced in response to the proposal than would have been the case had the usual participants in environmental or farm animal welfare debates convened to discuss current farming practices. The radical proposal assembled a public that extended well beyond those groups that would have been directly 'affected' by a decision to build such a facility, such as people living near the projected 'mega-barns', who were concerned about health, traffic safety, and the quality of their open landscape. But the extremity of the pig tower design, and the cultural 'soft spot' it apparently managed to touch, made a larger portion of the public think of this design and respond to it. Such a reaction occurred even with the pig tower proposed for the 'non-space' of the Rotterdam harbour, which would directly affect no local inhabitants. Interesting coalitions emerged along with these responses, producing new possibilities for agreement, as both farmer organizations and a number of animal spokespersons protested strongly against the proposal. In their protests, however, the agricultural representatives mainly stressed the 'Stalinist' character of these 'collectivized farms' (Telegraaf 2000), the more urban 'cultural elite' animal spokespersons tended to draw comparisons with the holocaust (for example, De Jonge 2000; InnovatieNetwerk 2004). In contrast, environmental (rather than animal) NGOs exhibited a more complex reaction: 'it could indeed improve emissions' and 'at least it could be a way to break the lobby of the farmers', so that it would be easier to make the entire intensive farming industry leave the country. The realization of the design would provide leverage to break the coalition between the farmers and a rural population that identifies with farming, and reduce the cultural role of livestock farming in the Netherlands. However, a general sense of shared opposition to the radical pig tower design remained, which also ran through the national parliament and across the Dutch political spectrum. Both the Socialist Party ('has the minister gone mad?') and the Liberal Party (VVD) ('I wonder whether the minister is level headed') refused to take the proposal seriously.

In 2007, in the southeast of the Netherlands, a scheme for an 'agro-production park' gave rise to local protests. A plan for a facility in the village of Grubbenvorst was presented, which would combine poultry and pig farming with energy production and a slaughterhouse. The assemblage was named 'New Mixed Farm' (*Nieuw Gemengd Bedrijf*), evoking the traditional mode of farming that still provided its own inputs and used its own outputs (Hoes et al. 2008). Concerns voiced by local

residents about increases in traffic and zoonotic diseases were dismissed as belonging to the NIMBY ('Not in my backyard') repertoire in what was essentially a spatial planning issue. But together with the environmental NGO *Milieudefensie* (the Dutch 'Friends of the Earth'), which saw its base of activists widen from a mostly urban, left wing, highly educated constituency to include a broader rural constituency, the concerns about large scale intensive agriculture were voiced in more general terms. The public conception of large-scale intensive pig farming thereby shifted. In a rural setting, the term *varkensflat* appeared to kindle broad opposition to supersized mega-barns, even though there was always a danger that the coalition of actors on the multiple issues involved would fall apart again. When local residents claimed: 'This type of facility belongs in an industrial zone' (Trouw 2007), the wider issue of animal welfare and local worries over health and traffic were again separated (Termeer et al. 2011).

With the in vitro meat proposal, new coalitions also were forged, and new sites emerged for exchanging arguments and visions. In February 2010, several renowned animal activists and the Dutch science museum staged a public debate on in vitro meat, under the heading 'Pure Meat', attracting a crowd of over a hundred participants. Members of animal activist NGOs found themselves sitting beside molecular biologists and holding discussions with a variety of politicians and entrepreneurs. The aim of the science museum meeting was to generate debate among relevant actors on the possibilities for cultured meat, and ultimately to encourage commitment to that potentially viable technology. The meeting culminated in the central actors involved signing a petition to the government to invest in more research.

On this occasion, the debate repeatedly turned to the current situation of meat production and its unsustainable feature, but also interesting is who was *not* present at the gathering: namely, farmers. The animals were represented by their self-proclaimed spokespersons: animal rights and animal welfare NGOs (*Varkens in Nood* and *Dierenbescherming*). Basically, everybody else with a stake in the various issues around livestock farming was there, or somehow represented, though nobody publicly mentioned the absence of a farmer or of the farm lobby. In public debates over the pig tower, which overtly aimed to do away with independent farmers, they were still present and had their say. In the in vitro meat assembly, they were no longer considered relevant. Another gathering around in vitro meat occurred a year earlier, at a stakeholder meeting set up by a combination of natural scientists, philosophers and social scientists studying various aspects and implications of in

vitro meat. At this occasion, the chair of the Dutch Vegetarian Society (*Bond voor Vegetariërs*) participated in a creative discussion on the future of food, along with a researcher from a large meat packing division of Unilever, representatives of the ministry of agriculture, and food designers.

However, in vitro meat not only promoted new coalitions, but it also created rifts within existing organizations. Some turmoil was generated by in vitro meat while it was still in its early phases of R&D. When, as mentioned earlier, the North American animal protection organization PETA decided to put up a prize of a million dollars for the first commercial in vitro meat product, this decision caused 'a near civil war' within its board, as some members felt that this technology would only strengthen the immoral idea that animal flesh is to be eaten by humans (Schwartz 2008). So instead of bringing different interests and views together in one coalition, as initially happened with the opponents of the pig tower, in vitro meat divided critics of current practices in animal husbandry.

Shifting issue understandings

The debates on projected pig towers and in vitro meat inevitably also moved towards scrutinizing current practices of animal farming. Comparisons were often made between the projected situations and existing problems, especially in formal assessments and policy analyses of the schemes (Langelaan et al. 2010). The pig tower design can be understood as a response to the Classic Swine Fever and Foot and Mouth Disease crises in the 1990s, which had recently raised public dismay about agricultural practices and their regulation. In what was proposed as a way to reduce the complexity of the system and make it easier to control, the high-rise facilities would order the 'chaotic' practices of farmers and eliminate the untraceable movements of animals (Bos 2004). The design would preclude farmers from ignoring regulations and reduce the possibility of transmitting diseases through contact with wild animals. Existing practices were thus revealed as chaotic and unruly. With the pig tower, specific characteristics of current livestock production were proposed to be dealt with in innovative ways: CO₂ and methane emissions, the elimination of transporting live animals, the use of land and scarce resources, and the energy efficiency of production. Even though the potential effects of this type of livestock management on animal health and the risk of disease outbreaks remained controversial, comparing the qualities of the agro-production park with current conventional pig farming showed that the new design offered an improvement on almost every ethical variable (Thinktank 2000). Notably, the harm to animals would be reduced, as they would not be moved around in trucks, and

each animal would be provided with more space than in current conventional farms. The transport, not only of live animals but also of feed, which is involved in the current system of livestock farming is highlighted by both pig tower plans and the in vitro meat project, as both emphasize the costs and environmental emissions associated with such transport. As the new agro-park design was set-off against current pig production practices, those practices were implicitly evaluated on these terms. Even though the proposal was almost universally derided and dismissed, the current problems it highlighted were explicitly considered as ethically important by all actors in the field. For instance, people who normally would not speak out or even have a position on these issues stressed the environmental costs and animal welfare problems of live pig transport. In an analysis commissioned by the government to understand the resistance against the pig tower proposal, an overview of critical arguments against the design noted problems with current agriculture: 'The large scale, the perceived negative effects on animal health and animal welfare, and the loss of autonomous family farms in the rural area, appear to have generated the most resistance.' The report mentioned corresponding advantages of the plan, such as 'less towing around with animals, beneficial impacts on the environment and landscape, and reduced risks of livestock diseases' (Innovatienetwerk 2004). In many subsequent discussions on the future of intensive pig farming in the Netherlands, even when not explicitly organized around this proposal, the concept of *varkensflat* figured as a frame of reference. By attracting various criticisms, the designs even drew attention to broader concerns and alternative proposals. One such proposal for closing global substance cycles was to make up for the extraction of nutrients through imported soy pig feed by shipping manure back to South America to refertilize the land.

'Cultured meat isn't natural, but neither is yogurt. And neither, for that matter, is most of the meat we eat. Cramming 10,000 chickens in a metal shed and dosing them full of antibiotics isn't natural' (In vitro meat scientist Jason Matheny, quoted in: Sandhana 2006). People involved in the project of creating in vitro meat implicitly as well as actively define current livestock farming as deeply problematic (Haagsman et al. 2009; Langelaan et al. 2010). By emphasizing the moral importance of this product more than the potential market value, they publicly claim that current livestock would be better off without having been born, and that environmental and other concerns require drastic measures to be taken. Viable cultured meat promises to eliminate many concerns about meat production and consumption. If this technology were to be fully developed it is expected to make

more efficient use of energy and raw materials, to greatly reduce environmental emissions, and to terminate animal welfare concerns (Tuomisto and Teixeira de Mattos 2011; Bhat and Fayaz 2011). The discussion highlights new problems, indicators and criteria of sustainability, such as the resources used with conventional meat production, and the spatial requirements of the globally growing demand for animal protein. When the proponents focus on (the promise of) improving environmental costs, and resource and energy use, they produce detailed descriptions of the current burdens on the agricultural sector. These include emerging risks of zoonotic animal diseases and their impact on humans, and the impact of the preventive use of antibiotics. They also argue that existing meat production is an inefficient way to produce protein. The *in vitro* meat scientists promise improved conversion factors over current beef and pork production, and they stress improvements in hygiene over current farms and slaughterhouses.³⁶ But, most notably, the possibilities claimed for *in vitro* meat production include a complete absence of animal suffering that would set a new standard of animal welfare on which to compare farming practices. The utilitarian calculus in arguments for livestock production would no longer be offset by the estimated utility for human consumers. Now, proponents of live meat production would need to claim that it is in the benefit of farm animals to live their productive lives.

Even before it has been shown to be a viable technology, cultured meat has started to have some impact on the understanding of the issues of livestock farming among participants in discussions of its development. In the ensuing public discussions, new 'ontological' struggles emerged. With the stem cell based alternative, meat becomes differentiated into various types of meat that compete with one another in terms of purity and authenticity. Willem van Eelen, the elderly pioneer of *in vitro* meat jumped up at the science museum debate to exclaim: 'Do not call it artificial meat, this will be real meat!' *In vitro* meat can be considered to be an 'as-yet undefined ontological object' (Stephens 2010), which severely unsettles not only our central categories such as living and non living, organic and inorganic, plant and animal,³⁷ but also helps reimagine our ideal relations to non-humans and articulate

³⁶ See, for example, Langelaan et al. 2010: "the production process can be monitored in detail in a laboratory, which could result in the elimination of food borne illnesses, such as mad cow disease or salmonella infection."

³⁷ See, for example, Haagsman et al. 2009, for a discussion of the possibilities for producing a plant based growth medium: 'by using recombinant-DNA technology it has become possible to let plant cells produce such animal proteins.'

how to think about culturally important forms of land use. Also, the imagined and experienced meaning of dead and living bodies becomes open for reinterpretation: traditional meat eating can come to be seen as eating a 'corpse' while eating in vitro meat can be thought of as eating something both hygienically clean and morally pure. From the side of a traditional meat eating culture however, lab produced in vitro meat thus far is defined as lacking in authenticity and meaning, with one renowned organic butcher calling it 'soulless meat'.

So far pluripotent muscle stem cells have only been successfully isolated from mice, rats, rhesus monkeys and humans. Attempts have been made as part of the in vitro meat project to culture embryonic stem cell lines from pigs, which sustain self-renewal while retaining pluripotency. This effort has proven difficult, as porcine stem cells are found to require different in vitro conditions from human or mice stem cells (Du Puy et al. 2011; Wilschut et al. 2010). Stressing a need for pig (or chicken) stem cells discloses that it is still a particular type of animal cell from a particular species that is to be eaten. The taboo on consuming human flesh is maintained, but some commentators play with connections to deep-seated cultural taboos, by highlighting the reality for many people of a strong and embodied moral and political commitment against eating flesh (Warkentin 2006).

The importance of language for discussing moral concerns on animal farming is generally attested by the struggle over descriptive labels such as 'factory farming' in the US and '*bio-industrie*' in the Netherlands, as well as the commitment of many authors in the field of animal ethics to using the term 'non-human animals'. Language is of central importance for the two cases I discussed: farmers refuse to call their farms *varkensflat*, which their activist opponents are all too keen to do, as it has become a derogatory term to dismiss all large scale animal farms. The search for an appealing name for in vitro meat that would diminish its monstrous character and focus attention on its potential benefits is still going on, as it is clear to everyone involved that the name will be important for its eventual public acceptance. Often the names that are proposed as well as the associated imagery stress the ambiguity of the products. 'Labchops', 'petrimeat', 'meat 2.0', 'vatbeef' and 'test tube burgers' were some of the entries in the Dutch contest, or were puns that emerged from magazine articles. All of these terms highlight the hybrid character of being artificial and to some extent alive, while some other names stress the associated moral advantages: 'happy meat', or 'animal free meat'. At the same time, we can imagine that, following the introduction of in vitro meat and broad public acceptance of it,

the normality/abnormality associations may become inverted. At some point in discussing in vitro meat, terms will need to be devised to describe 'normal' meat: perhaps as 'animal meat', 'dead meat', or 'cadaver meat'. Accordingly, the new product would open up a new perspective on what to consider normal and acceptable. This possibility reveals that new technologies can give rise to new concepts and vocabularies, while at the same time getting their meaning from the language used to describe them.

New moral subjects and new forms of political agency and responsibility

As a third element of the world disclosing process, the designs interfere with understandings of the character and scope of moral agency. Where the current mode of meat production had been seen as a given situation that emerged from traditional practices and the undirected interplay of technologies and markets, it now emerges as something that needs to be either consciously preferred, continued and improved, or stopped altogether. While companies involved in the current form of production often refer to consumer preference for cheap meat as a driver of intensive farming, they are now confronted with political choices. These choices emanate, not only from parliamentary politics –where there is a tendency to relay decisions about farm animal welfare to scientific techniques and consumer choice, such as in the EU Welfare Quality project (Roe et al. 2011; Law 2009)– but also from the challenges brought forward by these new technologies. The Dutch government struggled at several levels with this new (moral) view on its various governmental forms of agency, both in its role as regulator, as funder of innovation (subsidizing in vitro meat research and agro-park development), and as spatial planner (on questions of whether to allow for mega farm development). The two technologies induced two very different types of normative agency for deciding on the future of animal agriculture: where the pig tower arose as a political and spatial planning issue, in vitro meat emerged mostly as a matter of techno-scientific research and individual consumption. Debates over large scale agro-parks were in part locally driven by community protests, while deliberations over in vitro meat were not linked to any local constituency. In neither of the designs did humans figure in any active way as part of the eventual production process. And animals were only roughly sketched as three-dimensional renderings in the computer generated towers of MVRDV, and schematically depicted at the start of the flow charts abstractly explaining the making of in vitro meat.

Various parties developed their positions as moral and political subjects of the new technology. Not only did these technologies strike a chord with particular interest

groups, but these 'relevant social groups' (Bijker 1995) also formed in the process of designing and materially interpreting those technologies. The shared dismissal of the pig towers and the broad fascination with in vitro meat implied quite radical positions and moral roles in relation to existing farm practices. Prior to the pig tower design, farmers saw themselves confronted with either consumer demand or with governmental requirements, but now they had to respond to newly emerging publics, and to reinvent themselves as having a professional but still intimate relationship with animals, which automated high-rise installations would not offer. As one pig farmer responded when presented with an overview of the benefits of an *agropark* during a public discussion on a pig tower project in Zaanstad: 'But we can do all that too!' To which the manager of the *agropark* consortium retorted: 'But you don't!' Consequently, these proposals dismissed farmers as moral subjects capable of improving farming practices. Both technologies ignored the practice of farming as meaningful in itself. The farmer and his or her skills in these plans were rendered superfluous or relegated to a luxury niche market. Alternatively, they were changed beyond recognition, such as when some pig tower proponents emphasized the possibility that farmers could rent a floor in a high-rise agro-park, literally realizing the 'vertical integration' of the agro-food industry.

The idea of in vitro meat drew attention to various concerns that inform ethical lifestyles, such as vegetarianism, as it induced a potential redefinition of the relation between meat and the slaughtering of animals. With both techno-scientific projects, environmental and animal welfare NGOs had to redefine themselves in relation to the production of meat, and to struggle internally in order to develop positions towards their shifting constituencies. The animal rights NGO PETA, as part of the prize they offered to create animal free in vitro meat, published a recipe for a fried chicken dish as a prescription for 'real meat'. One of the criteria for receiving the prize was: 'Produce an in vitro chicken-meat product that has a taste and texture indistinguishable from real chicken flesh to non-meat-eaters and meat-eaters alike. Judging of taste and texture will be performed by a panel of 10 PETA judges, who will sample the in vitro chicken prepared using PETA's own fried "chicken" recipe. The in vitro chicken must get a score of at least 80 when evaluated in order to win the prize' (PETA 2008b). Even though PETA argued that in vitro meat propagation was aimed at those people who 'cannot kick their meat eating addiction', for some within the organization, the proposal seemed to concede to the importance of meat as a culinary craving. Meanwhile the PETA leadership defended its promotion of in vitro meat as a pragmatic rather than morally pure strategy (Schwartz 2008).

At the same time, the microbiologists involved in researching and developing in vitro meat attempted to create meat without causing any animal suffering, and claimed to worry about even the least infringement of animal bodily integrity. Part of the in vitro meat research program aimed to produce an alternative to the commonly used bovine calf serum as a growth medium for stem cells. 'Since no other animal sources are wanted in the process of in vitro cultured meat, conventional culture medium, which is commonly supplemented with fetal bovine serum, has to be adjusted' (Langelaan et al. 2010). In part, this aim was motivated by the fact that the exact content of the existing animal serum growth media was unknown and variable (Haagsman et al. 2009). But, beyond this consideration, the in vitro meat project apparently led the tissue engineers to commit to the ethical ideal of veganism: of not intentionally killing or even harming a single animal during food production. These microbiologists –members of a profession that is not generally known for a commitment to avoiding any form of animal suffering–stressed how the biopsy used for obtaining the stem cells would not need to kill a single animal. The source animal often was sketched as leading a princely life for the rest of its days in a sanctuary after undergoing the minor inconvenience of this biopsy. However, at least one prominent in vitro meat scientist indicated that 'he would not like to see the field dominated by the animal welfare issue, since environmental and public health issues are such important drivers for his research' (Schwartz 2008). The in vitro meat technology even led some meat culturing biotechnologists to organize an 'international alliance of environmentally concerned scientists', in an effort to get funding for research to produce muscle tissue on an industrial scale (Stephens 2010).

The in vitro meat proposal thus managed to reconfigure its central actors, sometimes almost beyond recognition. It led them to take up moral positions and commit to practices that otherwise would seem far removed from their public stances. Even the nature of the moral subject and its embodied experience of moral concerns was at stake. A common first response on the idea of eating the lab-grown meat was one of physical disgust (Van der Weele 2011). Often this initial gut reaction, which was interwoven with moral judgments, was later articulated in more rational terms that stressed the benefits of avoiding the suffering of future farm animals. During debates on in vitro meat, the moral relevance of this embodied form of appreciation was discussed and the appropriate bodily response was reimagined. The expression of disgust over eating in vitro meat recalls the 'yuck-factor' in bioethics, but proponents of the technology imagined that it would eventually be overcome through rational assessment of the moral situation and the

character of normal meat. Accordingly, the sense of disgust was treated as a cultural convention to be transcended (Pluhar 2010) or a response that could just as well be redirected at conventional meat. Here (moral) agency emerged as a matter of deliberation on how to be bodily affected.

With this third aspect of moral world-disclosure, in which technological designs afford the development of particular forms of moral subjects, it is clear that the subject/object divide is as much an outcome of the process of grappling with new technologies as it is the self evident starting point for assessing something new. However, this does not necessarily mean that political positions are materially determined, or that moral subjects are completely dissolved in processes of technological development. In the following section I delve into the work of Dewey and Heidegger, in order to understand the normative and ontological processes occasioned by in vitro meat and pig towers.

3.4 Dewey, Heidegger and the dynamics of moral world disclosure

Heidegger and Dewey help us to highlight several aspects of the deeply ambiguous process of world disclosure that is brought about by the two technologies. By now, it should be clear that there are various ways to understand the pig towers and in vitro meat and their societal meanings. An initial, superficial understanding of these controversies can be summarized in terms of Dewey and Heidegger's philosophies. First, the designs can be thought of as thoroughly pragmatic solutions to the problematic situation of intensive pig farming. Accordingly, the towers would provide the animals with a little better life than they have now –the pigs could be housed in a system that, in an ironic term derived from the tourism industry, has been labelled 'comfort class' (Bos et al. 2006). Dewey and Heidegger have previously been called upon to interpret the peculiar nature of politics concerned with scientific controversy and technological change (Latour 2005). Dewey is helpful for highlighting the ways in which issues 'bring their own publics into being by affecting them somehow' (Dewey 1954; Bohman 2000; Marres 2007; DiSalvo 2009). In the technological proposals I discuss, 'being affected' can be found to include being intrigued, fascinated, repulsed, or in some other way moved into action beyond directly being harmed. Accordingly, the designs can be thought of as 'things' in the Heideggerian sense in which material objects are considered as *gatherings* of

relations, etymologically connected to the ‘thing’ as a premodern communal parliament (Heidegger 1971; Latour 2005, 23; see also, Harman 2009, 138; Storni 2012).

Technologies that render Heideggerian thinking mainstream

In Heidegger’s terms, both designs are essentially the same: extreme instances of technological optimization that subsume everything to the ‘enframing’ (*Gestell*) mode of thought, in which our entire existence is to be optimized and turned into a ‘standing reserve’. Even though the pig towers and in vitro meat may be the wrong way of responding to the place and the moral quality of farming, in a pragmatic sense they allow for the containment of industrial optimization in a few locations, whether in labs or in towers. Heidegger would probably reject the possibility of spatial – as well as mental or philosophical – compartmentalization, but this way of localizing the *Gestell* mode of calculative thinking on some remote and uninhabited spaces would leave abundant room in the rest of the world for conserving nature in a pristine state and cultivating a more authentic relation to the land. One could say, though, (arguably consistent with Heidegger) that our commitment to these technologies would still mean our world is disclosed as standing reserve, in terms of the hubristic desire for total control inherent in modern technology. While arguments in favour of the proposals are overtly ‘pragmatic’, the critiques of both the pig towers and in vitro meat tend to align with the Heideggerian style of dismissing modern technology on metaphysical grounds. In this vein, for critics (such as those who voiced opposition to PETA’s prize), culturing meat is ‘just the wrong kind of thinking’, as it emphasizes that meat is for human consumption. It reduces animals to being ‘mere bioreactors’, as Donna Haraway (2008) has argued. In Heideggerian terms, the pig tower would mean radically unearthing the peasant who was the model ‘dweller’, essentially connected to the environment; a human being who has a true and authentic, immersive (*zuhanden*) relation to (handicraft) technologies and to the land. Several media responses to the pig tower scheme equated the plan with the holocaust, thereby expressing a mainstream variant of an infamous remark by Heidegger, in which he compared the holocaust with modern agriculture.³⁸ Indeed, the implication is that, with this type of design for total

³⁸ ‘Agriculture is now a mechanized food industry, in essence the same as the manufacture of corpses in the gas chambers and death camps ...’, runs the infamous quote in translation, though in German it says *Ackerbau* for agriculture, thus pointing at arable rather than animal farming (Schirmacher 1983). The character Elizabeth Costello in Coetzee’s (2003) novel by that name makes a similar comparison between the slaughter of animals and the holocaust, thereby alienating herself from the people around her. It is therefore remarkable that with

control, humankind is at stake in the debates over both technologies. So, why not also integrate humans into the industrial ecology, to fully complete the substance cycle? A columnist with a major Dutch newspaper made a cynical suggestion to include a home for the elderly in the pig tower, calculating that a million pigs could heat the homes of 30.000 elderly citizens (Knip 2000). And why not eat lab cultured human cells, since the taboo on cannibalism would be lifted for such meat without an organism? An advantage would be to shortcut substance cycles, to render our own flesh as part of the optimizing calculative rationality. By extrapolating the technologies to include the way we relate to human nature, the unsettling character of the proposals is emphasized and the audience is shocked into questioning the mode of thinking behind them. Through their unsettling character these technologies allowed for –or even rendered mainstream– radical critiques that normally are dismissed as irrational or utopian.

In line with both Dewey and Heidegger, the particular worlds disclosed by these technologies are highly specific for a certain space and time: the early 21st century (and particularly Dutch) cultural experience, media landscape and political as well as techno-scientific institutions around agriculture and meat. In a different ‘meat culture’, in vitro meat using stem cells might be so alien as to do little to unsettle an ontological and moral order. Or, in a different farm culture, a pig tower would seem too outrageous to propose. For instance, Dickson Despommier in the US proposed a ‘vertical farm’ including chickens, but decided against including pigs.³⁹ Or, as with the ‘Greenport Shanghai’, projecting a million pigs housed in a single facility may seemingly not produce any moral unease.

On actively relating to processes of world disclosure

When the critiques of in vitro meat and pig towers are redirected towards existing industrial agricultural practices, the non-neutrality of the purely technological way of thinking is disclosed. In Heidegger’s terms, these technologies are revealed as merely the final versions of a metaphysics that turns everything, including living

the arrival of the Pig Tower proposal, what was a marginal and highly controversial position (Patterson 2002) suddenly becomes broadly considered as a plausible and widely accepted analogy through which to understand and discuss industrialized farming.

³⁹ ‘You can’t raise— well, you can raise pigs inside [the vertical farm] if you’d like. A lot of animal rights people would object to that so we’ve eliminated that as a possibility. But no one objects to chickens. I don’t know why’ (Despommier 2009).

animals, into material for efficient use. But they actually disclose a world by revealing how this works to a wide public. The designs make explicit that technology is not merely a neutral set of objects we can choose to use, but also comprises a way of thinking and discloses a particular world. The public grappling with these technologies then moves towards an appreciation of how in contemporary agricultural practices and debates we are already thinking completely in terms of efficiency and optimization, which can be contrasted with other, more meaningful modes of engaging with agricultural concerns.

Heidegger warned that technology tends not only to reveal our world and ourselves in a particular way, but also hides the fact that it is a particular way of revealing (Heidegger 1977). The technological projects we discussed instead highlighted not only their own extremity but also a mode of thinking of which they are the endpoint. We may thus be witnessing what Heidegger calls 'the unfolding of the essence of technology'; an essence that contains the 'saving power' within itself (Riis 2008). Many have wondered how to understand the puzzling fragment from the poet Hölderlin: 'But where the danger is, grows the saving power also' that Heidegger quoted in his 'questioning' of technology (1977, 28). We could understand it to mean that we need to take the calculative technological rationality to its extreme in order to disclose our haphazard ontological predicament of being enframed by technological reason. Technology then is deeply ambiguous: on the one hand it completely turns the world into a standing reserve, at the same time this total enframing taken to the extreme can make us aware of the process and open up ways to 'gain a free relation to technology' (Heidegger 1977, 33).

With Dewey, we can understand the process of world disclosure in a to some extent similar vein. The proposals could be considered part of an experimental form of creative inquiry, which integrates technological design, scientific research, and artistic imagination (Dewey 2005). Rather than remaining locked up within the old routines of thought, these technologies provide an opportunity for 'dramatic rehearsal': trying out fresh attitudes towards our everyday practices, which may result in a collective exploration of long called for solutions to pressing societal problems. In this process, and with his concept of experience, Dewey offers a way to understand the bodily, affective nature of the publics that emerge around issues, as it is not so much shared interests that give rise to new collectives, but shared experiences (Bennett 2010, 100). This type of understanding of the embodied political subject would promote e.g. taking the 'yuck' response to in vitro meat not as a merely subjective feeling in the face of a new object, but as a relevant response

to a shared cultural commitment. Politics of this material kind is an ongoing process of public experimentation (Latour 2004; Gross 2010), in which ethical concerns are dealt with in part by practical tinkering rather than through discussing and applying moral principles to new situations (Mol 2002; Korthals 2004).

Often in discussions of their work, Dewey is treated as a champion of deliberative democracy, and contrasted with Heidegger, the anti-democratic or even anti-political mystic (Rorty 1976; 2005; Bohman 1994; Kompridis 1994).⁴⁰ Is dismissal of these technologies a mere gut reaction to be overcome by rational debate, or an expression of deep seated moral concerns that are central to people's understandings of the world and of themselves? The broad public consensus that emerged about our two examples appeared to be that in vitro meat is a case of the former, while the pig tower was a case of the latter. The reception to these technological proposals thus comprised a struggle over which arguments were relevant, and which contributions to consider appropriate for debate (Davies 2006). With Dewey and Heidegger, we can overcome the tendency to treat these reactions as either emotional or rational, a dichotomy based on an absolute and static subject/object distinction. Different types of 'arguments' are brought to the fore, and their relevance is decided in an ad hoc way. And, as was the case with the public rejection of the pig towers, even a (Heideggerian) refusal to engage in logical argumentation and propositional thinking can be broadly agreed upon.

Technologies functioning as art

Both Dewey and Heidegger consider art to be the primary or ideal form of disclosing our moral world. For Dewey, subjects emerge from partaking in culture, in imaginative experience. As he was quoted already in the introductory chapter: 'The sum total of the effect of all reflective treatises on morals is insignificant in comparison with the influence of architecture, novel, drama, on life' (Dewey 2005, 359). Dewey, as opposed to Heidegger, does not contrast art and techno-science as mutually exclusive modes of world disclosing, but describes his ideal of integrating both modes. 'Even technological arts, in their sum total, do something more than provide a number of separate conveniences and facilities. They shape collective occupations and thus determine direction of interest and attention, and hence affect

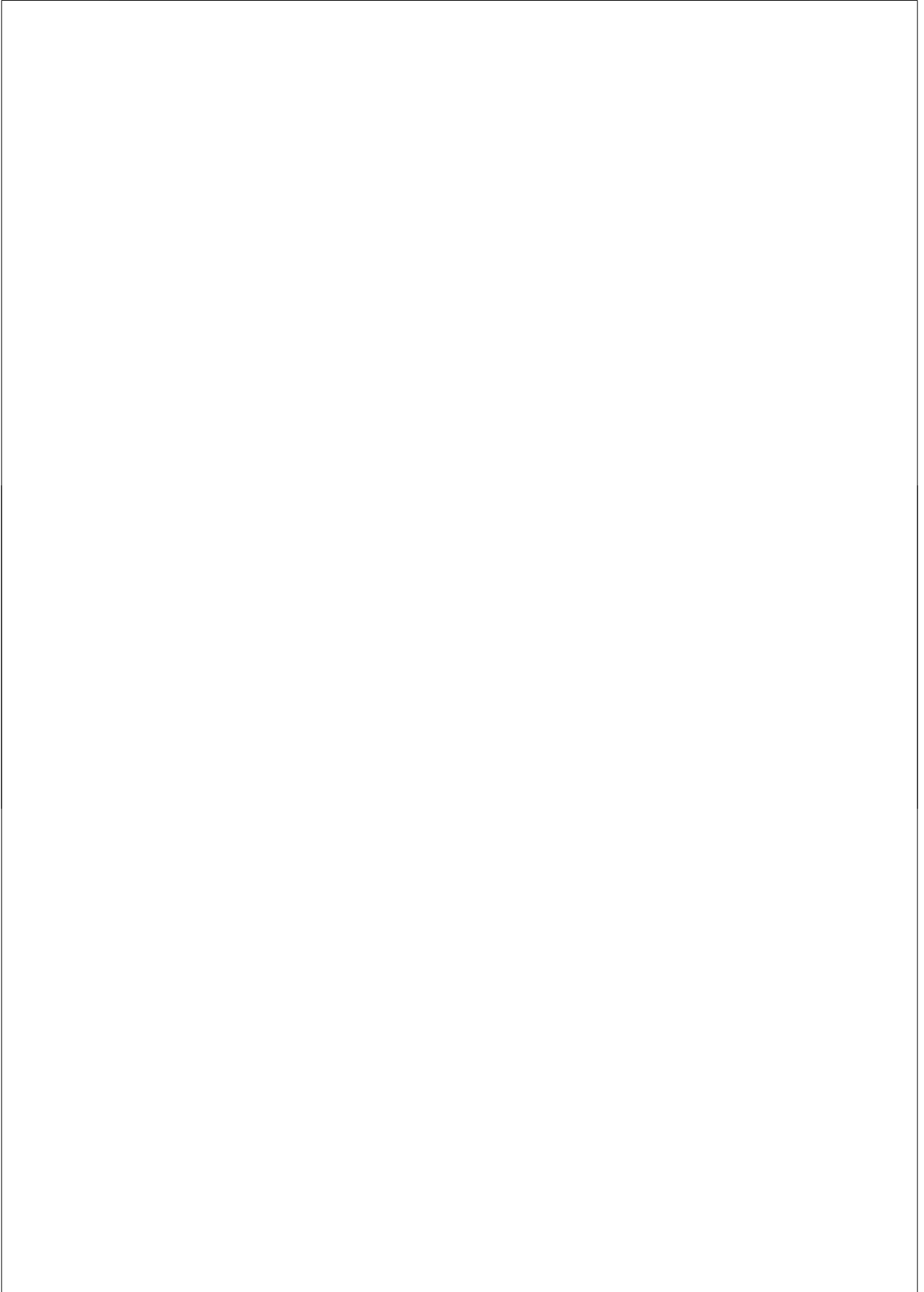
⁴⁰ Though, for others, it is Dewey who poses a threat to democracy, with his 'equation of inquiry with scientific experimentation', thereby being 'excessively optimistic about enlightenment rationality', while 'lacking a dystopian sensibility for the technocratic threats of science' (Feenberg 2003).

desire and purpose' (Dewey 2005, 359). For Heidegger, integrating art with technology requires a return to the classical Greek meaning of *techne*, in which poetry and crafts were not yet separate. The high-tech works of art I discuss here open up worlds, though not by evoking the rich experience of farm life the way Van Gogh's peasant shoe did for Heidegger (1971), but by overtly reducing agriculture to the efficient conversion of nutrients into easily digestible proteins.

Besides being techno-scientific research projects, our two examples both also have functioned as works of art, making the distinction and the difference between these forms of world disclosure less clear cut.⁴¹ Lab based bioartists performing in a museum (Catts and Zurr 2002), and architectural designers extrapolating existing practices into evocative designs (MVRDV 2001), have managed to blur the boundaries between art and technology. It is through art projects that the proposals are extrapolated to the extreme, but art and design also generate newly meaningful ways of relating to late modern meat production. Especially in these creative explorations of the two technological proposals, both technologies can be envisioned, not as cases of utter alienation from agriculture situated in a remote industrial zone or invisible lab, but as renewed and perhaps hermeneutically embedded relationships to food production. A variant of the pig tower scheme is then projected as an example of 'urban agriculture', bringing city dwellers back in touch with how their food is produced. (Bos et al. 2006; Stroom 2009). Could a well designed pig tower then not merely function as a way to optimize agricultural logistics, but also as a way to involve a variety of publics in agricultural practices, all the while improving the situation for the pigs as well? And, could in vitro meat production, for instance when designed as a kitchen appliance (Electrolux 2009), function as a 'focal thing' (Borgmann 1984) that brings us closer to food production and gives rise to new meanings in shared practices? Perhaps these possibilities could even lead us to imagine the ultimate form of hospitality, enabling us to prepare and offer our guests a 'piece of ourselves', thus allowing for the creative development of new rituals that resonate with various religious practices. If designed well, these may be high tech ways to overcome the means-ends and subject-object divides in the metaphysics of modern technology, while at the same time they avoid reverting to the nostalgia that merely idealizes traditional farm practices, thereby deepening debates and expanding moral imaginations. We may

⁴¹ For more examples of how conjunctions of art and science can produce shifting definitions and practices of politics, see Gabrys and Yusoff (2011).

not agree with the desirability of these proposals, whatever form they will take, but with Dewey and Heidegger, we can appreciate how these things offer occasions to discuss existing moral concerns in a new light, forge new political coalitions and develop new moral identities.



Part II

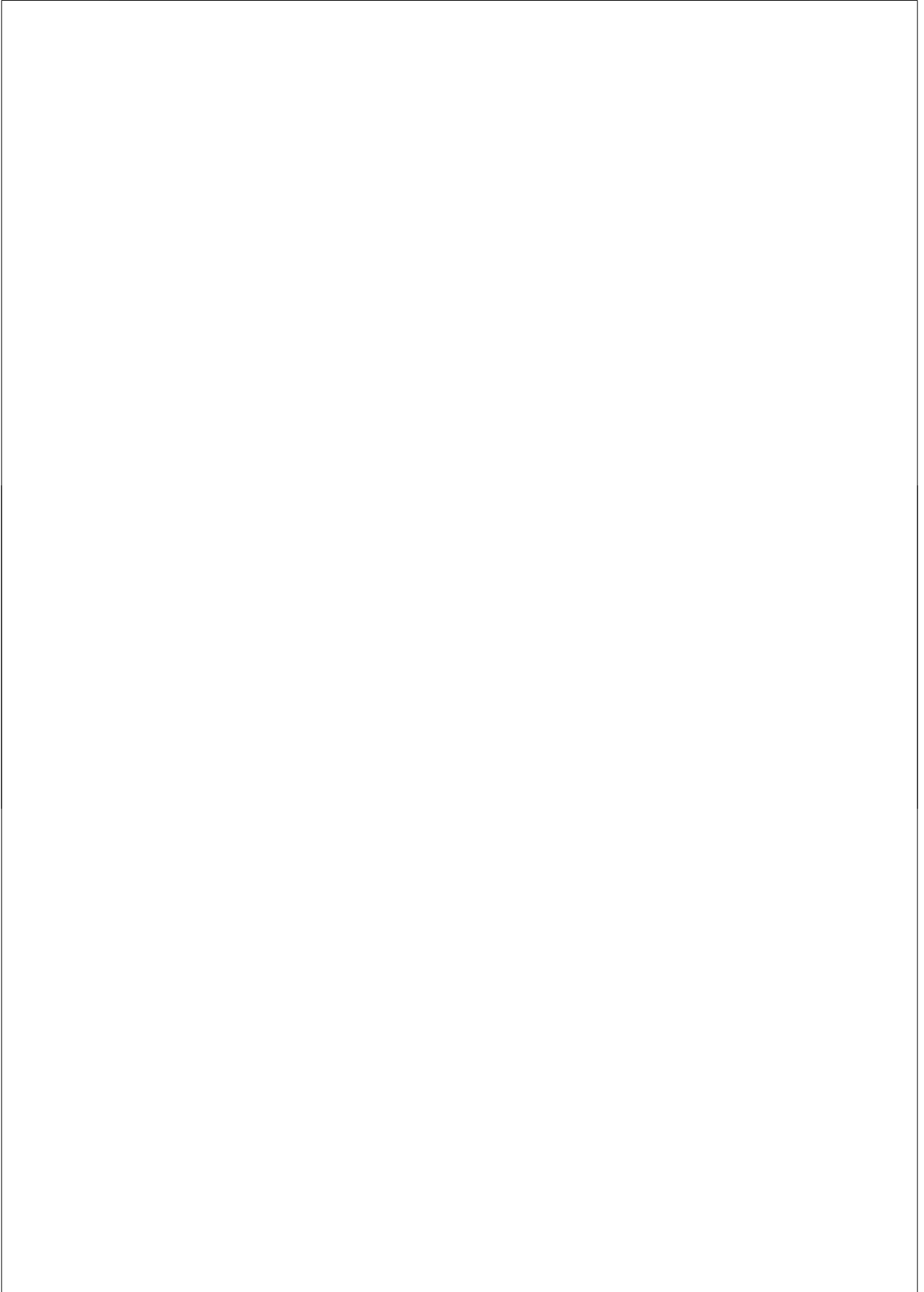
Milking robots

The previous part offered a description of the ways in which farmers engage with the ethical concerns on their farms, and an analysis of how technologies may lead to debate and a critical re-imagination of existing practices. In this part, these two ideas are combined in order to provide a detailed view of the process of co-evolution of ethics and technology on the farm, focusing on a relatively new technology: the milking robot.

Chapter 4 describes the ways in which this technology gave rise to new ideas on animal welfare and farm labour quality. Ideas which subsequently fed back into the way the robot is used and how the wider *automatic milking system* is arranged. Co-evolution of ethics and technology is found to be a matter of tinkering, in which cows play an active role as well.

But if this is the case, can this process of animal responses to human tinkering and interpretations of the emerging human-animal relations then also be understood as political, yes, even of a deliberative nature? That is the question delved into in chapter 5.

This part ends with an intermezzo, in which an experiment is depicted and described of a visual mode of conceptual analysis, showcasing an alternative role for a philosopher to intervene in processes of co-evolution and contribute to (animal) deliberation.



**Cows desiring to be milked?
Milking robots and the co-evolution of ethics and technology**

4.1 Introduction⁴²

Since the 1960s, the milking of cows (in the Western world) has mostly been done using a milking machine rather than by hand and bucket, as had been common since the dawn of dairy agriculture (Van Adrichem Boogaert 1970; Bieleman 2000). A milking machine consists of a pump connected via tubes to teat cups, in which a pulsating vacuum simulates a suckling calf or the milking hand of a dairy farmer. The farmer, or an employee, milks eight to twelve cows simultaneously in a milking parlour by attaching the teat cups to the udders of the cows that have been made to walk into designated individual stations.⁴³ The movement of the cow is restricted for the duration of the milking while she receives a ration of concentrate to ease her behaviour. In one early morning and one late afternoon shift,⁴⁴ the cows are fetched from the meadow in summer or driven from their housing area to the milking parlour. Each shift for the milker consists of one to two hours spent in the milking parlour cleaning udders, attaching teat cups, and checking the condition of the cows while watching over the milking process. Some would say it is drudgery, something preferably relegated to an employee. However, for many the discipline of the early rise and the daily routine of 'harvesting' is the central and most rewarding part of

⁴² Published as: Driessen, Clemens, and Leonie Heutinck. 2014. Cows desiring to be milked? Milking robots and the co-evolution of ethics and technology on Dutch dairy farms. *Agriculture and Human Values*. (Online first)

⁴³ In more large-scale operations this can be up to 30 cows, a situation which is common for instance in parts of the US. This introduction describes the common situation on dairy farms in the Netherlands.

⁴⁴ Though for instance in the south of the Netherlands on many farms milking tends to be done according to a later rhythm, something that is sometimes ascribed to the region being Catholic rather than Protestant.

being a farmer: getting into a state of ‘flow’ with the machinery and the animals, interacting with the cows, and checking on their individual condition in turn, while enjoying the efficiency and the swiftness of the process. This is often carried out with an implicit idea of cooperation between human and animal—notwithstanding the occasional cow that accidentally, or on purpose, kicks off the milking device. It is often said that most important strategic decisions in dairy farming are made ‘in the pit,’ where the farmer is concentrating, absorbed in the work, and creating mental space to mull things over. This means that the act of milking becomes an exemplary moment in which the modern dairy farmer, in one of the few such remaining roles in our society, integrates manual labour with strategic management and entrepreneurship (as we saw in chapter 2).

In many cases, though, milking is left to an employee or the task is divided among the family, especially when multiple generations share in the farm work. In very large dairy farms with over a thousand cows, which are common in parts of North America, another division of tasks emerges in which employees work in shifts around the clock to continuously milk batches of cows, often in large carousel systems (e.g. Zellmer 2012). Good (skilful) employees, considered to be necessary in the Netherlands, are increasingly difficult to find, though. And Dutch farmers do not always want to become ‘personnel managers’—or find that they are incapable of taking on this role—and try to avoid hiring external labour (*vreemde arbeid*) (Booij 2004; Debergh 2007).

As an alternative to the common milking parlour in which, two or three times a day, all cows are milked in groups, a device has been developed that does the milking automatically, without the direct intervention of a farmer. In the Netherlands, as well as in other (developed) countries the world over, the number of automatic milking systems (AMS) replacing conventional milking parlours on dairy farms has been increasing since their commercial introduction in the 1990s. Thousands of farmers operate one or more of these devices (e.g. Huiden 2009), most of them located in Northwestern Europe (Scandinavia, the Netherlands, Germany, France, and the UK), although some can be found in North America, Australia, and New Zealand.⁴⁵

⁴⁵ As of 2012 in the Netherlands, more than 2500 farmers operate an AMS, which means over 10% of the Dutch dairy farms, while over the past few years about a third of new milking installations were robotic (Stichting KOM n.d.). The use of AMS in North America is expected to rise as well, for instance, by the manufacturer Lely (Hoard’s Dairyman 2012).

In farms with AMS, individual cows visit the milking robot according to their own inclination, and are mainly motivated by a supply of concentrates offered in the milking box during milking. With the use of sensors, cows are identified by the system and abnormalities in the milk can be detected. Dedicated software stores operational data, milking reports (i.e. daily average per cow, amount of milk, interval between milkings) and milk quality parameters (Koning and Rodenburg 2004). The management program enables the farmer to control the settings of the system (Meijering et al. 2004). Cows that show abnormalities or have not visited the robot for more than a set period are identified and placed on a so-called *attention list*. These cows are to be checked upon by the farmer, and can (in some setups) be put into an enclosed *waiting area* that they can only leave by visiting the robot.

In this chapter, I will describe the emergence of this new technology and explore its implications for ethical concerns regarding both farmer and cow welfare. I will argue that these implications are essentially ambiguous and impossible to interpret unequivocally, as the terms in which to evaluate them and the understandings of the experiences of both farmers and cows are found to change as part of the introduction and use of this device. Nevertheless, I believe that continual debates on interpreting the shifts in practices and discourses are important in order to critically assess and inform technological innovation processes. This is especially important because these changing views on what constitutes a good life for a cow and a farmer, I will claim, are not all merely cases of salesperson rhetoric, but actually also attest to the relevance of normative concerns in technology development. Thus, the moral ideas that changed with the use of a robot can actually be found to feed back into how the robotic system is used and laid out, leading to ongoing techno-moral co-evolution.

4.2 Conceptual background: co-evolution on the farm

In various fields that study technological change, it is now commonplace to see the relation between technology and society as one of ongoing mutual influence. From the philosophy of technology to innovation studies and various (other) branches of science and technology studies (STS), the core assumption is that change is to be conceived of as a process of two-way shaping. The terms used to describe this kind of process may differ, and accordingly the domains that are thought to interact: the “coproduction of science and social order” (Jasanoff 2013) or the “co-construction of

society and nature” (Latour 1992), the “co-shaping of technology and society” and “socio-technical” (Bijker and Law 1992) or “techno-moral change” (Swierstra, Stemerding, and Boenink 2009). Starting from the same basic premise, this thesis unsurprisingly corroborates this idea of a two-way influence between technology and society/culture/morality. What may however make it a worthwhile read, is that it offers a particular take on how we could understand this mutual shaping process in more detail, and especially how we could think of ethics as part of this process; And, thereby, how moral subjects may relate actively to being influenced by their material environments.

Even though the various proposed terms do not diverge much in the way the authors mentioned use them, the notion of co-evolution is appealing, as it implies that what people come to consider to be valuable is not the endpoint of a kind of moral progress, nor the inadvertent side effect of technological production, but rather a matter of continuous adaptation to circumstances. The co-evolution metaphor perhaps risks making ethical thought into a rather blind and relativist affair; ethics as merely the outcome of chance variation in whatever happens to be the socio-technical selection environment of particular moral norms, understandings of subjects, etc. The only recommendation or even ideal could then be to foster ethical variety, from a hope that a kind of ‘moral biodiversity’ would contribute to societal resilience. This is perhaps not altogether a wrong idea, especially when both the variation and selection are not fully ‘blind’ after all, but involve intentions and choices by human and even non-human agents.

We then can see ourselves actively experimenting with novel ways to live, to relate, and to argue. Evolution in biology increasingly is seen to occur not only by ‘variation and selection,’ as a blind and unidirectional affair, but also by horizontal exchange between organisms, through parasitism and symbiosis (Hird 2010). In this version, the obviousness of organism boundaries, especially in processes of change, is severely undercut. While at the same time, perhaps paradoxically, biological processes of co-evolution should not be thought of as lacking meaningful communication and agency (Despret 2013). It goes probably too far to stretch the metaphor into a precise model of the intertwinement of ethics and technology, but it does make for more interesting implications of labeling this as ‘co-evolution.’⁴⁶

⁴⁶ Co-evolution moreover is a common notion in understandings of agricultural innovation that consider the adoption of new technologies and the development of knowledge as intertwined with alternative ways of

Thereby the term not merely suggests seeing how technological artefacts and systems 'influence' something or some variable we may call 'ethics', and vice versa.

For the milking robot case study, this co-evolutionary understanding would mean the characteristics of cows, farmers, and robots depend on how they relate to each other and to the wider fabric of the world. In the empirical research of the process of ethical appreciation of the milking robot I do not just look at changes in the discourse on dairy farming, but also trace changes in the farmers and cows themselves, and how these feed back into the design and layout of the robot.

Earlier dairy farming co-evolution: from tie stalls to loose housing

Earlier innovations in dairy farming have also shown processes of co-evolving material change and ethical understandings. For example, the switch from the tie stall to loose housing in cubicle barns that occurred (in the Netherlands) around the 1970s, was motivated by various factors and considerations. Not only was there a development towards increasing the scale of farms and decreasing the amount of labour, also the working conditions of farmers had become a matter of concern, whereby the hard manual labour required by the tie stall was increasingly thought of as unacceptable (Van Adrichem Boogaert 1970). The change in housing system was accompanied by a shift in what were considered to be desirable and allowable practices with regard to the animals. For example the dehorning of the cows was deemed necessary in loose housing, but had been highly controversial a decade earlier (Bieleman 2000; Van der Ploeg 2003). Reluctant farmers viewed the new loose housing as messy aberrations to good farming practice. While tying up cows to constrain them on a single spot, which was common practice in the old tie stalls, has nowadays (again, in the Netherlands) generally come to be considered highly undesirable from an animal welfare point of view. In organic farming it is now mostly ruled out, and for calves tying up has been prohibited in the EU. Nevertheless, in a number of European countries the tie stall still is common, even in

organizing agricultural practice. This is seen to include policy, legislation, infrastructure, funding, and market developments, involving competing worldviews and redistribution of costs and benefits (Klerkx, Mierlo, and Leeuwis 2012). Geels has furthermore pointed at the multiple levels at which this process of co-evolution takes place: new innovations emerge in niches, compete with established socio-technical configurations, overarched by a societal level of slow cultural and material change (Geels 2005). This thesis does not explicitly grapple with this work in (agricultural) innovation, though it does figure in the background, and it will be interesting to see what implications may be drawn from acknowledging particular roles of ethics 'in transition'.

countries that have seen extensive debates on animal welfare, such as Nordic and Alp countries (e.g. Simensen et al. 2010).

Ethics in co-evolution?

When the changing character of ethical norms and priorities cannot be taken as a sign of moral progress, does it mean that ethics is merely a matter of alternating fashions? To understand the ethical question in this dichotomous way, I argue, would arise from an expectation that what is ethically right is supposed to have a universal and a-temporal character. Ethical principles and norms, in this view, need to be applied in a local context, but can ultimately be understood as separate from and transcendent of these contexts. By acknowledging or even embracing the dynamic and co-evolutionary character of ethical norms as changing together with material practices, the possibility of making ethical judgments would seem to be precluded. Instead, this chapter starts from a pragmatist understanding of ethics which, as Keulartz et al. (2004) have highlighted, is more geared towards accommodating moral change and has closer affinity with the relational and fluid ontologies of sociotechnical co-evolution.

One of the central tenets of pragmatism is the disavowal of granting dualisms ontological status. Dichotomies such as mind and body, rationality and emotion, subjective and objective, are not basic and given divisions of our world. In Deweyan pragmatism, ethics emerges in the experience of problematic situations. This type of ethics is dynamic, situated, and centralizes experience, understood not just as a purely subjective affair that organisms privately undergo, but as both passive and active, as doing and undergoing (Dewey 2005), as bodily and mental, comprising both affective encounters and skillful engagement with the world. This conception of experience makes for an approach to ethics that allows for a self-evident role of both farmers and—so I argue—also animals when considering ethical concerns on the farm. Not as ideal liberal subjects: rational, autonomous, atomistic individuals, but relational characters immersed in practices. The thick description of everyday experiences, and how farmers and animals communicate these, is then an appropriate way to promote ethical reflection and debate (as was argued in chapter 2).

Other approaches to ethics that similarly start from a relational and fluid understanding of humans, animals, and technologies have over the past decades been developed by Whatmore (2002) and Haraway (2008). In exuberant styles, these authors have crafted alternative forms of relating to “companion species” and

“intimate assemblages of corporeal becoming.” The ethical call in these approaches amounts to learning to be open, to tune in, and to seek to encounter “mindful others.” Not by extending humanist models of subjectivity and rights to a select group of higher mammals, but by becoming aware of the various ways in which our language and material practices contain species hierarchies, make us overestimate our human specialness and prevent us from more truly encountering and imaginatively responding to a variety of living beings.

Does this mean ethical concern is to be extended to non-human objects too? Extending Latour’s ‘actor-network’ orthodoxy—in which humans and the entire variety of non-humans alike are to be considered *actants*—may seem to suggest such a thing (Risan 2005). Is there then no difference between a cow and a robot? In practice there are numerous: a farmer may occasionally talk to a robot, but probably only while swearing when it malfunctions, never kindly, when it operates as expected. The robot is unlikely to ever be caressed; only perhaps kicked. When a robot would be kicked, the farmer may experience embarrassment upon believing someone else saw it, or be worried this might affect the warranty, but when kicking a cow a farmer may experience a sense of shame (Harbers 2002; see also James 2009, 41). What counts as communication between farmer and cows can as well be part of the co-evolution process of material arrangement and ethical understandings: The appropriate relation between farmer and cow in a tie stall was found to be one of close personal contact and care. With a robot, the farmer cow relation changes from caring for the animals, towards allowing the animals to take good care of themselves (Heutinck and Driessen 2007).

Thus what a cow is, and how best to relate to her, is the outcome of ongoing processes of socio-technical change. And while especially with the modern high yielding dairy cow it is hard to say where technology stops and the animal begins, this however does not preclude a genuine ethical stance towards them: even stronger, acknowledging the deeply technologically mediated relations of interdependence can also be thought to give rise to the moral challenge of learning to become what Haraway (2008) calls “response-able.”

This type of ethical theorizing and research does not offer recipes for justifying moral positions and producing logically straightforward moral arguments. Embracing co-evolution and disbanding more formal modes of moral theorizing for many involves the risk of losing ethical ground and giving up critical terms such as “natural,” “autonomy,” “freedom,” “exploitation,” and “alienation” in a flurry of

techno-enthusiasm (see Crist 2004; Weisberg 2009). In this chapter I will trace in detail how these terms on the one hand can be found to lack stable meanings in a dynamic technological culture, while on the other hand—through being contested—they still perform vital work in making sense of changing experiences and moral commitments.

Common approaches to farm animal welfare

A pragmatist outlook on ethics focuses on what particular approaches to ethics mean in practice. Each scheme of institutionalizing farm animal ethics entails not just a distribution of moral agency—who decides what a good life is for animals, but also particular ways of defining the central issues. When “animal welfare” (rather than “animal rights”) is thought of as the central issue in livestock farming, (intensive) animal production is commonly assumed to be an acceptable or even desirable form of animal use (Holloway et al. 2013). And when animal welfare is thought best decided on by consumers in supermarkets, this means animal welfare will be defined in ways that allow for easy commodification, such as outdoor access (Buller and Roe 2012). The resulting notion of welfare lends itself to marketing and can be made to appeal to the imagination of consumers, or is thought to have implications for food quality and taste. Alternatively, when animal welfare is primarily a matter of state regulation and enforcement, different parameters may become prominent, such as those that can be objectively counted and measured (Veissier et al. 2008; Roe et al. 2011). There has been a drive for “animal based parameters” to define animal welfare more scientifically, e.g., in the EU “Welfare Quality” project. In practice though, also these parameters are defined through on farm measuring, and thus involve negotiation and interpretation (Roe et al. 2011). Apart from implicit decisions on what makes up a good life for a farm animal—one that is natural, stress free, or healthy (Fraser 1995)—animal welfare science tends to bring a particular focus and situatedness, if only for studying animal subjectivity in confined spaces (Johnston 2013). Even in the standardized conditions of laboratories, welfare has been found to be “multiple,” not easily defined on the level of species, but dependent on contexts, on qualities and life histories of particular animals, environments, and humans relating to them (Davies 2012). Notwithstanding all these hidden choices and variation, ‘animal welfare’ tends to be used as if it is a (generic and objectifiable) quality of species of animals. Both farmers and animals as active and idiosyncratic beings are absent in most approaches to welfare. Notions of animal welfare that would fit the experience (both affective registers as well as professional skills) of farmers are easily neglected in public debate and policy making, as we saw in chapter 2 (Driessen 2012). And

besides farmers, also animals can be thought of as similarly experiential: not just passive 'recipients' of welfare, but learning new skills too—something that is salient with the AMS.⁴⁷ Meanwhile the 'welfare' of farmers is not an issue of public debate or policy making, beyond health and safety regulations and basic rights of farm workers. Though in agricultural technology development this (the character of the resulting work for the farmer) is one of the core values and grounds for marketing, especially in situations where most manual labour is (at least in part) done by the farmer and his/her family, such as on most Dutch (dairy) farms.⁴⁸

4.3 Empirical approach

The research for this chapter was conducted between 2007 and 2010 and involved the analysis of discourse on milking robots and practical experiences with these in farmers' magazines, in the promotional material of robot producers, in scientific literature on the impacts of robots, on dedicated dairy farming web forums, and through interviews with three key AMS researchers. To be able to appreciate the different experiences of milking in a conventional milking parlour and with a robot, and to learn about the particular concerns that matter to farmers in this transition, I have participated in a week-long training course in dairy farming in which both systems were used and taught. My co-author of the article version of this chapter had previously studied cow behaviour during and after transition to an AMS (Ruis-Heutinck et al. 2001; Heutinck et al. 2004). The practical difficulties and the discussions among farmers were studied by joining several meetings of farmers' networks in which a group of farmers meets at a farm of one of the participants and discusses experiences, problems encountered, and possible solutions to these. The focal country of this research was the Netherlands, where the research and development of the AMS was pioneered by researchers and several companies, and in which a significant number of farmers has adopted and has been widely discussing this technology.

⁴⁷ This active process learning is also clear in the case of cows that are 'dedomesticated' and made to live independently in nature reserves (Lorimer and Driessen 2013).

⁴⁸ This means that in the Netherlands the milking robot, unlike other instances of agricultural automation, tends not to be considered as an alternative to migrant labour.

4.4 Ambiguous technology assessment

Technological determinism: farm technology innovators on a logical trajectory

With labour costs continuously rising, and considering the ongoing process of dairy farm automation—milking machines with automated uncoupling, automated feeding stations, robotic barn cleaners, and cow brushes—attaching the teat cups to the udders of the cow seemed the obvious next candidate for automation. From the early 1980s onwards, in several countries (notably the Netherlands, Denmark, New Zealand, the UK, and France) farm technologists were actively exploring the possibilities of using a robot to attach the teat cups. As the udders of each cow are positioned and shaped differently, this was found to require the recognition of individual cows, a programmed memory of the position of the particular teats, and how to attach the teat cups.

It became clear to these developers that this seemingly small and logical step in automation would entail larger changes in the setup of the dairy farm. As robotizing the farm worker in the conventional milking parlour would take too many robot arms or robot arms that were too complicated and therefore too expensive, a more efficient setup meant the cows would have to be milked one at a time. And for the robot to be worth the investment, it needed to work to its full capacity. In this way the newly developed device required a thorough change in the organization of the milking process.⁴⁹ This involved not only milking one cow at a time instead of the entire herd in batches, but also leaving it up to the cow to decide when to be milked rather than following the rhythm maintained by the farmer. This new requirement in turn led to numerous difficulties and adaptations of farm practices, of the robots, and of the cows. What ensued was not merely a robot, but a larger systemic change in the organization and layout of the dairy farm; hence the name was changed from robotic milking to the more encompassing term automated milking system, or AMS (Meijering et al. 2004).

Besides this inherent dynamic, as part of what might be a general, logical path of increasing automation of manual labour in any Western sector of production, other

⁴⁹ In terms of Akrich (1992) one could say the robot clearly came with a “script” that required certain behaviors of both human and non-human actors. This does not mean that thereby necessarily the robot everywhere produces the same behaviors and even discourses, irrespective of particularities of places and farmers. The potential differences in how AMS may be implemented and itself may be changed as part of regional “niches” of co-evolution is an interesting theme for further research.

storylines on the emergence of the AMS resisting this type of technological determinism can be traced as well. First of all, the inevitability of this technological trajectory can be questioned.

Nobody had asked for this 'technology push'

For a while the autonomous technology push of the farm technologists was met with skepticism. "Nobody had ever asked for this innovation," the farm ethologist Wiepkema pointed out in his farewell address (Wiepkema 1993, 3–4). He claimed, though, not to be opposed to the new device out of principle, but to be protesting against the positive expectations concerning its impact on cow and farmer welfare as claimed by technologists and researchers. He questioned whether farmers would be willing to leave the daily interaction with cows to a machine. And, speaking in 1993, he doubted whether cows, being herd animals, would be willing go to a milking machine voluntarily, as individuals, and questioned what kind of behaviour this system would encourage in the cows.

At some points, especially during the nineties, the fate of the AMS seemed uncertain. It was considered by many to be an overly expensive device.⁵⁰ In order to create a rationale for investing in it, the benefits needed to be expressed in financial terms somehow. Numerous studies calculated the cost efficiency of this labour-saving device and what its return on investment would be. *Time budgets* of farmers were measured to the minute, to set off the time gained against the costs of the system (Arendzen and Van Scheppingen 2000; Van Zessen 2007; Rodenburg n.d.). It was difficult, however, to put a price on the hours of a farmer, as he or she would need to work elsewhere to actually cash in on the saved time. Eventually, it was found that what the robot offered was not so much time gained, but increased flexibility. The value of this flexibility can be considered in divergent ways, as I will return to below. In the meantime, the cows were experiencing trouble with the robot. Their *somatic cell counts*,⁵¹ an indicator for hygiene and udder health, were measured in real time by the robots, only to reveal that these increased to alarming levels with the

⁵⁰ "Experience teaches however that this type of developments continue and that the results of it will be applied, even if it is not always economically warranted. Therefore also for the milking robot eventually there will be a future. All too high expectations however for its application in the short run do not seem warranted" (Mandersloot and Van Scheppingen 1991, p.30).

⁵¹ See also Atkins (2010, 247) on the broader historical shift in defining milk quality in bacteriological terms.

introduction of an AMS (Kruip et al. 2002).⁵² And the technical feasibility of developing a robust robot seemed difficult as well, because it often malfunctioned and was in need of repair.

Technology assessment in a hybrid, dynamic world

Were the initial problems related to the robots' ability to work reliably merely teething problems? Or were they learning processes of the farmers and cows, which meant that they could then deal adequately with the challenges of the transitional period of moving from conventional to robotic milking? In hindsight it can be (and is often) said that at first the robot was marketed to the wrong farmers (Hoefman 1998): most of the early robots were bought by "technology farmers" that were mainly motivated to do mechanical work and were less interested in spending time with cows.⁵³ With the milking robot, however, especially in its early days, there was a need for "cow-farmers,"—who are passionate about cow behaviour and welfare—as they would be able in an early stage to detect problems with the cows using this new machinery (Van Drie 2005). But at the same time, having the technologically oriented farmers pioneer these devices was necessary as they were required to constantly repair the still-rickety robots themselves. Stories surfaced of the failure of robots to adequately treat the cows and of detrimental milk quality (Kingmans 1999). Some robots, offered by disappointed farmers, appeared on websites selling second-hand goods—robots that were allegedly bought back by the robot company, which was afraid of bad publicity. In 2001, one Dutch milking robot producer (Prolion) even went bankrupt, in a flurry of financial scandal.

At some points it seemed that the AMS had ended up as a failed project: a promising and futuristic innovation in which a lot of time and money had been invested but that eventually failed to fully materialize as a viable system. It would have been difficult to pinpoint the precise reason for failure, though: Was it too expensive? Was it technically not feasible? Or was there merely a lack of social acceptance and demand?⁵⁴ Was it not loved by the cows, or did it not treat the cows right? Or was it

⁵² "I am fond of a robot, but the cell count is a problem on many robot farms. I have seen dozens of them [but] I am not sure what causes it. Not treating [the cows] in time, or too little checking up, or [farmers] believing it will be OK anyway" (Prins 2006).

⁵³ Several farmers and other commentators (implicitly) use the *farming styles* framework described by Van der Ploeg (2003) to explain the different farmer identities and their relations to milking robot practices.

⁵⁴ In several countries initial attempts to create a working AMS failed, such as in Japan, the US, and Germany (De Koning interview 2008).

that those farmers that loved it did not love cows enough? In this sense the milking robot resembles many pioneering technological systems, such as the automated transport system 'Aramis,' as described by Bruno Latour (1996). Latour explains this in terms of a relational ontology, in which technological devices are never mere independent objects, but always relational to their core. The functioning or not functioning of a technology is then the outcome of the ways in which it is being embedded in wider 'hybrid' socio-technical networks. In this process also what it means for a technology to 'function' is not given.

Assessing the impact of the AMS on dairy farming practice

How could and should this technology, and the changes it brings for the relevant stakeholders, be considered normatively? Simply listing the advantages and disadvantages of the new system compared to the conventional system can of course be attempted. The investment costs can be set off against the amount of labour saved. The welfare of the cows can be measured in a variety of ways in the previous and the new situation (e.g. Wiktorsson and Sorensen 2004; Weiss et al. 2004). Impacts on milk quality and production can be traced. During its development over the past decades, some have thus tried to assess the ethical implications of the systems, attempting to categorize the impacts this new device might have on various ethical concerns regarding humans and animals.

In 1994, after the first AMS arrived on the market, a technology assessment was performed, commissioned by the Dutch ministry of agriculture (De Boer et al. 1994). The AMS was considered to constitute a far-reaching change in dairy farming, and to be a technology that was bound to become widespread, though it was expected that some farmers would keep milking in conventional parlours. Although there were a few issues of concern to be addressed, the technology was deemed uncontroversial. The main focus of attention was udder health, which was related to the hygiene of the milking process, as cows' udders might not be cleaned adequately before milking. This was thought to be an issue that would be taken up by the sector itself, and mainly a technological challenge. In hindsight, increased somatic cell counts and udder infections are thought to be reduced by improving the teat cleaning by the robots. If problems persist, these are now blamed on general hygiene, cow health, and herd management, not on the robot per se (Svennersten-Sjaunja and Pettersson 2008, 40; Dohmen et al. 2010). This seems to imply that in order for the robot to function adequately, higher hygiene standards have become the norm on robotic dairy farms.

Further concerns were the increased energy use and the problems that operating an AMS would pose to the pasturing of cows in summer. Cows remaining indoors year-round due to robot use were expected to cause concerns regarding animal welfare and the image projected to consumers. It would be overly ironic if the device that is claimed to liberate cows in fact leads to them being locked up in the barn. Other studies into public views on the robots can be considered to reveal their inherently ambivalent character. A study into Dutch citizens' concerns regarding acceptable farm practices found that high-tech solutions such as milking robots were widely valued as positive because they increase the flexibility of farmers and the freedom of cows (Verhue and Verzijden 2003). More recently, however, Boogaard et al. (2011, 270) framed the AMS as part of an increasing scale in farming and an absence of farmer-cow relations in an empirical study into the public acceptability of agricultural modernization. They asked survey participants to respond to the statement: "If it is efficient and practical for a dairy farm, then it is acceptable that a dairy farm has 3,000 dairy cows and a few milking robots." The respondents in their study, in significant numbers, dismissed the technology, framed in this way, as being part of an "unacceptable development" (Boogaard et al. 2011, 273).

The moral ambiguity of AMS

An unequivocal assessment of the impacts of milking robots appeared to be a difficult task. In general, increasing the automation of work is considered to induce a process of alienation, especially in the dairy farming sector, which is still seen by many as revolving around human-animal relations (Hansen 2013). Cows in this type of high-tech environment can appear alienated as well, having been turned into industrial machines, and figuring merely as a means of production with closely monitored inputs and outputs rather than as unique living beings (Stuart et al. 2013). And large investment costs of complicated technologies and the associated requirement to gain benefits of scale are mostly considered to be in opposition to the ideal of family farming. But things appear to be more complex here.

Since its early marketing, the AMS has not only been sold to the farming public as the next logical step on the basis that 'the future cannot be stopped,'⁵⁵ but has also been presented as a good thing that is to be embraced as more natural and something that offers more freedom for both cows and farmers, e.g. Noordhoff

⁵⁵ For the often-encountered promotion of technology in this Janus-faced rhetoric of the "future industry," in which new technologies are described as both unavoidable and to be actively embraced, see De Wilde (2000).

(2009).⁵⁶ Is this mere *marketing rhetoric*, and does this freedom come at a price (Millar 2000; Holloway 2007), or does the AMS produce genuine improvements in the welfare of humans and animals? I will argue here that a normative evaluation of the AMS can only be understood as part of a wider shift in farming practices and in terms of an intricate co-evolution process between material changes (in technological systems and behavioural practices of both farmers and cows) and shifting ethical norms and meanings of central normative concepts. The terms in which to evaluate the practice appear to have changed with the introduction of the new device: new roles are configured, new experiences are generated, and relations change in character. And (perhaps) even the *nature* of the animals—and humans—involved is altered in the process.

Evaluating these new systems as ‘objects’ with qualities and listing the pros and cons of the innovation is, then, a task with at best only temporary results—but one that, nevertheless (if considered as part of a dynamic process), can play a role in ongoing development. Over the course of the last two decades, the AMS has become more embedded in certain farming practices, expectations have shifted, a new generation of farmers has emerged with different desires regarding leisure time and flexibility, and (most) cows in robotic systems have to some extent learned to adapt themselves to the new routine. In the following section this dynamic will be described in detail.

4.5 Co-evolution of ethics and AMS technology

Changing discourse on cows

With the emergence of the AMS, we saw the terms in which the system was assessed change. The new system generated lots of new and specific research questions for production-animal scientists, farm technologists, and business economists. There were new focuses and concerns for research projects (Koning et al. 2004). And for the farmers that were involved in pioneering these new devices or discussing their desirability, the AMS was a continual topic of discussion. This shifting discourse concerned both changes in what were central concepts to discuss cows in relation to

⁵⁶ “Next to that the cows have a free choice to walk indoors or outdoors. The pinnacle of animal welfare, don’t we want to choose freely ourselves” (“Grasbaal” 2009).

the robot, most notably freedom and voluntariness, and specific new meanings of concepts, such as naturalness.

Freedom

The opportunity for cows to choose when to be milked spawned a reformulation of animal welfare, partly in terms of individual freedom. One robot producer, Delaval, even thought it important to use an alternative name for the automated milking system: the *Voluntary Milking System*.

Freedom had, over the past decades, become one of the central concepts for defining and debating animal welfare, and is often associated with living in a state of naturalness and non-interference. In farming policies, animal welfare came to be defined in terms of freedoms after the 1965 Brambell report. From this report, animal welfare became commonly defined in terms of basic positive and negative freedoms, including freedom from hunger and thirst, fear and pain as well as freedom to express normal behaviour.

Critics of the development of the AMS questioned the liberationist claim and the voluntary nature of cows milking themselves. With the use of the robot, it was revealed that cows did not desire to milk themselves, as was originally expected. The fact that simply offering the opportunity to be milked and to relieve their udders was not enough to make the cows come within the optimal timeframe was argued to be a sign of not delivering on the promise of *cow autonomy* (Wiepkema 1993). A British ethical assessment of the technology was critical of early promises that surrounded the AMS of more freedom for the cows (Millar 2000). Some kind of food reward or forced routing appeared necessary in order to prevent the need for recurrent fetching of cows. Freedom for cows hereby did not meet the standard of *full autonomy*. In particular, the system of iron bars arranged in the barns around the robot to make the cows have a forced route through the robot to get from the resting to the feeding area was thought to undermine the voluntariness that was claimed for the AMS. Most AMS manufacturers and farmers are now moving away from set ups with forced cow traffic, as research has shown that cows in forced systems may be made to visit the robot more often, but do not produce more milk (Jacobs and Siegford 2012). Holloway (2007) has pointed to the paradoxical nature of the discourse emerging around AMS about the system generating more freedom for the cows and offering a more natural way of milking, in contrast to the efforts needed to make the cow go into the robot and the implications for cows that refuse to perform the required behaviour. Using Foucault's work on discipline and

subjectivity, he argues that the newly gained freedom for the cows comes at the price of being disciplined. Therefore it is freedom of a restricted kind in a system of routings that force the cow to go through the robot to arrive at feeding or resting places. But even in situations of 'free cow traffic,' the cows gained, or were granted, a new form of subjectivity, but in a Foucauldian sense became also subject to new forms of power and domination. This means that the arrival of the AMS should not be understood as a matter of the simple releasing of an inherent subjectivity which was suppressed in conventional milking systems (Holloway 2007, 1050). With this type of critique, however, in which the rhetoric of freedom for cows is unmasked to reveal more subtle forms of domination and control, the critics tend to take over the new norms of freedom, individual choice, voluntariness and even autonomy, as things that are relevant and important for cow welfare. *Cow autonomy* was expanded upon as a criterion of the ethical assessment of dairy systems (Millar 2000), a perhaps unlikely term to evaluate the life of what commonly is viewed as a herd animal. Thereby the co-evolution of specific norms with a technological development is found here to include those critical of that particular development. Alternatively, the finding that being relieved of the milk load is not enough motivation to visit the robot,⁵⁷ and the subsequent need for adjustments by the robot developers, can also be taken as indications of the active involvement of the animals in the process of technological design, rather than precluding the possibility of an agential and meaningful form of domesticated bovine subjectivity.

There are other signs that ascribing subjectivity to cows does not necessarily lead to them being fully dominated by farmers. Not only cows, but also, and in close connection to them, farmers acquire their agency, skills, and subjectivity as part of the same process of becoming 'robot farmers' with 'robot cows.' Moreover, in this process, farmers and cows are both actively engaged, learning their new routines and getting habituated to new human-animal relations.

Lazy cows, or incompetent farmers

A recurring theme in farmer's discussions of cows is their purported laziness. With the AMS the active behaviour of cows becomes salient and essential to the system. Sometimes cows are suffering from lameness that prevents them from visiting the

⁵⁷ This could of course have been due to the discomfort caused by early versions of the robot, as was suggested by an anonymous reviewer. Then it would be interesting to explore whether current robots are attractive enough to motivate the cows to milk themselves without food reward.

robot. But there can also be less visible reasons for a lack of self-milking activity. In farming circles there is talk of “lazy cows”, who do not move to the robot as required, without them showing any signs of lacking health as an excuse for their behaviour (Klop and Bos 2004; Van der Knaap 2008). This term implies that the farmers blame the character of the individual animals, for not behaving in the required way without good reason. It is then a variable that can be taken up in breeding decisions to see whether a hereditary factor is involved (Van der Knaap 2003a). For Holloway et al. (2014) this kind of talk of laziness of cows is an example of farmers ascribing subjectivity to cows that will lead to either disciplining them, e.g., by electrical prods, or culling. Alternatively however, in the farmer’s network meeting in which I was present, someone raised the possibility of the laziness being a matter of not receiving the appropriate diet. If cows consume too little starch, the fermentation processes in their stomachs may be disrupted. In that case, the issue is redefined from a matter of individual character to one of receiving not the appropriate feed. The cow appears anew. The lack of movement on behalf of the cow was not to be blamed on her deficient motivation, but on the attention and skills of the farmer in providing adequate feed. The farmer subsequently would need to experiment with alternative ways of feeding the cows.

This small example reveals how the behaviour of a cow is continuously subject to interpretation within the practice of dairy farming. A situation in which her agency and character are intricately connected to the material and human networks in which she is caught up; and in which the question of whether her behaviour is a legitimate expression of discontent with that network or something the farmer thinks can be blamed on her is a matter of continuous interpretation. A process in which the character and skill of the farmer is at stake as well, especially when viewed by his or her peers.

Naturalness

A related, centrally contested concept concerning farm animal welfare is *naturalness* (Segerdahl 2007). The importance and the very meaning of naturalness for dairy cows can be seen to have changed with the introduction of the new machine. In farmers’ magazines, as well as in the public media, automatic milking has been compared to calves drinking from their mother. One farmer with multiple robots has been surprised by the behaviour of some of his cows: “It is funny to see that some cows walk from the field straight to the far most robot, apparently these cows have a preference for a particular robot” (Van Raay 2003). The same farmer also has experiences with cows that are moved to a different part of the barn, with a different

robot, to “stand moo-ing for a day to the old robot, as a cow who has lost her calf.” These kinds of behavioural displays by the animals strengthen these farmers’ convictions that a robot comes closest to the natural situation. By relating these anecdotes when interviewed for professional magazines, farmers explicitly interpret the behaviour of the cows as recognizing the robot as in some way a *natural* part of their life.

Together with the claim that robots are more natural, a conception of naturalness to which humans are considered not to belong has gained prominence. Farmers, and thereby human-animal relations, are in this view ideally not a salient part of the natural environment of the cow, which implicitly claims that adding a high-tech automated device is. For instance, according to one robot producer: “[F]ast and quiet, yet very robust and gentle. Its repetitive procedures are consistent, just as the cow likes it [...] allowing cows to maintain their natural cycle” (Delaval n.d.). Hereby the traditional ways of milking dairy cows, by hand or by hand-operated machine,⁵⁸ with this new meaning of naturalness, are rendered *unnatural*. And with this notion of freedom to decide on the desired moment of milking, the conventional mode of milking is newly thought of as *forced*. The calmness of the herd instilled by the robot and the ease with which they learn and manage to operate the device are taken to be indications of increased naturalness. This brings us to the effects of the robots on the cows.

Changing cows

It is not merely the discourse of robot farmers and robot producers that changes with the adoption of the AMS. With the arrival in their barns of a robot, the cows themselves changed in a number of ways too. A finding that fits in with the relational and dynamic understanding of ontology in Actor Network Theory and ‘more-than-human geography,’ in which seemingly stable ‘natural objects’ such as dairy cows in fact can be found to continually co-evolve in relation to their socio-technical environments.

First of all the cows were confronted with new physical requirements. Some cows had irregularities in their udders or in the positions of their teats that the robot was

⁵⁸ Indeed, when all quarters of an udder are milked for the same length of time this is not natural. A calf would stop suckling a teat when there was no more milk—just as the AMS can do by detaching one teat at a time.

unable to detect or adequately clean and attach the teat cups to.⁵⁹ These cows needed to be culled, as did one or two cows that, after the transitional period of a few weeks of learning how to use the system, were not found able to acquire their now obligatory skills or refused to comply with the new regime. There were also instances where a large number of cows were found not suited to robotic milking, which may even mean the cows “win” and the farmer is forced to return to conventional milking technology.⁶⁰ Some farmers that installed robots were not able to make the system and enough of the cows work satisfactorily and saw themselves compelled to return to the conventional technology.

Cows (collectively) were not merely passive *end users* in the development of the automated milking system. At several points the behaviour of the cows surprised the technologists and pioneering farmers working to develop the robot. The first agro-technologists working on the idea of automated milking had not envisaged the eventual setup (Rossing et al. 1985; De Koning interview 2008). To the surprise of the pioneering companies and researchers, the relief of their milk load was not enough motivation for most cows to present themselves to the robot in time. They needed to be seduced or forced to visit the robot by the offer of some feed in an automated dispenser (Meijering 2004). In this way the robot revealed something about cows and their desires on being used in dairy farming.⁶¹ The cows needed to learn how to operate their part of the robot, which meant presenting themselves in time and standing still when being milked. This is done by a combination of operant conditioning (the feed offered upon visiting the robot) and habituation: “gently forcing” the cows through the robot to get them used to the experience (Davis and Jago 2002).

After earlier setups that emphasized “forced cow traffic” (Ketelaar-De Lauwere et al. 1999), in more recent years it is increasingly acknowledged that leaving the decision to visit the robot more to the cows generates more visits. For example on a dedicated web forum for farmers it is stated that: “Indeed, no fences runs better

⁵⁹ In 2010 a Dutch veterinarian started performing plastic surgery on cow udders to lift them so that they were connectable to the robot (Hofs 2010). In this way the cows were saved from slaughter, even though the veterinarian was breaking the law while performing invasive treatments on cows for which there is no explicit legal exemption.

⁶⁰ For instance Booij (2004) describes a case in which up to 20% of a herd refused to work the robot, which led to the farmer returning to a conventional milking parlour.

⁶¹ Which can also be taken as a signal that cows are unwilling to participate in the practice of dairy farming, or at least not without being rewarded.

especially heifers learn it faster without fences and with enough free space around the robot” (Anton 2010). One farmer says, “I have learned that one has to let the cow be the boss.” Another one states, “You have to give the cows a lot of room and not direct them too much” (Hiemstra 2007). Cows are found to develop ways of planning and arranging their visits to the robots; for instance one farmer’s experience is that “When the cows go out, they first walk to the end of the field, to then gradually graze towards the barn” (Hiemstra 2007).

With a robot, the cows also come to relate differently to their herd. Especially when cows graze on a pasture and need to walk up to hundreds of meters to use the robot, an AMS requires them to unlearn part of their herd mentality. Instead of being fully individualized by the robot, it appeared that once they learned how to milk themselves and got used to the system, they moved from the pasture to the robot in regular groups of a few fellow cows (Heutinck et al. 2004). Some aspects of their herd mentality were found to be more stable, for example one of the basic requirements of motivating the cows to enter the robot was to be in sight of the rest of the herd (Jacobs and Siegford 2012). Some early attempts to build a robot in what used to be the milking parlour did not work out, as the cows would need to walk individually through narrow corridors out of sight of the herd. This was a clear instance of “not thinking from the perspective of the cow and putting her central,” according to one of the AMS research pioneers (De Koning interview 2008).

Other concerns that arose with the first experiences of robotic farming were focused on the new situation’s implications for cow behaviour. As the TA report had already noted, and as Ketelaar-De Lauwere et al. (1996) had also found, access to the robot becomes an occasion and a site to exert dominance, which means, in an AMS operating to its full capacity, that subordinate cows are only able to get access to the robot at (apparently) less favorable hours such as during the night (Hopster et al. 2002). This means that more freedom of cow traffic around the AMS can increase herd processes in which low-ranking cows are kept from visiting the robot, come to a standstill, and wait for the robot for a prolonged time (Wiktorsson and Sorensen 2004; Hermans et al. 2004). (On the website of robot producer Lely this is explained, however, as: “We see that each cow chooses the milking times that suit her best and that fit with the rank order within the herd.”)

This concern over hierarchies and the possibly negative effects of the dynamics within the herd could be said to originate from a view of dairy farming rooted more in individual care systems. However, within the practice of nature management, for

instance, dominance exertion in herds is mostly not considered to be morally problematic. This is in part due to a sense of farmer responsibility to each individual cow, but also because dominance in natural herds has a less detrimental effect on cows as there is more opportunity to flee opponents.

While the concern about animals waiting idly for a prolonged time may arise from its negative effects on animal welfare, or for its suboptimal use of the robot, for dairy farmers it also goes against their sense of optimizing the time budget of cows: in order to maintain their high production level, cows should be “doing something useful,” such as eating, being milked, or resting (Munksgaard and Sondergaard 2004).

Changing farmers

In response to the new character of the cows and farmers’ new relations to the animals, the farmers themselves can be seen to change as well as part of the new system. For them, the transitional period is stressful too, as they need to rearrange their entire farm management to adjust everything to the new system: “The first three weeks were hell, and that’s putting it mildly” (Crowell 2012). The robot requires a new look at cow and herd behaviour in order to accommodate and use these to *fit* with the AMS (e.g. Heutinck et al. 2004).

According to some marketing outlets, the farmer will become a manager (not of employees, but of animals) rather than a craftsman or a stockperson (Van Drie 2005; Van Leeuwen 2012); “This is a completely different life style, now we primarily need to supervise the cows” (Debergh 2005). The ideal, as presented by the robot-manufacturing companies and taken over by researchers, of what it is to be a farmer is shifted in a particular direction. The professional identity of farming is moved away from manual labour and into the office behind a computer, often in a special *skybox*, which is a small, fully windowed office in an elevation in the barn from which the herd can be overlooked.

Several farmers visiting an AMS farm while looking at the robot in action said that they “need to suppress the strong tendency to help out this clumsy looking machine.” The process of attaching the teat cups by the robot, which often takes a few tries as its sensors search for the exact location of the teats, does not look efficient at all when compared to the swiftness with which a farmer would be able to attach them in a conventional milking parlour. In this sense, the farmers experience the need for an almost physical restraint to discipline themselves into a new

understanding of efficiency: not as swiftly attaching the teat cups, but as being elsewhere to do other things. One farmer I visited had fully automated his entire farm, after being relocated, with the latest robotic devices, milking robots, feeding robots, and manure robots, etc. According to him, during the first few days on the new farm he “felt like an intern on my own farm, not knowing what to do myself.” It took a while to learn his new role, and this involved a new self-understanding, as he made clear in his reference to being an ‘intern.’

There is a tradition in the cultural critique and philosophy of technology that stresses the alienating effects of modern technology on its users. Borgmann (2000), for instance, has described how different technological devices can fulfill the same technical function, but do this in ways that make for very different practices in using and maintaining them, which in turn brings very different ways of gathering and socializing those involved in the process (see also Thompson 2000).⁶² The AMS seems to be a clear instance of a loss of both a focal object—the milking parlour—and a focal practice—the milking. With the milking process *commodified* and the cows turned into users, the farmers are made into managers that supervise their animal workers from a computerized office. Borgmann was a student of Heidegger, and it is tempting to consider the automation of farming in more bleak terms. Then the robot can be seen to actively disclose a fully instrumentalized world in which everything and everyone, from the bodies of the cows to the time of the farmer, emerges as mere resources to be efficiently used (Holloway et al. 2013; see also the previous chapter). But things may be more complicated than this dichotomous story of alienation and the decline of meaningful relations.

Deskilling? Disciplining?

As opposed to the common reproach against industrial automation, many of those involved continually stress that the AMS does not function to produce deskilled labour. Whereas in a conventional milking parlour farmers see the cows pass by twice a day during milking, the automated management system produces detailed information on the animals, offering output on parameters such as levels of bacteria in the milk to control and optimize the condition of the cows. Cow health can be monitored to a large extent by means of data generated by the system, in part replacing the human-animal interaction during milking in a conventional system.

⁶² For analogous worries around robotics leading to a diminishing quality of care relations in the sphere of health care, see Wynsberghe (2012).

But as the early experiences with AMS revealed, the skills of farmers in recognizing health problems of the animals are still essential.

Part of the new role of the farmer involves a shift from routine interaction with the cows to a regime of management by exception. A new, specific set of skills is needed to program the robot to create *attention lists* that are adequate, which means having few false negatives or false positives. Apart from milking the cows and registering when each cow made her last visit, the system also detects milk quality deviations, registers the milk volume and body temperature, and tracks instances of disease and fertility (Bieleman 2000). This means the farmer will need to adapt to a different mode of visual control of his cows and to learn to deal with the new management regime (Ouweltjes and Koning 2004). This new task description can be said to require more discipline of the farmer, to make attention lists and follow up on these, or at least a very different type of discipline than that involved in a twice-a-day milking routine. Previously, the self-discipline of being a dairy farmer consisted of getting up early and getting into a flow of watching the cows pass by, a situation in which small differences stand out and the skill is in paying close attention to these. A good *robot farmer* is defined in a different mutually reinforcing combination of skills and discipline. The character of this robot farmer includes the ability to create adequate *attention lists* that are predictive enough to motivate him or her to follow up on them.⁶³ In this way, skill and knowledgeability, both in working with the data generated by the robot and in assessing the condition of the cows, as well as creating adequate attention lists, is closely connected with the self-discipline of following up on these lists and actively taking the time to watch the cows.

A farmer interviewed in a professional magazine stresses that to manage a farm with an AMS “one has to be a cow farmer, not a technology farmer” (Van Drie 2005). Robot farmers tend to stress that one should not “try to manage all the cows from behind the computer only.” With a robot, one has to be in between the cows a lot and keep a close eye on them (Van Drie 2003). Hereby the early experience of the innovators is repeated, together with the idea of different farming styles and associated personal identities. The farmer continues to describe the actual processes of how high-tech systems and information technology are to be integrated

⁶³ This is what farmers using an AMS are often called, as for instance can be seen on web forums and in professional media, for instance Van Drie (2005).

with, rather than be opposed to, the embodied human-animal interaction and skills: “Not just from his office [the farmer] keeps a good overview. When he walks between his cows he at every moment can check on his pocket PC the data of each particular cow” (Van Drie 2005). Other farmers experience a sense of loss, saying, “It is much more hands off. I myself used to try to milk at least once a day. This way it is harder to know your cows more personally. You rely more on computer reports” while the same farmer stated: “It is just a change. You just have to adapt to it” (Youker 2010). Here it seems that co-evolution necessarily means accepting the technological imperative. However, in the process of ongoing adaptation of dairy farming practices, the experiences of meaningful human-animal relations can play a role.

Cow-farmer relations and expectations

The new character of the cow, who no longer associates the farmer with being driven into the milking area, also makes for different human-animal relations. Most cows milked by a robot are said to somehow find out that kicking the robot is not worthwhile, as it is to kick a farmer trying to attach teat cups in a conventional farm: “A cow learns the robot never has bad tempers, and will not respond to any behaviour by the cow.”⁶⁴ One farmer believes that “They’d much rather be milked by a robot than milked by us” (Crowell 2012). Without the farmer coming in twice a day to drive the cows to the milking parlour, the character of the cows is found to change. In the words of one farmer on the public forum of a farming website: “A robot cow is a relaxed, different cow than a traditional one. A robot cow you walk around, you do not push and shove, should mostly treat on the spot and move around as little as possible” (Smink 2006; see also Hopster et al. 2002). A new ideal relation between farmer and cows emerges, in which it becomes a norm to “not disturb the processes in the herd.” At the same time, with a robot, cows need, to some extent, to unlearn to behave as a herd and to function as individuals that decide when it is time to be milked. So the farmer leaves more to herd processes, while the robot changes these.

Especially in the transitional phase of milking with a robot, and with cows out on the pasture, the farmer has to learn not to bring in too quickly those cows that have not presented themselves at the robot after some period of time. This will make the cow

⁶⁴ The fact that cows can tell the difference between a robot and a human being can be considered an interesting contribution to the essentialist vs constructivist dilemma sketched by Risan (2005).

expect that she will be fetched for milking, instead of learning to go on her own initiative. In this situation the farmer needs to develop a management strategy of collecting cows with long milking intervals that fits him or her best: collecting those cows strictly on time may 'save' some milk, but may turn the cows 'lazy' because of their habituation to being collected (e.g. Van der Knaap 2003a).⁶⁵ On the other hand, giving those cows some extra time may 'cost' some milk, but may save the labour of collecting in the long run.

Gaining time or becoming flexible: new meanings of being a family farmer

Is this form of automation part of the ongoing process of increasing scale and reducing the role of humans in farming, eventually doing away with farmers? Or, rather, does it help farmers to improve their labour conditions and lifestyles? Again, these dichotomous positions do not allow for a more subtle assessment of the ensuing implications.

Early on, the robot was promoted as a time-saving device and as a means to allow the farmer to have a social life, doing away with the obligation to milk for several hours a day and to rise early for the morning milking shift. According to one advertisement that depicted men on motorcycles riding against a setting sun, 'they have fun even after the cows come home' (Hogeveen and Meijering 2000, 318).

But the effect on the social life of farmers is not as straightforwardly *liberating* as depicted. Many farmers choose not to switch to automated milking as that would mean losing the rhythm of milking in shifts. And some of the farmers that did switch complain of the new situation in which they need to be on standby for 24 hours a day. With the robot connected to their smart phone, when there is a disruption of the robot they receive an instant message that they need to follow up (e.g. Crowell 2012). With the arrival of the robot, for both the farmer and the cows the ideal of temporal regularity was traded in for flexibility and the opportunity to spread activities freely. In order not to make cows get used to being fetched if they have not visited the robot within the required interval, farmers may collect them at irregular hours, some even at night (Hiemstra 2007).

⁶⁵ For example, according to an anonymous post on a dairy farmers' web forum, an analysis of a farm revealed that: "a robot would generate absolutely no reduction of labour. To the contrary, it generated a stricter planning of activities as with a robot one needs to feed more (to make the cows more active [...]) and you need to walk amidst the cows more often to get the lazy cows to the robot" (Anon. 2008).

For a while, debates have been ongoing about the economic rationale of investing in the automation of milking. With the acquisition of a robot, costing around €100,000,⁶⁶ the cows are no longer the most expensive *capital good* on the farm. To determine its return on investment, a specific perspective on the dairy farm is required. The amount of milk produced is not increased that much by using a robot, therefore most of the justification of the investment is in terms of its labour-saving capacity. So, together with the cows that need to occupy the robot's capacity for the full 24 hours, also the farmer is now on a time budget. The robot is a device that disciplines both farmers and cows in new ways.

Dairy farmers are commonly known as hardworking people who work long hours. "My weekend lasts from Sunday afternoon one to three o'clock" I heard a conventional dairy farmer claim. When they do the milking in the conventional way, it is clear dairy farmers (without employees) need to work seven days a week, and from pre-dawn till dusk. Between the milking shifts of early morning and late afternoon, they prefer to "organize their day spontaneously." With the robot, and (alternatively) with increasing the scale of production due to which farmers can manage larger farms with the help of personnel, the former modes and scale of production however emerge to some as "hidden unemployment."

In the wake of the introduction of milking robots, studies have been produced accounting for the activities of the farmer for each minute of a day (Munksgaard and Sondergaard 2004). The findings of this research varied; as in the description above, it became clear that with the average of three hours spent milking, other tasks, such as checking on the cows and on the robot, became important. According to most studies, it was revealed that besides saving some labour time, it was mostly flexibility that was gained. The desire for flexibility can be found to grow as part of the wider process of increasing scale and the related decline in the number of farmers in local communities: "Nowadays [with only a few farmers left in a village community] social events are often held at 4 o'clock in the afternoon, instead of before when it was common to take the milking schedule into account." Another take on this is: "The younger generation does not want to work for seven days in a week anymore; they want to have time off." Also, in the United States, this can be found to be a motive for robotic dairy farming: "We can go to the kids' functions"

⁶⁶ Which limits the access to this technology, especially in countries where the average dairy herds are far smaller than about 60 lactating cows as is the optimum for robot use.

and “You can work with the cows around your schedule. The cows don’t control us as much now” (Crowell 2012). This type of remark reveals how being a dairy farmer is not always conceived of in terms of a fully asymmetrical power relation in which solely humans are in charge. Rather, with each material arrangement of human-animal relations come different experiences of freedom and being under control, for both farmer and cow. There are other reasons for investing in a robot as well. In any case, it is not necessarily a means to increase the scale of the farm. Rather, it offers an alternative to bringing in labour, as noted earlier. Although hiring an employee to do the milking, even in the Dutch labour market, tends to be cheaper than a robot, a good employee is difficult to find and would require very different management skills, which not all farmers are apt to acquire. Or the robot can be a way of continuing to farm after a certain age at which the manual labour becomes more of a strain, and in the absence of a successor.

It appeared that the desire for flexibility existed especially among younger family farmers. A new situation emerges in which male farmers stay at home and watch over the kids, while their wives can go out to work elsewhere (Van der Knaap 2003b; Mons 2007). In this way, the robot creates a new role within the family for farmers and a new division of domestic tasks. Alternatively, the farmer with a robot can use the time gained to go out and find a part-time job, to take on governing positions in the cooperative organizations which still abound in dairy farming, or to work in education or local politics. Dairy farming with a robot, on the previously normal scale of a herd of 70 cows, is thereby turned into a part-time job.

4.6 Conclusion: ethical assessment as part of co-evolutionary dynamics

Assessing the ethical implications of the introduction of the milking robot appeared to be a complicated matter, as both the farmers and the cows go through a process of change following the introduction of a robot. This does not mean that normative concerns—about what makes a good farmer, a good cow, and a good robot—are not part of the innovation process. This process takes place in a dynamic *moral geography* or *moral economy* in which elements of material practices are continuously adjusted to create what can be experienced as internal coherence. Just as specific cow breeds can be described as the product of a particular normative view of good farming and breeding (Theunissen 2008), so too what is deemed a good robot, or whether a robot is deemed to be good at all, is the product—and the

site—of moral learning and contestation. The outcome of these processes is likely to be not fully determined by inherent characteristics of the technology, but also by other factors such as regional and cultural variation in farming practices, as well as existing moral commitments.

Does a milking robot deskill the farmer? This question can only be answered by considering the new understanding of the skills of robot farmers, which is newly configured with a particular type of (mediated) self-discipline. Does the robot alienate the farmer? This is likewise dependent on other variables: alienated from what—from the cows? *Robot cows* have to some extent become *individuals* and are to be left to *care for themselves* in social processes within the herd while they change in character in the process of adapting to the robot. Is there alienation from the rhythms of communal life? The villages that farmers live in were changing anyway, making the robot a device to regain the possibility of maintaining communal ties. And the robot can bring new relations to work, to the family, and to the outside world. When viewed in this more dynamic practice perspective, deciding on installing a milking robot means deciding what kind of farmer to be, what behaviour of the cows to promote, and what relation between humans and animals to have emerge.

Naturalness is an elusive concept to apply to a dairy farm context (Segerdahl 2007) and thereby also to evaluate AMS with, even though robot marketers tend to claim to have realized a farming practice that reveals the true, natural way of being for a cow (Holloway 2007; Holloway et al. 2013). In fact, the development of the robot revealed that cows do not desire to be milked (by humans or machines, they do seem to desire to have their calves drink when, in rare occasions, given the opportunity to do so). At least they cannot be lured to the robot in due time without a food reward. In debates on animal welfare, the question ‘but what do the cows really want?’ is only answerable by interacting with them. A cow in a tie stall may very well want different things than a cow in loose housing, as they are made to live a different life style, with very different relations with their herd and with humans. In turn, an AMS embodies a different conception of *the good life* (or for some of *the bad life*) for dairy cows. While *individual freedom* was previously never a grave concern regarding the welfare of herd animals, it has become prominent in discussions concerning *robot farms*. The norm of cow freedom promoted by the robot marketers and inscribed in its design became the focus of academic critique, as early AMS setups especially provided freedom for cows but in the obviously restricted form of *forced cow traffic* that was common at the time. But also farmers

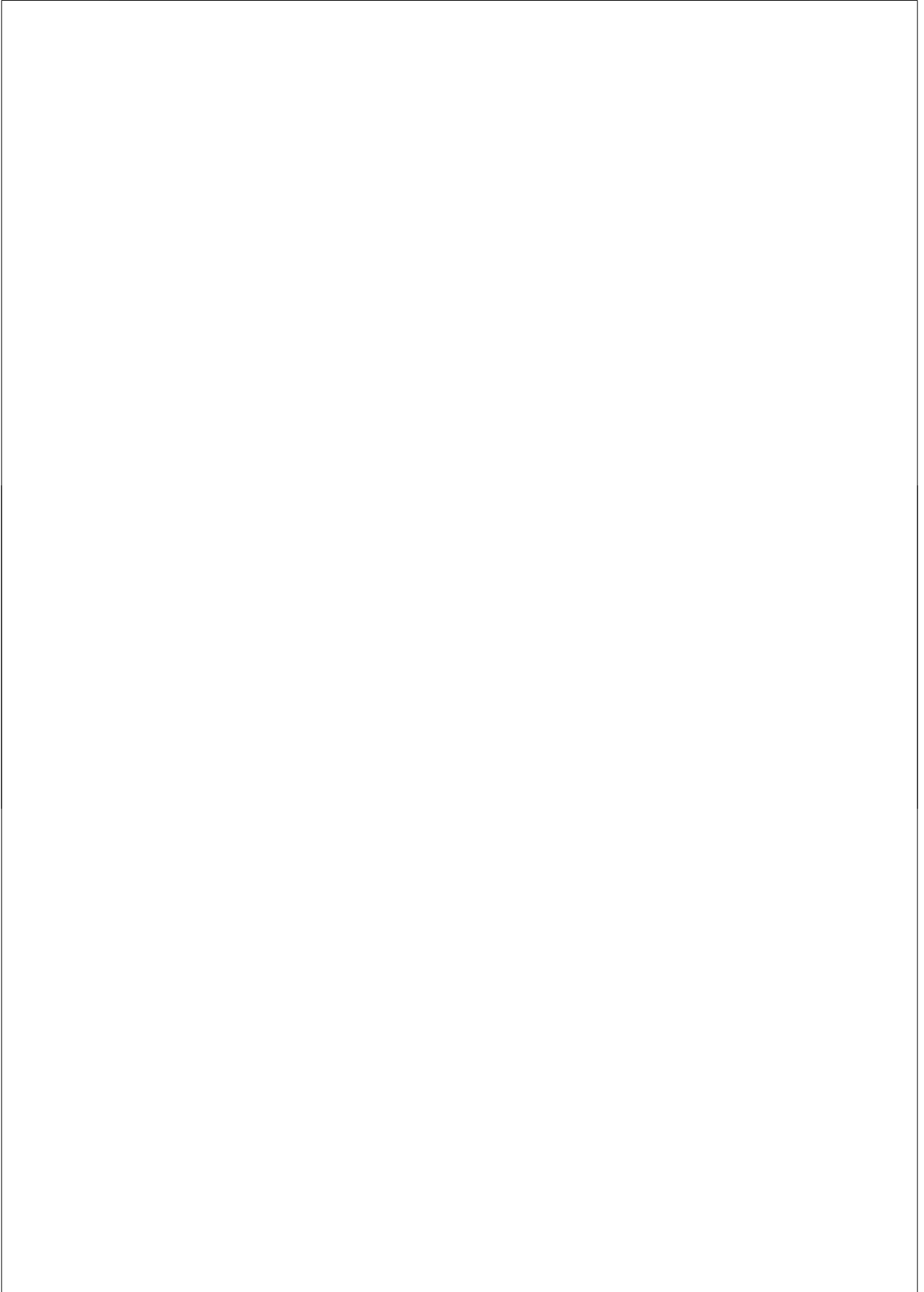
themselves experienced this inconsistency of cows being liberated while forced, and increasingly attempts are being made to provide (what is considered) more true freedom of movement and choice for the cows; as long as they also perform in the desired way, of course. Thereby the co-evolution of ethics and technology is not merely a matter of marketing rhetoric accompanying a new device, but is part of a (to some extent) sincere process of reinterpreting and rearranging practices in the light of emerging norms and behaviours.

We may collectively and universally decide on what type of dairy agriculture would be acceptable and produce the least amount of suffering, on the basis of previous experience of cow behaviour, on what we feel are common sense understandings of appropriate ways of housing cows, and on the basis of scientific studies within a variety of disciplines from physiology to ethology. But leaving it at that could reduce our attentiveness to forms of suffering that would remain and to potential ways of improving systems. What it means to ‘ask the cow’ can be understood as a combination of not only measuring animal science parameters, such as health, heart rate, stress hormones, longevity, and production, but also a prolonged process of human-animal-technology interaction, while experimenting with management and adjusting technological setups. Then the cow and her welfare are considered not as something static that is to be uncovered, but as emergent, together with her new environment. This would mean that an ethical *variable* such as animal welfare cannot be defined only at the species level, say for all cows, so that it can then be fully determined by animal scientists measuring parameters and behaviours of a significant number of representative animals. Instead, the welfare of farmed cows will to some extent depend on the breed characteristics as well as on the abilities, experience, relations, and preferences of individual animals—and the abilities of farmers to adapt to them.

An example of this type of thinking is the “free choice stall” that is experimented with in combination with milking robots by various dairy farmers, in which it is left to the cows themselves to decide whether to go out and graze or remain indoors, e.g. Noordhoff (2009). This is a sign that the norm of ‘cow freedom’ has been taken up by robot farmers, who try to give material shape to it. As can be seen exemplified here, a normative evaluation of something like the AMS can only be understood as part of a wider shift in practices and in terms of an intricate co-evolution process between partly material changes in technological systems and behavioural practices of both farmers and cows in a moral world of shifting ethical norms and changing meanings of normative concepts. The terms in which to evaluate the emerging

practice appear to have changed with the new device: new roles are configured, new experiences are generated, and human-animal relations change in character. And perhaps even the nature of the animals—and humans—involved is altered in the process.

Evaluating new devices such as a milking robot as *objects* with qualities and listing the pros and cons of the innovation is a task with at best only temporary results. But it is one that, nevertheless, if considered as part of a wider dynamic process, can play a role in the ongoing development of technologies and attending practices. This dynamic conception of ethics does not mean we have to succumb to moral relativism. As ethics then is a process of actively engaging with “techno-moral change” (Swierstra et al. 2009), in which practitioners and the general public explore their moral commitments in the light of new experiences: new affective relations with cows and learning new skills in responding to them. In this way, the moral character of innovation processes could play a more prominent and explicitly acknowledged role in the design of new technological systems. This is important in the light not just of the advent of the milking robot, but more widely regarding the rather unquestioned embrace of *smart farming*, in which arrays of sensors and software are projected to optimize farm practices, seemingly without much reflection on the changing roles and experiences of farmers or cows. Ideally these processes of techno-moral change in which farmers are immersed are explicated in public, instigating newly imaginative ways in dealing also with existing welfare concerns in dairy farming: such as the high incidence of udder inflammation (mastitis) and lameness, digestive problems due to a lack of fibrous feed, increasing absence of access to pasture, the early age of culling, calves being separated from their mothers (Ventura et al. 2013) and veal calves reared and transported under harmful conditions (for instance von Keyserlingk et al. 2013). In this chapter, we have seen however that the saliency and meaning of these concerns come out differently when milking with robots than in conventional set-ups. For instance, lameness of cows is more of a problem for the farmer when the cows need to move themselves to a robot. Also, with a robot, allowing for cows to pasture often becomes a practical challenge, but its importance is acknowledged by many farmers as part of the promise of ‘freedom for the cows’ to decide what to do and where to go, not just when to be milked.



**Animal deliberation:
taking animals seriously in political thought and material practice**

“No, freedom was not what I wanted. Only a way out.”
— Kafka, *A Report to an Academy*, 1917

5.1 Introduction⁶⁷

Animals tend to figure in political discourse only in ethical terms, as merely passive recipients of human attention, either for being the receptacles of suffering, or the bearer of rights. Even, or perhaps especially the most radical calls for inclusion of animals in our moral community can be said to do no more than grant animals “the right to remain silent” (Oliver 2009). Representative, rather than participatory democracy is all they can politically achieve; a situation in which the interests of animals are defended on their behalf by social movements calling for their protection and animal scientists reporting on their species specific capacities and needs. Actively involving animals in political processes sounds ridiculous in the dominant traditions of political thought; by definition they have no “voice” and cannot “speak for themselves” (Stuart, Schewe, and Gunderson 2013). And with politics imagined to be necessarily discursive in nature (Tully 2002), we self-evidently define ourselves as the exclusive political animal (Wadiwel 2002). A select few groups of higher mammals may be thought to engage amongst each other in

⁶⁷ A slightly shorter version of this chapter is forthcoming as: Driessen, Clemens. (2014). *Animal Deliberation*. In: M. Wissenburg and D.Schlossberg (ed.), *Animal Politics and Political Animals*. Palgrave Macmillan.

something that we could call politics (De Waal 2007). A wider range of social species even are involved in collective decision making processes that can be seen as democratic and consensus oriented (Conradt and Roper 2007). But even in those instances, their and our politics are usually not deemed to overlap or meaningfully touch upon one another. As long as animals are unable to formally address us as fellow citizens, there seems to be no need to interpret and reconstruct their individual desires, to respond to their particular behaviours and to take their agency seriously.

This chapter argues instead for an appreciation of active animal politics. Even stronger, it proposes to understand the political agency of animals not merely as resisting (Hribal and Clair 2011), or bargaining and negotiating (Donaldson and Kymlicka 2011), but as contributing to ‘deliberation’: political communication within an ongoing collective process of decision making in which at the same time political subjectivities of both humans and animals emerge and are delineated. This is not (directly) a call for somehow granting certain formal political rights to animals –the right to convene, to vote, to be elected– which would create havoc in our solemn political institutions. Instead, this is an argument starting from an empirical claim, on how in numerous practices animals in effect play a prominent role and are to some extent already taken seriously in ways that could be interpreted as political. By recognizing the inherent ambiguity in our dealings with animals, and in theirs with us, we can experience a call for an inquisitive, experimental, ongoing politics of everyday animal encounters.⁶⁸ The aim of this political stance is to develop a sensibility for interpreting intricate non-human behaviours, and a willingness to experiment with alternative open-ended situations in which animals may reveal new (or previously unnoticed) abilities and desires. Therefore, rather than right-away formalizing animal rights in our legal constitution, this is a call to recognize how animals have always been political.

These types of processes, in which animals can be and are understood as political subjects behaving in politically relevant ways –as idiosyncratic beings engaged in a shared learning process– can for instance be discerned in nature conservation practices in which humans and animals learn to live together (Whatmore 2002;

⁶⁸ This political process is somewhat akin to animal science research into the (revealed) preferences of animals (Fraser and Matthews 1997; Dawkins 2003). Though this type of preference testing can be criticized for offering a limited set of options to the experimental subjects, whose preferences may depend on their past experiences (Haynes 2008).

Hinchliffe et al. 2005). But the implicit presence of animal political subjectivity is especially salient when animals are involved in developing new technologies, as I will argue in this chapter.

The technological systems that surround us are thoroughly political in character: not merely by providing means to ends upon which we decide, but in much more subtle ways they occasion moral debate and are the site of political contestation (Keulartz et al. 2004). Bruno Latour has elaborated the political character of our dealings with the natural world, stressing how controversial technologies are occasions for the emergence of particular publics (Latour 2005) and emphasizing the ways in which we are continually involved in societal experiments (Latour 2004). Although Latour has been controversial for envisioning politics beyond the human sphere and for assigning moral agency to non-humans, his work has featured few technologies that have animal users.⁶⁹ With one notable exception: the cat flap.

5.2 Cats and doors: animal politics by design

In a short paper, Latour has discussed the cartoon figure Gaston Lagaffe as a philosopher of technology (Latour 1995). The obstinate handyman Gaston, jack-of-all-trades with a cartoon publisher, manages in a process of negotiation and learning to redesign a door in his office in such a way that it achieves the functionality desired by a variety of characters. Prunelle, Gaston's boss, wants to keep the door shut to prevent a draft, but complains of continuously having to open the door for the meowing office cat. To solve this, Gaston decides to put a cat flap in the door. For Prunelle, this means the door has been damaged. Nevertheless, it does meet the initial requirements of both cat and boss: for one it is an opening, for the other a closed door. Then, however, a new character appears. The office seagull has become jealous (as interpreted by Gaston) of the cat that can move freely through the closed door. This demand can be met as well by material intervention, as Gaston invents a seagull door-opening.

⁶⁹ Numerous others in science and technology studies and associated fields such as (more-than-human) geography and anthropology of course did, most notably Haraway (2008) and Whatmore (2002), who inform the rest of the chapter.

Latour's point with this example is that the story of the door and its users cannot be understood merely in terms of office power relations, nor only as the functional evolution of a door. The story is only meaningful if you trace the changes in actors and doors together, and interpret their characteristics and meanings from each perspective. By reinterpreting and redefining the practical meaning of a door, Gaston is involved in a collective learning process in which new subjectivities emerge and the legitimacy of their claims and desires are explored in interaction, by tinkering with their shared material conditions. The outcome of this socio-material process of deliberation is not necessarily a formal consensus. This is exemplified by Prunelle, the boss who by the end of the tale has lost his ability to voice his concerns in reasonable language: "RÂÂAH!!!" is all he exclaims.

Jenny Diski has recounted a similar experience with her cat, emphasizing the ambiguity of interpreting animal desires. After putting a catflap in the door to her study just as the one in her kitchen, her cat refused to use it, demanding instead to be let in 'in the human way' (Diski 2011). While she first thought she was engaged in a clear-cut negotiation over the functionality of the door to her study, the material intervention and subsequent behaviour revealed that in fact a different process was going on. One in which not only their interests and desires, but also (both their understanding of) the nature of the (power) relation between the cat and her was at stake, as well as the meaning of freedom and independence.

As opposed to the liberating cat flap, Clare Palmer (1997) has drawn attention to an alternative set of technologies that combine into an oppressive regime under which cats are bred, disciplined, castrated, and made to accord to our image of what a cat should be. In her (early) Foucauldian take on cats, she describes domestication and breeding as a matter of supervision, surveillance and discipline, and eventually as reducing the capability for resistance and "physiologically internalizing" a regime of human dominance. Her critique of the fully subordinated life-form of some domesticated animals does indicate a problem for deliberating with them: should we see all animal behaviour as authentic expression of their desires and interests? Some may dismiss the agency of domesticated animals as if by definition merely the product of their 'false consciousness' produced through taming, domestication, breeding and confinement, whereby only species-specific behavioural patterns which have analogues in the wild are to be taken seriously.

Evidently, acknowledging animal agency in practices of animal use entails the danger of making animals complicit in their own exploitation and legitimizing their

suffering as somehow self-chosen, perhaps even in terms of a kind of “social contract” (Palmer 1997). Balancing this danger with the opportunity to take the animals amongst us seriously as political agents is the challenge of deliberative forms of living together. Animal deliberation would be an alternative to both the notion of “benevolent domination” that is implicit in much animal welfare discourse (Cole 2011); But also to the idea that domesticated animals by their nature are purely a victim of human oppression and exploitation only, completely passive “moral patients” (Regan 2004, 154), at best recipients of human benevolence or justice. The deliberative stance however would in principle not exclude the conclusion that certain practices are to be amended or even discontinued, for instance those that disallow the flourishing of animals to such an extent that they are unable to engage in common non-discursive articulation of their preferences.

5.3 Deliberating in the field: making a mobile milking robot

It is not just pets that in practice partake in situated and material modes of deliberative interaction. Here we return to the milking robot, this time as an example of forms of animal deliberation that became especially salient when a group of farmers and technologists started to take things into their own hands. The introduction of milking robots by which cows are automatically milked without farmer supervision required a similar mutual learning process as described around cat flaps. As we saw in the previous chapter (Driessen and Heutinck 2014), learning to deal with a robot involved changing notions of what makes a good cow, a good farmer and their appropriate relation.

Continually, the character of the cows was subject to interpretation by the farmer: whether they are genetically ‘lazy’ or do not receive the right feed, whether they are too stubborn or not intelligent enough to enter the robot, or whether they dislike being forced to it and rather decide for themselves when to enter. The farmers investigated whether the robot turns low ranking cows into victims of dominant bullies, or whether this could be prevented by rearranging the layout of the system. And the newly created *free choice* set ups revealed that some cows prefer to remain indoors, leaving the farmers wondering if thereby these cows revealed to be thoroughly alienated and not natural (enough) anymore.

Besides questioning the liberating character of this new technology as merely fostering one particular form of productive bovine subjectivity (Holloway 2007), meanwhile another more obvious problem for cow liberation had started to appear. In practice it was often found to be difficult to combine pasturing with continued access to the robot. This created the paradoxical situation that installing a milking robot was said to afford freedom to the cows, but only by locking them up in the barn all year round. Especially in the Netherlands, where pastures populated by dairy cows are the iconic national landscape, the proliferation of empty fields is considered problematic. A problem exacerbated by the norm of 'cow freedom' that comes with the robots.

To deal with this concern, a group of Dutch farmers, researchers and technologists started experimenting in 2007 with a mobile milking robot, to be operated with the cows on pasture.⁷⁰ Again, a seemingly simple adjustment of a technology entailed a series of further issues. Numerous technical challenges in making this new device work and having the cows perform productively⁷¹ were mixed with what in ethical theorizing would be considered *conceptual* questions: on the centrality and appropriate meanings of naturalness, freedom, voluntariness, and farmer responsibility. These were not taken up as questions to be answered purely or primarily on a discursive level. Various practical meanings of these notions were experimented with by creating new material arrangements and watching the subsequent behaviour of the cows.

Steering the cows?

Several ICT systems have come on the market over the last decade to aid in the management of dairy cows. Step counting devices are already quite common, allowing the farmer to detect lameness and infer whether cows are fertile and biologically ready for insemination. More recently a device has been developed called the 'SensOor', that is to be attached to the ear of the cow, which measures in real time a number of bodily parameters such as temperature, breathing, and

⁷⁰ Over the course of 3 years, between 2008 and 2010, I joined a series of meetings of the group. Their trials involved primarily the study of the technical functioning of the system and whether and how the animals manage to get used to the "machine-animal interactions" in the light of pasturing regimes, differences in weather and the location and movement of the robot (Houwelingen et al. 2009).

⁷¹ Such as how to prevent the cows from damaging the grass at the exit, how to make sure their feed intake is adequate and how to make them milk themselves within the appropriate time frame.

ruminating frequency, transmitting these to the central farm computer.⁷² Within the mobile robot network someone proposed to use this kind of device to direct cow behaviour, by having it make a beeping sound into the cow's ear, or perhaps by administering a small electric shock, when it is time to move to the robot.⁷³ Farmers in the pasture robot network discussing this idea were divided, but on the main sceptical regarding the desirability of this type of application. Most were not sure whether the beeping, and especially the shock, would be an appropriate expression of the norm of voluntariness they deemed important. The alternative of using 'music' already sounded much friendlier, but still some unease remained with most of the participants. While the device may work as a form of operant conditioning, training the animals to avoid receiving beeps or shocks, the intuitions of most of the farmers, based on lifelong experience in relating to cows, made them reluctant to accept this type of steering of behaviour. Even though some argued there was in principle not a big difference with electric fencing, or even barbed wire, and that especially the beeping device may have advantages also for the cows.

The reluctance of the farmers might be explained by it being an arrangement offering too much control on the part of the farmer and the system, and too little initiative and decision making on the part of the cow. This would not amount to an appropriate form of interspecies communication understood to require more subtle forms of seducing animals to cooperate and more mutual and symmetrical forms of influencing and learning. Or, the cows would have to be granted behavioural opportunities to somehow communicate their *voluntary* compliance with or resistance to the emerging new system (cf. Coppin 2003). Farmers seemed aware of a danger of 'turning cows into objects' and were committed to creating a practice in which some positive form of subjectivity, understood in terms of naturalness and voluntariness, would be allowed to emerge.⁷⁴ For the farmers it is obvious their practice is a hybrid of technology and nature. Still, however, they seem to experience the notion of naturalness to be meaningful in discussions. Ideas of *true*

⁷² See for instance: Agis Automatisering BV (2014)

⁷³ See also: Wredle, Munksgaard, and Sporndly (2006). This type of system could even be deployed to do away with fences altogether: with a GPS, the device could be made to stop the cow when she crosses a preprogrammed line in the landscape, in a way similar to 'shock collars', by which feral wolves are being kept out of farming areas in parts of the United States.

⁷⁴ Hesitations regarding this type of behavioural control, as sticks instead of carrots, could be understood in terms of the Foucauldian distinction between the more obtrusively forcing and controlling mode of sovereign power in contrast to more intricate forms of biopower working via internalizing norms and aimed at (also) the wellbeing of populations and the individual subjects of power (Foucault 1998; Srinivasan 2012; Curran 2001).

bovine behaviour and lifeforms played a role in the discussions, such as living with calves, with a bull, and calving in spring, without necessarily denoting some (agreed upon) essence of what a cow should be, or necessarily the releasing of a pre-existing subjectivity.

The process of *bricolage*⁷⁵ by farmers and technologists to re-cohere their practices in new ways around the new system under development was not a one sided affair. The ensuing back-and-forth, of tentatively changing elements in the farm system and observing the response of the animals, can be considered to form a dialogue between farmers and cows, with the robot, the feed, the pasture, and the management of the system as media of communication. This is not merely a material 'dialectic' of adaptations, but an actual ongoing dialogue, in which animals may refuse to cooperate, or even can be found to 'propose' alternative modes of living and relating. One potential new mode of dairy farming that emerged from this was to deploy the robot in nature reserves, which the farmers gradually realized would entail a very different type of management regime and more robust cow breed.

5.4 Political animals in theory

Could cats and cows then be considered *political animals* in the fullest sense? Clearly, for Aristotle they, like women, slaves, foreigners and craftsmen, would not qualify for the circle of rational citizens gathering to discuss the affairs of the polis. Since then, "the tradition of politics itself, at least in the West [...] has, by and large, exempted the non-human animal from agency as a political being" (Wadiwel 2002). Should this situation for animals be corrected and our political community be expanded to include (some) animals? According to Donaldson and Kymlicka, the sheer presence of animals in the public realm can already serve as a catalyst for political deliberation, altering attitudes, and changing the terms of political debate (Donaldson and Kymlicka 2011, 114). But beyond that, animals –some more than others– can even have political agency. They can express preferences when provided with a range of non-coercive alternatives, for instance by "voting with their feet" (2011, 66). And they can be found to protest and dissent, such as by

⁷⁵ A process conceived as involving non-human inputs, to be distinguished from modern, top down forms of 'engineering' (Fuller 2012).

refusing to cooperate in the ways envisaged by their human keepers (2011, 115). Donaldson & Kymlicka argue that if we start from the premise that individual animals lack agency by which they express their subjective good, we are bound to ignore their “vast repertoire of vocalizations, gestures, movements and signals” (2011, 109). In an understanding of moral action not as emanating from commitment to abstract justification, but in (equally complex) terms of character and motivations such as love, compassion, fear and loyalty (2011, 116), animals are more than moral patients. This implies a shift from a focus primarily on the institutionalization of legal rights for animals, towards nurturing multispecies communities in which humans learn to be responsive to those they in various ways share their world with.

Donaldson and Kymlicka and others (Plumwood 1995; Hobson 2007) have drawn attention to how very artificial it is to separate out all non-humans from our notions of community and (political) agency. We live in communal relations of interdependence and reciprocity with an abundance of (more or less domesticated) animals. This interdependence is something we continually adjust, interpret, re-cohere and wonder about. In the process, animals are not merely passive receptacles of our projections and desires. For many, various animals in fact bring a sense that there is something not only agential but subjective, inherently meaningful in how they respond to us and their changing habitats. Non-human animals thus in many situations already engage in deliberation with humans.

Deliberative democracy coming of age

Instead of envisioning politics as the mere aggregation of individual preferences and democracy as a matter of voting and majority rule, political decisions within the deliberative ideal are to be made in a process of public discussion, reasoning and judgment (Bohman 1998). Only the ‘force of the better argument’ was to play a role in collective decision making, aimed at a reasonable consensus among all those involved. This high minded ideal form of politics may seem too much to ask for animals to contribute to. But over the past decades theorists of deliberative democracy have come to believe it was unduly demanding already for humans.

The deliberative ideal formulated in terms of (impartial forms of) reasoning has been found to exclude those that are deemed not reasonable. And it can be considered to be too demanding with regard to what counts as an argument: “It favours the educated and the dispassionate and excludes the many ways that many people communicate reasons outside of argumentation and formal debate, such as

testimony, rhetoric, symbolic disruptions, story-telling and cultural- and gender-specific styles of communication” (Bohman 1998, 410). To this favouritism we may add ‘species-specific’ styles of communication (see for example Eckersley 1999). The central distinctions defining legitimate deliberation, such as the reasonableness or unreasonableness of participants and their positions, can be considered –in a conception of deliberation as a matter of situated practices– to be best (if not exclusively) made as part of the deliberative process itself. The political subject as understood in theories of deliberative democracy is (open to be) transformed in the process of deliberation (Cooke 2000, 948). No longer is deliberative democracy then thought of as the (Habermasian) ideal, impartial and power-free antithesis to bargaining and voting, but as an ongoing attempt to find practical ways for making political processes more deliberative, stressing the importance of reasoned argument (in whatever form) and free and open discourse (in whatever space).

That *deliberation* is not a wildly outrageous label to put on interactions between animals and humans can be argued for in the light of more realistic and environmentally attuned views of deliberation developed over the past decades. Dryzek, for instance, has called for ‘deliberating with non-humans’ from a concern of how to incorporate environmental issues in our political communication. He proposes to extend our deliberations to communicate with the non-human world, and for “openness to non-human signals” in socio-ecological systems, especially in the face of (large scale) environmental problems (Dryzek 1995). He recommends to include feedback mechanisms of natural systems as meaningful communication on environmental concerns (Dryzek 1987, 207). Instead of leaving things to an elite of scientific experts, Dryzek stresses the importance of maintaining a variety of discourses on an issue. For him and other discourse theorists however, “assertions will only have value in the discourse when expressed as language” (see Whitworth 2000). And he believes deliberating with non-humans is best done by (self appointed) advocates interpreting the needs of the environment and nature – thereby (arguably) departing from the ethos of deliberative democracy that idealizes participation and direct communication.⁷⁶ His position is somewhat ambiguous though, as Dryzek has also critiqued Habermas for considering only discursive exchanges between humans as political communication, and called to expand our understanding of rationality to include immersion in and interaction

⁷⁶ For a discussion of the problem of how to include and represent ‘nature’ in deliberative democracy, see also Eckersley (1995; 1999).

with the natural world (Dryzek 2008). This opens up the idea of a deliberating subject as not exclusively human, nor solely based on human features that in some lesser form might be present in particular elite species of animals, such as primates. Recognizing this type of political subjectivities involves seeing deliberations to occur at unexpected sites, as part of forms of interaction that are often not formally considered political in nature (Held 2006, 215). To understand the political character of these subjects we can turn to work in science and technology studies focusing on the politics of materially mediated interactions.

Everyday material politics

A constructivist approach to the *politics of nature* (Latour 2007) does not aim at univocally representing nature before making political decisions, but thinks politics in terms of creating communicative situations with an experimental character in which the interpretation of nature and its constituents is an ongoing affair. Within these processes of transformation,⁷⁷ material aspects and conceptual understandings are subject to continuous fine-tuning and tinkering (Korthals 2004, 78). In an object oriented view of politics that zooms in on the material character of communication and shared life, particular features of what can be called political come into focus. Law and Mol have argued in relation to this situated form of politics for an understanding of ‘the good’ not in a utopian sense as single and purified, but as entangled, to be dealt with in complex, mundane, material practices. There, “‘the good’ figures as something to tinker towards – silently”⁷⁸ (Law and Mol 2002). Objects enable involvement and thereby can be part of resituating subjects in “a socially, materially, technically, emotionally, aesthetically ‘thicker’ world [...] in which technologies make a difference to the modes and forms of their involvement” (Marres 2009, 124). Appreciating these material modes of public participation opens up politics to include non-linguistic interactions; Something that fits in well with a deliberative style of politics which is grounded in experience and promotes local knowledge and tacit ways of relating to others, rather than requiring detached and impartial styles of argumentation (Tully 2002; Young 2011). Instead of only occurring as part of institutionalized and formalized settings, more mundane and non-discursive forms of deliberation can be part of material political processes too,

⁷⁷ There is, of course, the danger of merely adjusting the animal to a material setting geared towards narrow human interests, such as making ‘mindless chickens’ (Bovenkerk, Brom, and Van Den Bergh 2002) that no longer can engage in mutual learning and deliberation.

⁷⁸ Though not necessarily in silence, why not tinker amidst the chattering of birds and the mooing of cows?

at least when participants engage in communicative action oriented to understand the positions of others and building trust, aiming to arrive at some form of consensus, or at least cohabitation, rather than engage in antagonistic struggle.

Animal communication

Could this type of ongoing interaction via changing circumstances and (indirect) responses be considered to be genuine political deliberation? Would there be room for the exchange of actual political positions or arguments in non-discursive forms of *material politics* (Law and Mol 2008)? There is a tendency to envision a continuum, or in fact a hierarchy, of forms of communication which at some point may be called political, and at the very pinnacle would amount to democratic deliberation. Claiming interspecies interaction to be in that ultimate *deliberative* category may seem nonsensical. The material mode of interacting proposed in this chapter should however not be seen as a matter of high-minded humans stepping to the base material level of animal communication that is self-evidently 'lesser' than the eloquence of human utterings. We are only beginning to fathom the moral and political meaning of the fact that many animals are more sensitive to a range of subtle signals sent out by humans than even these humans themselves realize (see for example Despret 2004; Smuts 2001). Work in *zoosemiotics* and other maverick forms of ethology that allow for the active presence of human observers are generating an understanding of the natural world as brimming with (potential) interspecies communications (Lestel, Brunois, and Gaunet 2006). How strange it would be to remain politically deaf to this humming of life, to define humans as outside of this ecological exchange of signals – seeing these as just a matter for ecologists and economists, to establish the value of the ecosystem services they provide to us. Instead, we could experiment with trans-species learning processes which may generate forms of mutual adjustment and even understanding (Meijer 2013).

5.5 Deliberating on a par

Animal deliberation is not just to be understood as (over-) extending our willingness to take seriously somehow 'defective' human speakers, in a latest overly generous widening of our political circle with not-quite-up-to-par political subjects. Extending the space of deliberation to include animals could also be a way to question the dream of disembodied reason, clarity of self expression, and the

individual ability to autonomously partake in lofty reasoned debate that leads to sensible collective decisions (see Hobson 2009, 67; Wolfe 2010, 99).

Do animals need to justify their views in order to properly engage in debates? Justification could be thought of as generalizing one's position beyond a mere expression of personal desires. When justification not necessarily requires laboriously phrased abstract principles meant as ultimate foundation for a particular political position, animals might get further than one perhaps expects. Animal behaviour on occasion can be understood as proposals for alternative modes of shared living. Their alternation of compliance and resistance is now often ignored. We tend to see technological systems that subsume animals as normally functioning smoothly, only interrupted by occasional nuisance when the animals fail to perform as scripted in the infrastructures we created for them. Instead, this alternation can also be something we may learn to appreciate as meaningful signals, thereby becoming *response-able* (Haraway 2008). Rather than trying to make nature or animals speak, we may seek to increase our receptivity. When humans interpret non-human signals as mere 'information' to be used solely for their own purposes of domination and control, it is humans who fail to be deliberative, not animals. Hribal and Clair (2011) have for instance described how repeated and increasingly elaborate escapes of Orang-utans are consistently framed as conscious acts of resistance and expressions of discontent by zoo keepers, who nevertheless mostly respond by disrupting orang-utan communities and heightening security measures; This is a clear instance of animals engaging in political deliberation and humans refusing to acknowledge their behavioural expressions as meaningful communication on the (possibility of a) good life in captivity.

Deliberative politics is attentive to the quality of communication. If animals are ignored because of a purported inability to communicate in ways that humans feel comfortable with, this can just as well be seen as a human lack of being a fully deliberative member of a more encompassing political community. This common failure is due in part to a political vocabulary that stops short at animals, thus an issue of political recognition. If we can only think of human-animal relations in terms of human interests, occasionally curtailed by animal ethics, then we fail to acknowledge how we often already experience animals as putting forward more particular substantive claims. Animals have historically been much more influential in bringing forth our world; As Kersty Hobson has argued:

“Animals here are not simply mapped onto the pre-existing human world or are dumb actors in diverse polities. Instead, their representations and physical presence co-creates the histories, moralities, political subjectivities and places we take as natural and/or devised through human ingenuity alone” (Hobson 2007, 257).

The political agency of dairy cows may seem to be nothing but docile ‘willingness’ to daily produce incredibly large offerings of milk. But they still communicate, if we are willing to listen. The woeful mooing of a cow when her newborn calf is taken away has led to a practice of separating them early to prevent bonding. Some dairy farmers however experience it as a moral call to try and find alternative ways of running the farm, such as by using ‘foster mothers’ or experimenting with a ‘family herd’. In this way, the practice of dairy farming involves an ongoing process of delineating the true and legitimate desires of cows from what farmers perceive as undue aberrations of what a good cow is and what it means for her to lead a good life. When the group of farmers first rode their mobile milking robot outside to be operated with the cows on pasture, this led to a reinterpretation of previous behaviour of the cows: “As long as the robot had been in the barn, cows had often been milling around the robot, even vandalizing it. But as soon as the robot went outside with them, they did not bother to go to it except for making an actual visit.” This farmer concluded that what was considered ‘vandalism’ in the barn, in hindsight appeared as a legitimate expression of boredom and dissatisfaction with the housing conditions.

Commonly we start to look at the political by defining it as exclusively human, based on some particular mental feature as the core of our exclusive political animality: us as the sole meaning making, reflective, argument providing, rights granting, reasoning, rational animal. But demarcating our political community in this way would hamper the practical acknowledgement of meaningful communication on the lives we share with non-human subjects. There are differences between humans and the variety of other animals on earth. But for a broadened understanding of politics it is important not to assume a particular defining difference that should guide all our interpretations of the status of their communicative behaviour. This also means there is no clear cut-off point of the kinds of organisms that we could deliberate

with, opening the door to beings that are not self evidently 'sentient' or 'subjects-of-a-life'.⁷⁹

So this poststructuralist (Foucault), constructivist (Latour) and posthumanist (Haraway, Whatmore, Wolfe) version of deliberative democracy does not assume pre-given, autonomous human or animal individuals freely joining in reasoned debate, but sees these figures as relational outcomes of processes of deliberation. In processes of multispecies tinkering, what counts as a legitimate 'position' or 'argument' is an emergent part of the ongoing processes of material and practical change. A good cow and a good farmer continuously sorted themselves and each other out and were interpreted based on their behaviours, skills, production, and sometimes affective interaction. What gives the interactive *bricolage* between farmers and cows a dialogical or even deliberative character is the way their identities, interests, and desires are not static input to the process, as in bargaining or negotiation, but are themselves open for revision and at stake in the process. Taking seriously the responses of animals to tentative changes in the systems and infrastructures in which they live, accords with a deliberative understanding of democracy in which the source of legitimacy is not the predetermined will of individuals but their process of formation (Held 2006; Manin 1987). When the transformative nature of deliberative processes involves not just changing preferences of free, equal and deliberative citizens, but extends to what it means to be a deliberating subject, then also what amounts to deliberation should not be (narrowly) defined in advance.

For animals, it would perhaps be farfetched to try to institutionalize deliberative democracy in formal procedures. In a sense, those whom it concerns are already included in the process of adjusting for instance the dairy farming practice when cows influence its redesign. Apart of course from those cows that refused to adapt to the robot: being culled is not a very legitimate way of dealing with political dissidents. It is uncertain whether the cows 'know' they are deliberating with farmers and robots, that they have not only the bargaining power of (collectively) refusing to present themselves to the robot –as some dairy herds have successfully done– but even some moral or political standing; that they have the power to

⁷⁹ This openness to what is ascribed value and what to attune to as partners in political communication also holds the promise of a more fine-grained and inquisitive approach to the exaggerated opposition between animal and environmental ethics.

'address' issues of justice through a general claim regarding appropriate care. For dairy cows it is difficult to aim for political freedom in the full common meaning in the political domain; cows are on the farm basically to work, not to flourish as free and equal citizens enjoying guaranteed basic liberties.⁸⁰

Is it deliberation to the farmers? It can be argued that farmers are after a form of intersubjective legitimacy which to some extent they seek in their interactions with animals. The interaction between cows and farmers makes it more than a matter of decision making based on moral obligations. The redefined farming practice is the outcome of what they may experience as an honest and therefore legitimate process; a process that ideally –especially when installing new technologies– is creative, open, imaginative, and allows the animals to reveal (and learn to develop) their desires, and their individuality or communality; such as when expressing boredom through vandalism.

The appeal of animal deliberation

Deliberation is not (just) a way of arriving at decisions, but also a collective mode of "truth making", which involves mutual learning and (contestation between) multiple sources of expertise (van Oudheusden 2014). For example in experimental approaches to nature conservation, the forms of expertise that are actively sought are not exclusively human, but involve active learning processes of non-human individuals and collectives (Lorimer and Driessen 2014). A dairy farm too is clearly managed with knowledge that is distributed over farmers and cows, and interwoven with the material arrangement of the farm.

As in the case of the cat flap however, rearranging the material culture we share with animal others is not just a communal pursuit of the good life. It can involve power struggles and inequalities. But a deliberative view of interspecies political exchange would prevent us from seeing only a zero-sum game type of clash between the interests of humans and animals. Since processes of deliberation have "community-generating power" (Cooke 2000, 949), animal deliberation would contribute to bringing about a multispecies community. In these, deliberating animals are more than passive sites of welfare or suffering. They emerge as creative, expressive beings who can be heard having a claim on us, to rethink our position as political subjects and change our ways. The call for animal deliberation however

⁸⁰ Though for a conception of flourishing dairy cow citizens, see Donaldson and Kymlicka (2011, 139).

involves not so much a moral duty of going against our private interests. Instead, this is a mode of encountering non-human others that can be inherently appealing, intrinsically rewarding and a meaningful experience of becoming a subject in an extended political community. It is not based on an abstract appeal to non-human rights, but springs from a notion that learning to attune to minded others who are abundantly present among us will make for more interesting and thoughtful forms of democracy and environmentalism. In many ways, animal deliberation can even be motivated by anthropocentric concerns: learning to share the planet with animals – in the wild, the home, and perhaps on the farm– will be instrumental in our species survival as well.

Intermezzo

**A philosopher in the mobile robot farmers' network
– a visual intervention**

Over the course of 3 years, between 2008 and 2010, I joined a series of meetings of the group of farmers, technologists and researchers who gathered to discuss the development of a mobile robot to be used on pasture. The prototype mobile milking robot, branded *Natureluur* (a name carefully crafted by the designers to indicate naturalness), has been used in trials on several experimental farms in different parts of the Netherlands. This prototype was assembled from a common (Delaval) milking robot mounted on the base of a 'crawler dumper' vehicle, together with a container with all the necessary equipment including a management computer that collects the operational data from the robot and sends this to the farm house. The vehicle was self powered, but a diesel aggregate was added to power the robot in order to keep fuel use low and reduce the noise of the system. Via a small step the cows can walk into the space for being milked on the backside of the vehicle, in which the robotic milking operates in the same way as in indoor systems. Once every two days, the robot is moved to the farmhouse to unload the milk and reload supplies of water, diesel, udder cleaning fluid and feed concentrate (Zevenbergen 2007)

The various farmers involved in the network had different motives for contemplating a mobile robot: Several wanted to pasture cows in fields further away from their barn, or had their land dissected by a road preventing the cows from going to the robot themselves.⁸¹ Another wanted to milk his 'organic but highly productive' cows that he had grazing in (semi-natural) landscapes in river

⁸¹ A few years ago, a farmer has solved this issue by creating a road crossing for cows modelled on those for trains. The cows themselves are granted the opportunity to decide when they want to cross the street, making car drivers wait for them to cross over (ANP 2011).

floodplains nearby. Still another, more large scale farmer, was thinking of new concepts for housing cows, and since to build housing is expensive he was interested in how the mobile robot could function as an alternative to a barn. The agro-technologist that created the prototype planned to eventually milk cows in nature reserves that are managed by the Dutch state forestry (*Staatsbosbeheer*). And an experimental farmer was searching for ways to manage a large scale farm within a 'small scale landscape' in which the farm he was running was situated.⁸²

Each of the participants was looking for a new farming style that fitted with their local circumstances and personal ideals, whereby the potential of a mobile robot could help unfold new possibilities (cf. Van der Ploeg 2003). While discussing the early experiences with the prototype and possibilities on their own farm, the farmers were designing a shifting practice from elements that were to be rendered coherent. Setting up and maintaining these new practices, we saw in the previous two chapters, can be understood as a material-ethical learning process, in which the demands of the new situation and the understanding of these demands are reflexively taken up in the management and redesign of the system and its various elements. This process was found to include giving material shape to notions of responsibility, voluntariness and care (cf. Mol, Moser, and Pols 2010).

After a few months of testing with cows in a field, the mobile robot was trucked to a different region, from Zuid-Holland to Friesland, for public demonstration. Its bovine users were moved along, as it would be difficult to make a new herd accustomed to being automatically milked in the field. The cows allegedly left the truck and entered their new surroundings somewhat hesitant, but "as soon as the cows recognized the robot, they just resumed their previous ways again." For one farmer, the mobile robot made him contemplate whether "the robot could be the leader cow of the herd," with the robot 'deciding' where to move next on the pasture and the cows following suit. Another member of the network would aim for "the robot and the herd to become a unity, and therefore a collective stress free movement; each interference of the farmer would be too much." And another thought of the pasture robot to produce a "natural calm" within the herd. These were clear instances of the subjectivities of both cows and farmers being actively envisioned to emerge from the material practices in which they are intertwined.

⁸² This would amount to a farm with multiple herds on various pastures in a wide area around it. Such a configuration would open up the whole notion of 'large scale' and 'small scale' –as question of herd size rather than amount of animals owned- and thereby add a new angle to the debate on the increasing scale of farming.

Milking in nature reserves as a hybrid animal practice

With a fully operational movable robot, the possibility would arise of milking cows in natural areas or even nature reserves. Transcending the opposition between farmers and nature conservationists, the 200.000 hectares of nature area in the Netherlands could then be considered as potential land for new forms of agricultural production, where the dairy cows with their mobile robot perform the ecological function for which currently de-domesticated large herbivores are deployed⁸³ (Van der Hulst 2007). Hereby a vision of dairy farming is put forward that is situated in-between the intensive practice of animal husbandry and forms of nature management. This newly explored combination of what are normally considered adverse *animal practices* (Korthals 2004) or competing forms of *bovine biopolitics* (Lorimer and Driessen 2013) raises numerous issues. One of which is the possibility of leaving the cows by themselves for days, checking on them through robot-generated data and webcam. If cows are to a large extent 'left to care for themselves', they are to be enabled to do so adequately, was the emerging shared understanding of the role and responsibility of the farmer.

Ethical (or political) debate about the proper materialization of these new practices took implicitly place in terms of proposals for tinkering and experimenting. Discussions within the group of farmers for instance delved into the variety of practical meanings of voluntariness, and possible ways to shape the (remote) interaction between cows and farmers. One element of the newly arising dairy farming practice is the requirement of breeding more robust cows that would be able to deal with harsher circumstances. New notions of efficiency, welfare, naturalness, care and responsibility were explored in learning about how to employ the mobile device in the newly arising situation; a situation in which perhaps there would no longer be a need for high yielding cows, as the guiding farm indicator is no longer the amount of milk per cow, but the amount of milk per robot. Then cows could be deployed that would be milked only once a day, with the robot still functioning to capacity as long as a large enough number of these cows are involved. In this 'more natural' set up, the animals and the land are no longer the scarce production factors, only the robot is.

⁸³ Increasingly in the Netherlands and in other European countries, nature reserves are managed using semi-wild 'dedomesticated' grazers such as Heck, Highland or Galloway cattle and Konik horses for their ecological role as cost effective 'mowing machines' (Lorimer and Driessen 2014).

With the proposal for shifting the practice from intensive farming to (include) nature management, adjustments were discussed on what would be considered adequate care in the new situation without housing, and how to make sure the cows are enabled to care for themselves. One change in the practice that was considered important would be to synchronize the yearly calving of cows to occur in spring, as then more feed is available and calves would not need to be protected against winter conditions. Another issue was whether cows in their new situation (in nature reserves or on remote fields of a farmer) would need protection against the rain. According to some, cows gravely dislike rain, as farmers have experience with herds quickly moving to the barn as soon as it starts to drizzle. Others claimed they were able to train their cows to stay put and keep on grazing, and now no longer appear to be bothered by it.

It was acknowledged that the productive use of these animals make for specific responsibilities, understood as part of a relation of care (cf. Harbers 2003). Naturalness therefore is not the only source of moral norms on the farm; the efficient use of resources, productivity, and the cows not being idle (and underperforming) are other salient norms. Cows feature as natural, but also as actors, as involved in processes of learning, as individuals (some are stubborn), their behaviour being viewed as depending on breeds, on feed, on the way they are approached by farmers, etc.

A visual intervention: landscape painting as a form of ethics

During my involvement with this group of farmers and technologists, I had a more developed sense of the question nagging me in the prologue at the pig farm: what can be an interesting role for a philosopher as part of this process of tinkering and more-than-human deliberation? How to engage with them in a discussion in which I do not try to make them 'lose their concepts', but rather entice them to look in new ways at the practices they are unfolding? This would be not a matter of telling them about what society wants, or teaching them how to be ethical farmers, but to help them realize that what they were doing involved reimagining relations between farmers, cows and the land, together with attending notions of care. As part of the new forms of dairy farming they were envisioning, the physical and cognitive abilities and the genetic predispositions of what it means to be a good cow had to be re-imagined – a process that also involved generating a new aesthetic appreciation of a different type of cows and of (semi-) natural landscapes.



Image 1: 'Landscape with milking robot and cows' Photomontage by the author, 2009. Based on a photo of the mobile robot 'Natureluur' by the author and the painting 'Landschap met Vee' by Jan Kobell, 1804 (Rijksmuseum Amsterdam).

With the detailed description of the shifts in dairy farming practices that emerged first with the use of a robot and then with its mobile version, I aimed to grant these practitioners and their animals some of the 'status' of being engaged in ethical, philosophical, and political activity; if only in order to try and give more weight to their views and experiences in ethical and policy debates. But how to contribute to these ongoing discussions in a way that would help them imagine the various changes entailed by getting the mobile robot to work?

Together with Leonie Heutinck, I have published a 'lay' summary of the description of milking robot co-evolution in a journal for farming professionals (Heutinck and Driessen 2010). Accompanying the article was a photomontage of the mobile robot inserted into the landscape of a nineteenth century cattle painting. In this way, I tried to communicate and emphasize the culturally and normatively paradoxical character of this new device: a high tech means to in some sense return to

primordial ways. The cow that just came out of the robot is a premodern one who steps back into a pastoral landscape. Thereby it is a portrayal of an innovative technology that could help to maintain and recreate traditional small scale landscapes of pasturing cows.

Here, the robot can be seen as a monstrous 'machine in the garden', in glaring opposition to the rustic and pastoral field on the right. On the other hand, the type of cows that might accompany the nomadic robot could be different, a more robust breed (cf. Theunissen 2008), than the high yielding but in some sense fragile 'professional athlete' Frisian Holstein that is grazing in the background. And the landscape (a term that originated to denote a genre of painting) which comes with particular applications of the robot could be a departure from the highly rationalized fields and rather rigid tree lines on the left, as it may allow for the milking of cows in nature reserves with different standards of productiveness and shifted meanings of functionality.

The new cows milking themselves out on the pasture are bound to come with intricate new technologies. With their yellow ear tags, or perhaps even 'remote controlled' devices attached to their ears, these animals are immersed in relations of freedom and control in different ways than the premodern tie stalls these painted breeds would have been used to. Even though the pose of emerging from the robot of the cow in the front seems natural, she appears still somewhat unsure in her movements. A process of adjustment is still ahead, and the eventual bovine species that will follow the 'leader robot' around the nature reserve may look and move very differently.

The image not only emphasizes the contrast between high tech modernity and romantic pastoralism. Nor is it only saying that paradoxically the robot allows for a return of the cows to nature: to become a breed aimed at robustness rather than productivity, for herding in natural landscapes rather than strip grazing highly productive artificially fertilized and optimized fields. Also, the image is meant to convey the ambiguities involved in technology development as opening up new ways of thinking on current and possible practices. A concept (or ideal) such as naturalness is in debating these developments not meaningless, even in the face of this type of high-tech devices, convoluted socio-technical imbroglios and nature-culture hybrids. What the image indicates is that the practical normative meaning of 'natural' is constantly to be reinterpreted, depending on the particular mixture of biopolitical regimes the animal is to live under (cf. Lorimer and Driessen 2013). The

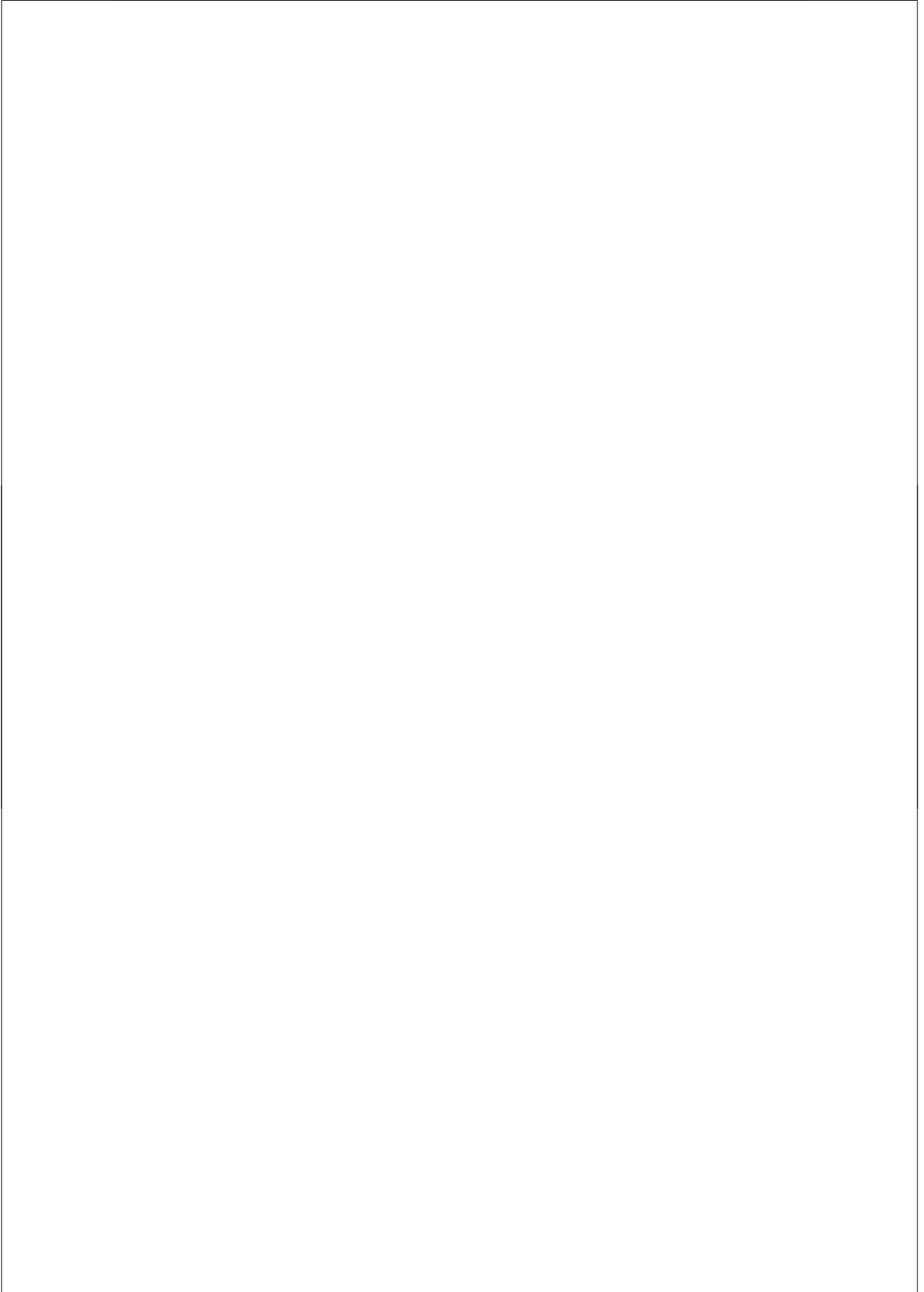
character of this new cow would be the product of ongoing interactive experimentation in which the emergent animals take actively part. And the *liveliness* (as opposed to the cows turned into mere objects) and *naturalness* of the animals would be a matter of practical and cultural commitment, rather than only something to be defined by natural-scientific research.

Or, this image may help to produce a dismissive response, on how even semi wild cows are now entering a regime of daily exploitation, and on how even nature reserves are by this mobile robot turned into productive land rather than authentic wilderness.⁸⁴ Thereby, the more-than-human process of *bricolage* around the mobile robot may give material shape perhaps also to a “questioning whether or not the basic processes of our current social formation are antagonistic to farm animal wellbeing, requiring an entirely different social formation if substantive changes are to be made” (Stuart, Schewe, and Gunderson 2013, 3–4). Either way, the pensive and questioning gaze of the cow in the middle seems to call for a response.

The upshot of my involvement with the group that tried to make a mobile robot is an image, and a plea for an imaginative form of studying, and practicing, ethics and politics. It highlights how the conceptual analysis of central notions such as naturalness, relations, productivity, landscape, animal welfare, care and freedom can be explored in material ways by designing new systems.⁸⁵ And while interacting with (the behaviour of) cows through these technological media, the experimental learning process is turned into a matter of ongoing mutual taming – sometimes perhaps *rewilding*. Altogether this amounts to an intimate process of deliberating between selves and others, humans and non-humans, robots and animals.

⁸⁴ But then again, in the Netherlands the most pristine nature is situated on recently reclaimed land as part of an experiment in ecological restoration (Lorimer and Driessen 2014). Even wilderness is both symbolically as well as materially constructed, and to leave nature alone is found to require a lot of effort.

⁸⁵ Cora Diamond for instance has pointed to the way in which paintings such as Potter's Young Bull may evoke a world and life form in which particular concepts are meaningful (Diamond 1988).



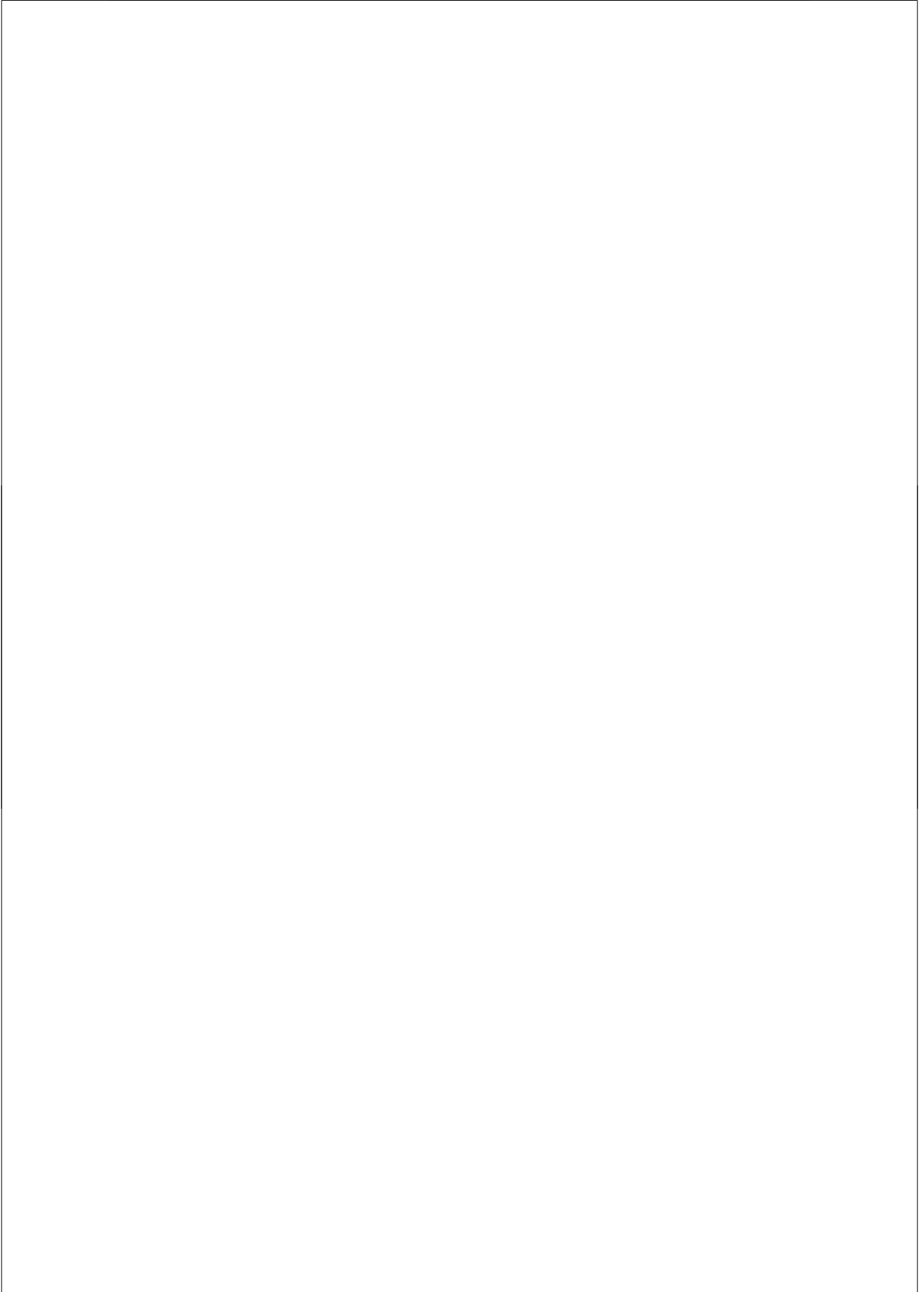
Part III

Playing with pigs

This part takes the argument of the previous two parts a step further: if ethics happens on the farm and in human-animal relations, and if new technological design projects can provide an opportunity for public debate, as well as for tinkering by and with animals and farmers, that means the way to study ethics on the farm and instigate public deliberation would be to start a technological design project that brings these together.

So, after merely describing milking robots, in vitro meat and pig towers and their practical and theoretical reverberations, it is time to put these lessons to the test. Could an intervention be created that would immerse broader publics in (human and animal) life on the farm? A design project is called for that newly discloses the world of the farm and that allows for *bricolage* with active animal participation.

Returning to the issue sketched in the prologue, the focus in this part is on pig farming, and on ways to move beyond existing farm practices and human-animal relations. The empirical material consists of discussions with farmers over the design of a multispecies video game, and the public (mostly web based) responses generated by publicizing the project. Theoretically this part is informed by work in animal philosophy, animal sciences, debates on (game) design and developments in the philosophy of mind.



Caring for bored pigs: game design as multispecies philosophy

“only carcasses and pets remain”
— John Berger, 2001

6.1 Modern human-pig relations⁸⁶

Pig boredom recognized by the European Commission

All 150 million pigs in the European Union are mandatorily provided with something to play with.⁸⁷ According to European Commission directive 2001/93/EC, Annex, chapter 1, article 4,

“pigs must have permanent access to a sufficient quantity of material to enable proper investigation and manipulation activities.” (European Commission 2001)

One example of this kind of material would be straw. However, this option is not popular with most pig farmers. Straw tends to clog the slatted floors that are meant to allow for manure to fall through. And straw is thought to pose an animal health or even food safety risk, as it is considered a source of pathogens, compromising the hygiene standards of intensive pig farming. Thus, other ways to prevent pigs to bite

⁸⁶ Chapters 6 and 8 are due to appear together as: Driessen, Clemens, Kars Alfrink, Marinka Copier, Hein Lagerweij, and Irene Van Peer, (2014). What could playing with pigs do to us? Game design as multispecies philosophy. *Antennae, the Journal of Nature in Visual Culture*.

⁸⁷ Whereas the English version of the directive does not use the word play, the same directive in its Dutch translation explicitly mentions the requirement to allow pigs to play (*spelen*).



Image 2: two pigs and a metal chain with a plastic ball (on a farm that we did not collaborate with in our design project). (Photo by the author).

each other's tails need to be sought. Before routinely carrying out "tail docking" or the "reduction of corner teeth", article 8 states that "other measures shall be taken to prevent tail biting and other vices". Farmers are to some extent free in their choice of materials and type of objects to serve as pen enrichment, as long as it is more than a simple metal chain. Mostly this means the pigs receive a metal chain with a small plastic ball attached to it, suspended from the wall. But this appears to only mildly entertain the pigs, before they succumb to boredom and aggression again.

The *Playing with Pigs* project⁸⁸ I describe here is first of all and ostensibly about meeting this regulation that requires 'environmental enrichment' on farms, albeit in a digitally sophisticated way, aiming to do more to challenge the cognitive abilities of pigs. The European Commission's R&D press office published a news item on our project, thus granting institutional approval of a game as a (potential) way to meet the directive (European Commission: CORDIS 2012).

Below I will explain the design choices and experiences during the making of the first prototype game which we have been testing and currently seek to develop further. And we will use the various responses the project has already generated to discuss the kinds of meanings and implications that "playing with your food" (as the project was several times labeled in the popular press) could be thought to have. Thereby we explore the way in which design can be a form of moral deliberation and philosophical reflection that actively involves farmers, pigs and consumers.

Video games for pigs

The effort to merely design video games for pigs would already have been potentially interesting on multiple levels: as a way to publicly emphasize that boredom for pigs amounts to a serious welfare issue, and to highlight that current ways of meeting this regulation do not sufficiently entertain these clever animals. "But isn't this much too expensive?" is a common first response we received. Proposing to implement costly technology in the highly marginal economic reality of intensive farming may highlight how more obvious and cheap ways to improve pig welfare are currently also not considered being economically viable.

⁸⁸ This design project involved besides the author of this thesis several researchers and designers associated with the Utrecht School of the Arts, department of Art, Media and Technology: Kars Alfrink, Marinka Copier, Hein Lagerweij and Irene van Peer. In an early stage also Marc Bracke of Wageningen UR Livestock Research was involved. For an overview and the latest news see: www.playingwithpigs.nl

Moreover, picturing farmed pigs as video game players could contribute to a sense that they do not (necessarily) exist outside of our technological culture. While at the same time informing a wider public on how the actual lives of farmed pigs do not resemble those that pigs enjoy in the way still commonly projected in the popular imagination, in which they alternate lazy mud baths with wandering around the barn yard together with a rooster, a horse and a cow.

Creating a more interesting environment for farmed pigs is likely to reveal abilities of an animal about whom we in fact know very little. This is something that farmers and farm technology developers learned for instance with the introduction of automatic feeder systems that can monitor and optimize the individual feeding



Image 3: Piglets and a ball that was brought to the farm by animal scientist Marc Bracke, for our first on-farm design session with pigs. Right away, the piglets started to individually differentiate themselves, as some were more daring than others. Also it became clear that the piglet in the foreground was more interested in the camera equipment and the human behind it than in the ball that he or she was meant to play with. (Photo: Playing with Pigs).

behaviour of pigs through the use of radio frequency identification collars. In no time, group housed pigs were found to 'hack' these systems: some carefully waited for their pen mates to present themselves to the automated feeding station and be identified by the system. Upon the opening of the doors they would then forcibly displace the identified pig and gain entry instead, earning themselves an extra ration. Others have been found to pick up collars lost by their fellow pigs to check whether these give access to extra feed.

When we discussed the possibilities of games for pigs with pig farmers, this led them to describe a variety of experiences with the animals in which they highlighted their individuality, curiosity and resourcefulness. In this way, the mere thought of pigs playing video games already instigated a particular type of portrayal of pigs. If only for the most common first response of people who hear of our efforts:

“Yes, pigs are really intelligent you know.”

Pigs playing with us: rendering them both pet and carcass?

Besides the already ambitious goal to produce something that would make pigs momentarily forget about their predicament and stop harassing each other, what our project aims to create is not (just) a high-tech alternative to straw, but mediated interaction between farmed pigs and humans. One way to argue for the inclusion of human players is to claim that humans can provide a more interesting and dynamic play experience to the easily bored pigs than a mere digital opponent could offer. Entertaining them does make for a true challenge, as they are known to grow bored again quickly after getting used to a particular toy. But with the efforts to realize *interspecies play*, between confined pigs and their prospective consumers, the project aims to achieve more.

John Berger has famously argued that (late) modernity is characterized by the 'disappearance of the animal' (Berger 2009). A situation in which animals may be ubiquitous in popular culture, but only to figure as signs and symbols rather than being vividly present themselves. Pigs are no exception to this phenomenon. Indeed (in the West) we find ourselves surrounded by imagery of pigs. Even pig farmers can be heard to complain of the endless amount of pig themed items they receive as birthday presents from acquaintances, littering the house with pig shaped bottle openers and cigarette lighters. At the same time, farming and its peculiar relation to animals are no longer part of the cultural repertoire of most people (Harbers 2003; Diamond 1988), as was also argued in chapter 2 (Driessen 2012). Having direct

interactions with certain individual animals, caring for them, and then proceeding to kill and consume them, may throughout history have been common practice, but has more and more come to be viewed as irreconcilable. The intimacy and ambivalence (Mizelle 2011) that characterized human–pig relations from primordial times up to the agro-industrial revolution, has in the 20th century been replaced by a complex (and perhaps even more ambivalent) psychological mode of actively cultivated selective ignorance. Even contemporary industrial slaughterhouses are designed so that no worker believes him- or herself to do the actual killing (Pachirat 2011).⁸⁹ Thus we live in a culture in which, in the words of John Berger, “only carcasses and pets remain” (Berger 2001). One of the farmers involved in our project agreed:

“In the early days, life and death were closer than now. Animals are currently either seen as children, or mere production animals, and about the latter we don’t want to know anymore. The way in which farmers are able to think, to both bond and let go, hardly anyone does anymore.”

But what happens if we invite people to try this again? Media reports in response to our project highlighted how allowing people to ‘play with their food’ (Crecente 2012) is a potentially unsettling invitation, disrupting the neatly zoned cultural practices of playing with our family pet and dining on intensively produced meat made from animals we have never met alive. This has led some who self identify as vegan abolitionists to welcome the project, albeit with reservations. ‘Vegansaurus!’ for instance wrote:

“I’m having a hard time deciding how I feel about this news! That must mean it’s deep, right? I mean, on the one hand, users get to play with cute pigs, the pigs get to have fun, and everyone bonds. I definitely think a game like this could help a lot more people realize how smart and awesome pigs are and push them away from eating the little buggers. But on the other hand, what about the people who play this game and then go eat some bacon? That requires such a deep level of denial it can’t be good for our species.” (‘Vegansaurus!’ 2011)

⁸⁹ Thereby eerily resembling a common view of the material organization of the holocaust, for instance described by Bauman (2013) as a prime example of how modern bureaucratic apparatuses produce the absence of an experience of responsibility and foster the ‘overcoming of an animal pity’.

At the same time some farmers responded positively to the idea of the game as a way to educate the public on pig farming practices. An interactive set-up could then be considered as a 21st century farm visit not mired in nostalgia. Digitally mediated interaction with pigs would deploy what is currently becoming the prime mode of human communication to reveal that animals are still here, somewhere, among us. Thus, the game would provide a glimpse of modern meat production, the way it actually happens (with a game added). A practice which various farmers we met were quite eager to explain to –what they feel are– urbanite consumers alienated from true rural life.

“I realize that games such as this wouldn’t be quite the same as raising an animal, but I’m curious to see what it would do to the massive psychological barrier that we, as a society, have created between us and death.”
(LemonFrosted, at ‘reddit.com/askscience’)

Part of the problem, as several farmers we have met believe, is that pigs have become invisible to the public. This is thought of as a reason for the lack of appreciation of their efforts to care for pigs and the lack of willingness to pay for welfare improvements.

The often lamented discrepancy between *citizen* and *consumer*, the one supposedly demanding animal welfare and the other cheap meat, in this project is not addressed by attempting to turn consumers into citizens, but by adding a third figure: someone who plays with pigs (and thereby a fourth, the pig). Will Playing with Pigs be a way to confront a meat eating and animal loving population with the inconsistency or even *schizophrenia* of their consumer choices? Or does it instead allow for the crafting of a postmodern, high-tech, digitally mediated version of Berger’s peasant lifestyle? The (this time perhaps ironic, or at least self conscious) cultivation of the sensibilities and self understandings associated with living in close connection to animals that are also food? To happily play with our pig and eat her too?

“I wonder if this would make the human player more likely to empathize with the pig or make them less likely to empathize with anyone.”
(ContraPositive, at ‘reddit.com/askscience’)

To some extent, what the game could do is generate an experience akin to that of hobby farmers, who in their marginal form of agricultural production may blur cultural categories of ‘livestock’ and ‘pet’ (Holloway 2001). Holloway however stresses the importance of spatiality and embodiment in these ambiguous relations

– whereas the kind of situated morality projected by digital interaction can be expected to be of a very different kind. Moreover, hobby farmers, let alone premodern peasants, are not likely to characterize their dealings with their pigs as ‘play’.

What would a game look like that is interesting as an intervention in the situation of contemporary pigs and their consumers? In this and the next chapter we will explore this question together with farmers, prospective human players, and pigs.

6.2 Maintaining interpretive flexibility: making a boundary object for deliberative play

With the multiple aims that the ongoing project hopes to achieve and the rather wide ranging public responses it received, its meaning and our intentions were continually questioned: Is it ‘just an art project’ or a serious attempt to improve the welfare of pigs? Is it a matter of straightforward game design with merely an extraordinary kind of end-users? Is it a hoax? Is it truly meant as a way to meet EU regulations? Is it an agricultural technology fully aligned with intensive agribusiness? Or is it a subversive intervention in the debate on animal production that is designed to make us see pigs as lovely, playful creatures?

So far we have tried to combine all of the above within the same project. For our design to be productive in connecting various types of interests and views, the ongoing challenge is to maintain enough ‘interpretive flexibility’ (Pinch and Bijker 1984) to make sure that the project is deemed relevant to four different practices that have of late started to appreciate animals as potentially active participants rather than objects of control and representation: the arts and artistic design, animal behaviour studies, philosophy and social science research, and attempts at *transition management* in terms of *system innovation* (Bos, Groot Koerkamp, and Groenestein 2003).

Thus the game may function as a purposefully designed *boundary object* (Star and Griesemer 1989) that connects disparate social worlds: making game designers spend time with pigs, farmers and other participants in the pig industry, experimenting with new ways to be attentive to pig behaviour and discussing it together. Indeed various audiences have started to assemble around this single

‘conversation piece’. In the process they generate ideas and knowledge that cut across disciplines and practices, but also connect disparate modes of experiencing and debating ethical conundrums.

From persuasive or critical, to deliberative play design?

Like the strands of video games that are conceived of as ‘critical play’ (Flanagan 2009) or ‘persuasive games’ (Bogost 2007), our design is explicitly meant as a societal intervention. With this intervention we do not claim to be morally neutral but intend to draw attention to current farming practices that we try to reveal in new ways as being problematic. But unlike many of these types of games, our project is not committed in advance to a particular political aim or moral ideal. Thereby it is not so much an attempt at being ‘persuasive’, but rather a form of critical play that we would call ‘deliberative play’. It is an attempt to design a space for new encounters, self-transformation and open ended forms of deliberation; a space in which room is created also for farmers to reflect on their experiences and express their views; and a space for deliberation in which animals are vividly present. Though we hope to provide a subversive and potentially unsettling experience with our intervention, the exact normative outcome of what people should take away from it is not inscribed in the design; if only because we are not sure of that ourselves.

Relating to one’s moral self

Navigating between artistic and agricultural design, we hope to maximize the ‘world disclosing’ potential of this intervention, which would involve an active reappraisal of what it means to be a moral subject in relation to animal production, as described in chapter 3 (Driessen and Korthals 2012). The mere idea of playing with pigs already made commentators (e.g. on the web) explicate particular ways in which they related to their own moral positioning.

“You guys are all just chickening out to the real issue, that this app is made by vegetarians to get us to stop eating real food.....” (‘StrangeKnight’, at ‘the Dailywh.at’)

This was a suspicion expressed by an anonymous commenter in response to our concept video. The comment implies the conviction that knowledge and bonding would result in vegetarian diet choices, while also in an explicitly ironic way refraining from this type of personal engagement. Others expressed similar

experiences of probing their moral commitments while drawing on a variety of registers – from frank accounts of moral inconsistency:

“I’m torn. I think it’s almost kind of sick as it makes you remember that these pigs aren’t stupid. And yet, I love bacon.” (‘DavidDoel’, at ‘The Verge’)

To stronger dismissals of the idea of combining eating and play:

“I have no idea how to vote on this "quick poll." It seems quite psychotic to: (1) demonstrate that an animal is very intelligent and has a winning personality, and (2) provide that animal with the chance to play a game that utilizes and exercises those traits..... only (3) so you can feel a little bit better about killing it!!!!!!!!!!!! I adore pigs (and would never eat any part of one). And I'm all for finding ways that they can play and be entertained. But I have to admit the video left me a little queasy and sad.” (Cindy B, at ‘care2.com’).

And highly ironic forms of over-anthropomorphizing:

“I wish pigs were not so delicious, because they seem like really nice people.” (‘pancakesforone’ at ‘Mashable.com’)

This type of responses, in different ways probing the experience of watching the video, reveal the complex ways in which people may relate to the eating of animals and how they cultivate themselves as (here anonymous, web based) public personae to deal with the ambiguities involved in human-animal relations.

6.3 Designing with pigs as doing multispecies philosophy

Besides it being a public intervention framed by relational and contextual understandings of animal ethics, this project also experiments with alternative genres of investigating philosophical ideas and ethical concerns. Do philosophy and ethics necessarily ‘happen’ only in a discursive practice that aims to articulate arguments in rational debates? Or could this type of design project be a way to foreground the materially entangled, experiential and imaginative nature of what it means to be a moral person? And could it be a way to investigate a different kind of

thinking about human and animal minds and relations? The ongoing design efforts are informed by responses of human commentators, by debates in fields such as ethology, animal welfare science, animal ethics and philosophy; but also by the farmers and the pigs present at our farm visits. In this way, the process of designing interspecies games can itself be a type of research, bringing ‘more-than-human’ theorizing to the actual sites of intensive pig farming.

Animals are (at least in certain parts of academia) increasingly appreciated as “good to think with” (Beisel, Kelly, and Tousignant 2013; Wilkie 2013); see Levi-Strauss (1966) for the original phrase. When animals do not just figure as mere stage props in such a way as to make humans shine in contrast (Tyler 2012), contemplation can be a genuinely shared and situated activity. Thinking is then no longer thought of as limited to what happens inside human brains. Nor just inside animal brains: Francoise Wemelsfelder, an animal scientist specialized in pig boredom, has argued how the traditional view among animal behaviour researchers of (animal) consciousness as purely internal and intellectual, instead of as an inherently expressive process, has stood in the way of more lenient approaches that allow for more elaborate interpretations of animal behaviour:

“Conscious awareness does not drive the behavioural machine from ‘within’, but comes to expression in action, as an emergent property of the behaving animal as a whole” (Wemelsfelder 1999, 44).

We could extend this understanding of the mental to human animals as well. And since designing can be a fruitful mode of ‘external’ thinking, through materializing ideas and tinkering with these on the go, the process of design as a mode of communication lends itself well to this cross-species form of testing ideas. The continuous tweaking of designs in response both to play tests with pigs and to public commentary moreover offers a way to open up farm animal welfare debates to new audiences, extending ‘citizen science’ to include ‘citizen philosophy and ethics’. In exploring these questions, the project became a space for encountering other viewpoints, including those of farmers. And this is a space in which pigs were actively present too, as we like to emphasize their role as ‘co-designers’ (Schwarz and Krabbendam 2013). The design project features the animals in an active role, responding to prototype testing and revealing new and unexpected behaviours. At the end of the day they are the sole experts on what makes for interesting play for



Image 4: designing with pigs, as a material and embodied process of finding things and activities of mutual interest.

them. (Though we should always consider that their unwillingness or failure to play could be a function of the environment in which they have grown up and their genetic make-up that has mainly been geared to fast growth.)

Conducting science with animals

This mode of doing science (and philosophy), seeking to actively involve animals, is also inspired by the lively tradition of field ethology –in the wake of Jane Goodall and Dian Fossey– in which human observers are actively present and acknowledge their intervening in the social world of the animal subjects under study (e.g. Smuts 2001). Hereby, the study of what animals do can shed its behaviourist blinders, allowing researchers to discern more than mere stimulus-response mechanisms. Spending scientific time with animals then becomes more akin to anthropology – with its tendency of ‘going native’ as opposed to a strictly policed scepticism over the meaningfulness of local practices. This is a way of looking at animals to produce qualitative data such as narratives, with an eye for individual differences and complexity of affective encounters, rather than just collecting abstract measurable features of behaviours. In more conventional forms of animal behaviour research, this approach is easily dismissed as merely subjective, anecdotal and anthropomorphizing. But increasingly ‘cognitive ethology’ involves viewing animal behaviour as intentional, in terms of reasons, desires and knowledge that animals may have, calling for a hermeneutics of animal behaviour (Corbey 2005, 158).



Image 5: prototype testing at the intensive pig farm. This allowed us to tweak our design in the presence of the pigs, who thereby provided instant feedback on our design choices.

The challenge is to find ways to understand animals that acknowledge them as being different from humans, without at the outset inscribing in what ways exactly; and without assuming an absolute and insurmountable species barrier to exist between us and them that would make communication impossible. Could a game be a way of realizing this type of encounters that are both intersubjectively meaningful and scientifically interesting?

New forms of ethology continue to be explored which disband with the fiction of the disinterested and (to the animals and the reader) absent observer (Vitale and Pollo 2011). This particular ideal of objectivity is increasingly acknowledged as an elusive goal that is unachievable in practice and as not the most interesting way to learn about animals anyway. Instead, in this type of studies the researchers can start to focus on the “different manners in which scientists’ bodies are actively engaged when interacting with the animals they observe in the field” (Despret 2013, 51). Under the banners of ethno-ethology/etho-ethnology’ (Lestel, Brunois, and Gaunet 2006), ‘anthropology of life’ (Kohn 2007), or ‘multispecies ethnography’ (Kirksey

and Helmreich 2010) more symmetrical modes of studying humans and animals have been propagated that could perhaps be characterized as ‘learning with’ animals. The basic assumption here is that humans and animals do not live separate lives that merely influence each other “around the edges” (Lestel, Brunois, and Gaunet 2006, 156). These authors have pointed instead to an understanding of humans and animals as cooperating and changing each other, socially, cognitively and physiologically, in the course of shared actions in which we complement each other’s skills. They especially draw attention to the material artefacts subsumed in these ‘human/animal combinations’, and how these help to institutionalize certain relationships and provide a particular cultural backdrop of conceptual schemes and modes of perceiving (Lestel, Brunois, and Gaunet 2006, 156). This means designing particular material artefacts can be a way of exploring how humans and pigs may influence each other in becoming new and potentially more interesting pigs and humans, both actively taking part in a shared material culture, where both human and animal are mutually produced (cf. Ingold 2012).

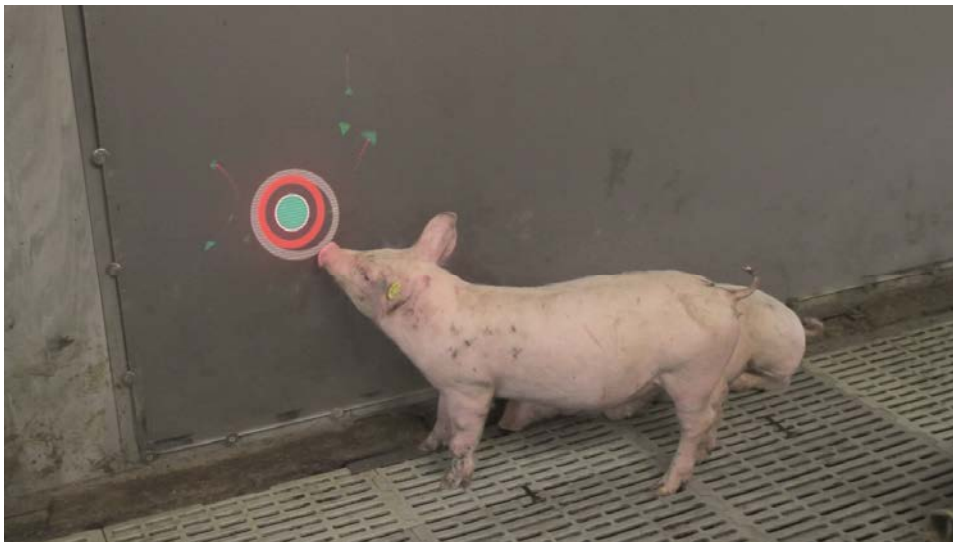
Image 6: screenshot of the concept video, with a young man with an iPad looking at the Michelangelo inspired Pig Chase ‘logo’ of a hand touching the snout of a pig.



Pig Chase

And this is what we came up with as a design concept after a series of discussions and play tests: *Pig Chase*, a first attempt to realize digitally mediated interspecies play in an intensive farm.

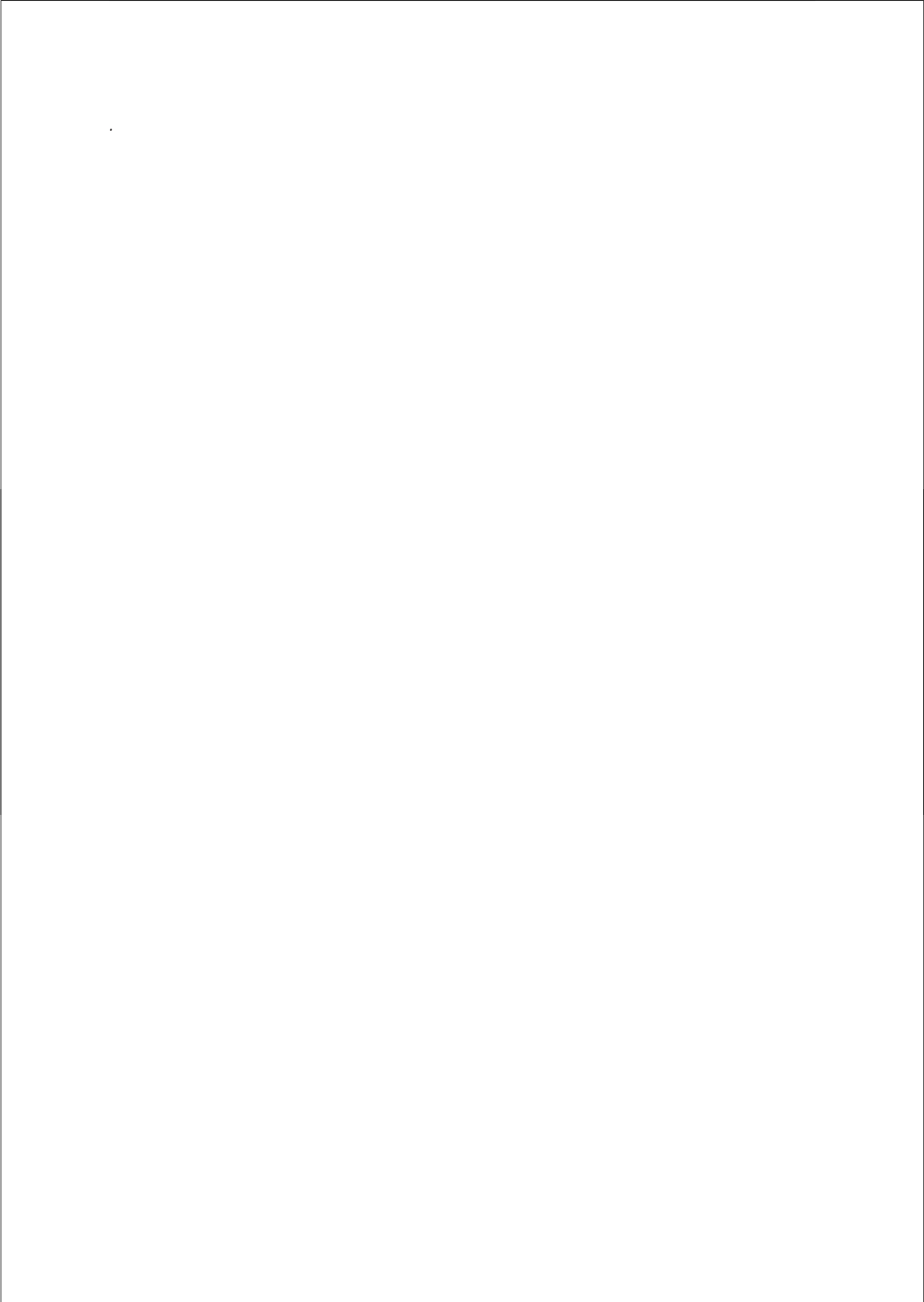
Pig Chase is a multi-species videogame concept in which pigs living on a farm are provided with a large touch sensitive display that is connected to the web to allow them to play with distant humans, perhaps their prospective consumers. On the screen in the pigpen, a ball of light moves around that is controlled by a human player via a tablet computer such as an iPad. When the pigs touch the projected ball, it fires off colourful sparks. Humans move the ball of light with their finger and see the pigs' snouts as if they are on the other side of the screen. If pigs and humans move in harmony, and when a pig's snout and the human's ball of light together move through a goal triangle that emerges on the screen, a colourful display of fireworks is triggered. The challenge for humans is to maintain contact with the pigs' snouts, while the pigs need to stay in touch with the ball of light. If they do not, their ball of light fizzles out, and it's game over for both human and pig player. The number of targets a human-pig duo manages to hit in one session is kept track of and shown in a high-score table. Who directs whom is unclear; both human and pig, in order to play the game, would need to learn to move in unison with the one on the other side of the screen.





Images 7, 8 and 9: screenshots of the concept video that showcases the intended Pig Chase gameplay (see: <http://vimeo.com/29046176>). This video (and thus the images above) combines footage of a farm with digitally manipulated imagery. The game as it is shown here did not exist as such at the time of shooting the video. The pigs that are portrayed did interact with a (small) dot of light projected on the screen, which generated their interest. In the subsequent prototype testing the game as depicted here was to a large extent realized. For (a non-tricked) view of that process, which is also depicted in the earlier 'making of' images above, and which features the farmer playing with his own pigs via an iPad, see: <http://vimeo.com/53161644>

So far the design work has reached the prototype testing phase, which means a publicly playable and downloadable interspecies game does not exist yet. In the following chapter we will discuss a number of design considerations that have come up so far. And we will highlight how already the process of designing with pigs and presenting the idea to human audiences itself constitutes an interesting intervention in the practice of and debates over pig farming.



Five criteria for meaningful play with farmed pigs

"We entertain each other with reciprocal monkey tricks. If I have my time to begin or to refuse, so has she hers"

— Montaigne, *Essays*, 1595

When creating an interactive, digitally mediated game for humans and farmed pigs to play together, can we say anything general on what would make for a mutually and recurrently appealing play experience? And what kind of game design would be a worthwhile societal intervention? Elaborating on the considerations in the previous chapter, we here discuss five interrelated questions that we grappled with during the design process in a hands-on way, together with farmers, pigs and other (mostly anonymous) commentators. These are questions regarding: 1) subversivity, 2) naturalness, 3) species hierarchies, 4) symmetry, and 5) voluntariness. Even though we will explore these five questions in relation to the design and only tentatively answer them, seriously engaging with each of these questions can be thought of as criteria for meaningful interspecies play design.

7.1 Subversive encounters?

The subversive character of experiencing a relation with a pig would work best if the animal that people play with is actually destined for slaughter, rather than being merely a generic representative of his or her species. Thus the pigs we are to interact with ought to live on an intensive farm, not just some idyllic pig park, farm sanctuary, or animal behaviour research facility. Only in this way would we be 'playing with our food' and undercut the existing strictly delineated 'moral zoning' of how we are to relate to animals. This does not mean the game is directly

subverting the hegemonic powers that be, attempting to overthrow *the system* or the state in the classic understanding of being subversive. Instead, it is aimed to function in the tradition of artistic countercultural interventions that mean to disrupt common ways of thinking and everyday practices (cf. Flanagan 2009, 10).

By situating the game on a farm we can also use the game to truthfully show the actual living conditions of the average farmed pig in the Netherlands. We however did not seek to offer a view of a modern pig farm as only a 'spectacle of suffering' reminiscent of the kind of candid animal activist footage of intensive production sites. (Such an approach would of course also quickly cut short our access to these farms.) The film clip showcasing *Pig Chase* offers a view of the common Dutch pig production facility, with piglets huddled together indoors on plastic slatted floors, their inquisitive movements and allround cuteness contrasting with the hard materiality of their confinement: concrete walls and metal bars.

At the same time, the more ambitious farmers seeking to improve things were the ones willing to collaborate with us. For them, the game project could help to publicly promote welfare improvements also beyond the minimally required pen enrichment, such as refraining from 'tail docking' and providing access to an outdoor space. The pigs portrayed in our concept video have curly tails, a rather unique feature on intensive farms in the Netherlands, where most pig tails are still routinely cut off to prevent other pigs biting them. In this way, the game may help communicate the necessity and attractiveness of these improvements to a wide audience. Even though we thereby do not provide an impression of average pig production conditions, the plus side of situating our game in such an 'improved farm' is the implication that merely adding a game to current intensive farming operations far from 'solves everything'. In order to significantly increase pig welfare, a much wider set of conditions will need to be changed, including skills of the farmer to manage an improved farm system.

In this way, the project would seem to come down at the *welfarist* side of debates on animal use, rather than in a more truly subversive way aim for more radical reconsiderations of animal production. But this is not necessarily the case. Apart from deciding on the right type of farm for implementing a game, the issue of subversion comes up in other design choices too: in order to generate a sense of human-pig encounter, it should be clear that we are playing with real, not merely 'virtual' pigs. Perhaps the most central question then lies in how we visually connect the pigs to the human player: should we be made to look the pig in the eye? We

could enable humans to learn to recognize individual pigs by their facial features. Or we could allow for a look ‘over their shoulder’ in order to identify with them as if they are our game world avatars such as in a ‘first person shooter’ type of video game. And should we design the game-play to be competitive or collaborative? Either way, the pig should not be merely scripted as a figure whose movements are directed by the human player. These design choices are linked to the question on the kind of affective responses that playing the game may generate. Would people after playing with pigs appreciate them more as a species? Or will this lead not to the appreciation or perhaps even love for pigs generically, but just for the one you played with?

In the *Pig Chase* concept video, humans see their pig playmates through a semi transparent pane. This allows them to discern the snout and sometimes the eyes of the pigs, but the precise facial and bodily features remain fuzzy. Besides considerations of game aesthetics which favoured a semi abstract figure, the idea was that hereby the pig is visible enough to generate an affective relation, but generic enough to represent the mass of farmed pigs. Through this experimenting with levels of translucency and recognisability, the design probes the affective process of individuation (cf. Buller 2013).

The screens we have come to closely attach ourselves to have been described as newly ‘intimate places’ (Kamphof 2011, 269), being the sites where much of our daily lives and relations to the world take place. But is swiping your finger over a tablet’s touch screen in the way it is scripted in *Pig Chase*, moving together while (not quite) touching the other, enough to establish a type of affective, or maybe even physical contact? Perhaps it only emphasizes the impossibility of this type of contact, evoking the confined state of the being on the other side of the glass: As if visiting a prisoner, the player is invited to perform the well worn film trope of touching hands (in this case hand and snout) separated by a thick glass pane, as the only way available to establish contact and express love and support.

What is assumed throughout by those worried about (or hoping for) the experience of playing with pigs to have personal implications, is the idea that play leads to bonding between the players. Something that is not self evident, as less benign and even cruel modes of play do exist as well (Sutton-Smith 1997, 56), which we found one of our farmers to anticipate below. We will return to the question of possible relations afforded by particular interspecies digital games and the extent to which

these might generate experiences that would subvert existing farming practices. But first we discuss what some farmers thought of the idea.

Designing with farmers: on becoming a 'game farmer'

To explore the potential of this project for pig farmers, we set up a design workshop with a small group of them. The farmers responded to a series of 'paper prototypes' of possible forms of human pig interaction. From 'Pig-Tube' in which the human player is projected on the pigpen wall and is to visually entertain the pigs for as long as possible, to more haptic interfaces by which humans and pigs would engage in a physical ball game. Some of the proposals were dismissed by the farmers as too impractical, or in their eyes unlikely to reduce boredom enough for the pigs to refrain from hurting each other. With regard to realizing human-animal interaction, the farmers agreed there could be some potential for generating extra income through interactive gaming performed by their pigs; money that could then perhaps be used to invest in higher welfare standards. But farmers expressed their concern for human players to start bonding with their distant play palls. Upon realizing their fate, when the six month lifespan of the industrial pig would near, human players were imagined to perhaps even come and attempt to liberate their newfound pig friends.

"All very well, but they should not know where the pigs live. At some point it's 'game over'."

Thus, these farmers made it clear they expected that playing with pigs may lead humans not to maintain an appropriately distanced view of farm animals. At the same time, they insisted the game should be designed in such a way as to not allow others to maltreat or pester them. Thereby expressing a self understanding as stewards and guardians, caring for their pigs and responsible for how they are treated: "with respect."

But what if the human gamers would be willing to pay for their favourite pigs to live on, instead of seeing them taken away, replaced by a fresh generation of piglets? Our farmers had a mixed response when we put this idea forward. One was quite straightforward: "Sure I could also be a 'game farmer'. I want to raise pigs, not necessarily kill them." Another was more suspicious of this proposal, which questions the core aim and meaning of the practice of pig farming: "I don't know; something feels wrong here." He was not willing to relinquish the identity of the farmer as diligent food producer just yet.

7.2 Animal nature-cultures?

The project indeed appeared disruptive towards contemporary farming practices, as with many commentators our proposal to provide pigs with digital games generated strongly dismissive responses. An important element in this type of critique was that providing the pigs with technology is not an answer, but would only further alienate them from their proper environment: the outdoors.

“I don't know what it is but there is something about this that is disgusting. Possibly the point of providing this trivial stimulation when really if they had more room outside, with grass and mud they would be much happier.” (Chromis, at 'Mashable.com')

A number of commentators offered even more radical critiques of the game project, favouring the outright abolition of keeping pigs and turning them into food:

“Pigs don't need video games, they need their freedom to live their lives in a natural environment without being exploited, chased and killed by humans.” (Ricardo P, at 'care2causes')

With bringing video games into the farm, these domesticated animals are drawn into the virtual world of digital games; a place which by many is not deemed a healthy one for humans either. On a web forum on which concerned parents discuss their worries over the use of games by their children someone lamented:

“We already have our children sitting behind screens all day and now the animals go there too.” (Justine, at 'weetwatzegamen.nl')

Would a game further alienate pigs from their true interests and authentic desires: to go outside, into the mud?

Natural lives

One of the main questions during the design process was how to relate to this ideal of naturalness, and how to deal with the natural/artificial dichotomy. Starting in the late 1970s, a group of ethologists led by David Wood-Gush created an elaborate research environment called the 'Edinburgh Pig Park'. By placing production animals in a 'semi natural' environment, their behaviour could be compared to that in commercial housing conditions (e.g. Stolba and Wood-Gush 1989). They found pigs to still behave in ways that derive from their natural habitat. The *landrace* pig,

for centuries bred into the production animal we know now, appeared to perform behaviour that resembled closely that of its undomesticated kin. The same 'behavioural repertoire' as the wild boar in its forest habitat –foraging, nesting, etc– was revealed to potentially still exist in the intensively raised animals. Thereby the experiment refuted the (often implicit) argument that domestic pigs no longer have the behavioural needs associated with their ancestral environment; that they have become adapted to living in confinement. And as many people imagine, pigs have also been found to still enjoy a good mud bath, which they did since their days in the wild (Bracke and Spooler 2011).

Revealing such residual natural abilities and inherent desires of contemporary pigs is subversive to current farming conditions in a different way than playing a game with them might be. The critique of rearing animals under unnatural conditions could be undercut by portraying them as quite at home in our technological culture. On the other hand, the vehement responses stating that “pigs belong in the mud” not only stress the ideal of a natural life for pigs, but also seem somewhat protective of a uniquely human sphere of technology use. Perhaps from a worry that inviting animals into the more cognitively stimulating terrain of what then becomes a more widely shared technological culture could endanger the exceptional status of the human?

Technological lives

A rather more artificial setting to study pigs was created at the end of the 1990s, when animal scientists Stanley Curtis and Candace Croney set up an experiment in which they trained two pigs –named 'Hamlet' and 'Omelette'– to operate a simple computer game. Basically it was a motor control and memory test, in which pigs used joysticks to navigate on a computer screen.⁹⁰ The test subjects were first shown a crude drawing and later the same drawing again but this time next to another one. The task of the pigs was to point the joystick in the direction of the drawing they had seen the first time. If Hamlet or Omelette succeeded, they were rewarded with a chocolate treat. Another version of this system projected a small dot that needed to be manipulated with the joystick to a designated area on the screen. Allegedly, the pigs managed to do this when offered relatively small target areas, whereas a dog was found to be unable to steer the joystick adequately. Curtis

⁹⁰ See: http://www.youtube.com/watch?feature=player_detailpage&v=RpzpUeJ9HA8#t=154 (accessed 12 March 2014).

stated that while chimpanzees can also be taught to do this, pigs are much quicker to find out how to operate the game successfully.⁹¹

In public media, the image of a pig with a computer joystick and peering at a monitor raised a lot of (human) interest. The New York Times and Wired magazine featured excited news items on pigs who engaged in an activity that seemed (at the peak of the first ‘internet bubble’) to be considered the epitome of humanity. It was joyfully embraced as a logical development for most intelligent animal species. Eventually they were to join us on the ‘information superhighway’ on which we were in the process of collectively heading off. But connecting pigs to the internet today also produces dystopian concerns, as this commentator to our project expressed:

“This sounds like the Matrix, as if we could make pigs believe through computer simulation that they have a nice life outdoors and in the mud while actually they are crammed together and stuffed with hormones and antibiotics in a meat factory.” (weetwatzegamen.nl)

In our game concept we chose not to try to visually simulate a version of the natural habitat of pigs, or their undomesticated kin the wild boar. Of course one could digitally project a fairy tale forest in which to search for truffles, as a virtual reality that would be meant to ‘directly’ appeal to their surviving primordial desires and abilities. Could our *Pig Chase* design choice –not for a naturalistic but a retro style video game aesthetic– instill some sense of the near-human character of the pig? Or does it make for another instance of the anthropomorphic reduction to a human-like figure that some have argued to be the primary form which the disappearance (or effacement) of the animal takes in our culture (Burt 2001)?

What the classic game aesthetic can be seen to imply is that smart domesticated animals such as pigs only seemingly live outside of our technological culture. By alluding to anthropomorphism in the interface design we were probing cultural expectations of what animals are, where they belong and what they are supposed to do. Setting them in an overtly technological space –at least more high-tech than the standard concrete and metal bars of their confinement– allows us to imagine how they could be granted a much more active role in what is mostly considered a purely human domain: learning to appropriate artefacts and the planned use of tools.

⁹¹ See: http://www.youtube.com/watch?v=SOJjf_zoPDs (accessed 12 March 2014).

Any attempt at improving the plight of pigs by remaking their environment and allowing them to perform their species specific, 'natural' behaviours seems sympathetic. Should naturalness be the only notion that guides how we treat animals? Or could the capabilities that an animal is to exercise as part of a species specific kind of flourishing life (Nussbaum 2009, 370) also be developed in interaction with technology and humans? This question has become prominent in debates over the possibilities of promoting animal welfare in zoos and circuses (Keulartz and Swart 2012, 132). In these debates, the issue is raised whether we need to offer opportunities to the animals that are simulations of things in the wild which are 'naturally' of interest. Do we arrange for predators to chase their food and foragers to search for it, or are there different ways of having animals engage with the world? Should we conclude from Curtis's experiment: pigs can play with computers, therefore we should offer them a more natural environment?

By embracing the ideal of naturalness we risk reducing what we can perceive as authentic animal behaviour to only its underlying 'real' wild analogues. Animals then appear as subjects only in so far as they are natural in a generic species specific way. And with naturalness often defined as precluding the presence of human beings, this means animals cannot act meaningfully towards us, apart from running away. In this view, if we really have to create a virtual solution for their boredom, perhaps only a perfect '*Matrix* like' forest simulation would cater to the essential naturalness of farmed pigs and be the only way for them to be themselves in a situation of confinement.

Even though we can think of the environment of pigs being more or less natural, 'natural behaviour' is an elusive notion. We could define it as "behaviour that animals have a tendency to exhibit under natural conditions" (Bracke and Hopster 2006). But as Segerdahl has argued,

"Natural behaviour' is not properly a biological concept, although it aspires to be one, but rather can be considered a philosophical tendency to perceive animal behaviour in accordance with certain dichotomies between nature and culture, animal and human, original orders and invented artifacts." (Segerdahl 2007, 167)

Can animals meaningfully engage in behaviours that have no obvious equivalent in the wild? There may be a muddled grey zone of behavioural patterns exhibited in natural environments that could be performed in artificial settings too. Biologists

tend to define intelligence mostly in terms of relative fitness within an environment. This means it can also be understood as the capacity to develop mechanisms for coping with new environments. In zoo enrichment circles, this is (Shepherdson 2003, 85; Keulartz and Swart 2009, 135) The contemporary pig farm however is not the most interesting environment to learn to cope with. For intensively farmed pigs surely 'reality is broken' (McGonigal 2011), and the creation of a digital game environment might provide them with incentive structures and direct feedback experiences that would help them lead much more fulfilling lives than they do now. Indeed, when a pig would develop capacities previously unknown while interacting with a computer, isn't the animal unfolding its own 'natural' potential? Could consecutive generations of pigs interacting with a device that is more and more attuned to their behaviour develop their own dedicated material culture which brings out new sides of their piggishness?

Do the pigs need to be deluded in thinking it is really foraging what they are doing in order to attract them to a game, or can they be aware it is merely a pastime, a simulation, and still enjoy it, as 'just a game'? Could they realize that the things projected on their wall are virtual objects, not something potentially edible? Will they be interacting with something they appreciate as symbolic, as a sign? And will it be play? Do the animals know they are playing, or are they just curious, distracted? Or, what does play mean here? The iPad game *Cat Cat Revolution*, in which a tablet is encased in a mock 'cheese' frame and the cat player is invited to chase bugs running behind the holes of the cheese, is predicated on the simulation of naturalness (of a domestic kind) as a way to appeal to feline instincts. Does the cat just want to eat the bug sized mouse projected on the iPad in the cheese casing, thus growing increasingly frustrated? Or would the game indeed "cast cats as participants in the gaming experience" as some argue (*Cat Cat Revolution: An Interspecies Gaming Experience* 2010). There is a multiplayer mode in which humans control the virtual mouse with their smart-phone. Are there ways of playing in which the cat is aware there is a human competitor present, with whom he or she is playfully engaged?

Whether interaction amounts to play is not easy to establish, as play is notoriously difficult to define. But our focus on play may offer grounds to consider animals as more than only natural beings, in a restricted sense of behaving only in ways that are functional and useful for survival and procreation, since play cannot be fully understood in terms of the training of skills with evolutionary utility (Sutton-Smith 1997). Playing is also not necessarily a matter of competition or reaching goals or

rewards. Could pigs conceive the game installation also as merely a fun object to explore? Just to see if it can be destroyed perhaps? (That is a type of play which during the making of our prototypes we experienced to be one of the favourite pastimes of farmed pigs.)

7.3 Testing and ranking?

With his joystick operating pigs, Curtis aimed for the game interface to teach pigs a language through which they could let us know what type of farm housing would be adequate to them. But this type of research is also easily conceived of as a ‘test’ for positioning the animal at a particular stage on a scale of animal intelligence. Curtis’s game ended up situating pigs somewhere between dogs and chimps. More recently, an ethology experiment at the University of Cambridge has generated evidence of pigs’ ability to use mirrors – another well known type of test to rank animal species. After five hours of gaining experience, seven out of eight pigs were able to adequately use a mirror to find food. Instead of looking behind the mirror, these pigs immediately went to look for the food in the right place, visible only via the mirror. As opposed to non-mirror-acquainted pigs who first looked behind the mirrors (Broom et al. 2009). The Cambridge pigs however failed the ultimate test to establish whether animals have a ‘sense of self’: the classic ‘self-recognition experiment’. In front of the mirror they did not investigate the dye on their faces that had been applied while they were asleep. But this was thought due to the fact that pigs are often ‘dirty’, so they are used to having ‘spots’ on their faces (Milius 2009). Or perhaps pigs just can’t be bothered with how they look?

In public media interviews, Broom expressed his hope that with our increasing knowledge of the abilities of pigs to use tools or complex devices, their moral status would follow suit:

“if an animal is known to be clever it is less likely to be treated as a food-producing machine and more like a sentient being. Perhaps the conditions in which pigs are raised [...] may be improved as a result of the study” (Milius 2009).

This hope seems based on the assumption that moral concern is supervenient on intrinsic characteristics of species, that we attribute moral respect based on their

resemblance to humans and the extent to which they meet a particular notion of intelligence (besides sentience). The mirror experiment appears to assume an almost disembodied understanding of cognition, as if a Cartesian mind is making inner projections of the outside world, solving analytical problems based on primarily visual information. The self recognition test moreover idealizes the pensive probing of one's own face as the epitome of contemplation. Vicky Hearne for instance has critiqued "the idea that a concept of self must be expressed by a certain relationship to mirrors" (Hearne 2007, 200). She argued that for example dogs have a sense of mine and thine, which is however more likely to be expressed in their sense of smell.

Bertrand Russell already noticed that scientific observations of animal behaviour say as much about the culture and ideology of the observer as about the animals:

"It seemed that animals always behave in a manner showing the tightness of the philosophy entertained by the man who observes them. This devastating discovery holds over a wider field. In the seventeenth century, animals were ferocious, but under the influence of Rousseau they began to exemplify the cult of the Noble Savage which Peacock makes fun of in *Sir Oran Haut-ton*. Throughout the reign of Queen Victoria all apes were virtuous monogamists, but during the dissolute 'twenties' their morals underwent a disastrous deterioration." (Russell 1995, 95)

He goes on to discuss how animals learn. Something that was a matter of fierce debate between the school that argued for inner contemplation, and others who believed in a more random trial-and-error type of learning:

"Animals observed by Americans rush about frantically until they hit upon the solution by chance. Animals observed by Germans sit still and scratch their heads until they evolve the solution out of their inner consciousness. I believe both sets of observations to be entirely reliable, and that what an animal will do depends upon the kind of problem that you set before it." (Russell 1995, 96)

Play as test?

So how are we to establish new hierarchies, if any? What tests are we to subject the animals to in our culture? Donna Haraway has promoted that we look beyond the question 'do they suffer' which has enthralled animal ethics since Jeremy Bentham

or at least Peter Singer. But will we merely trade it in for a new question to establish a species hierarchy: 'Can this animal play?'

"Play occurs in only a small minority of the Earth's million or more animal species. [...] Mammals and birds, and perhaps a few fishes and reptiles, are the only kinds of animals known to play." (Sutton-Smith and Pellegrini 1995, 24)

From the idea that play is currently the central defining characteristic of what we *homo ludens* in our *ludic century* value in human culture, it is easily imaginable to generate a new hierarchy of animals, with towards the top those that in contrast to the rest would not be self evidently 'killable' (Haraway 2008). Or, instead, a form of ethical thought and practice might emerge that is not aiming to establish species specific characteristics for ascribing moral status on the basis of particular features (Coeckelbergh 2012). Will we relinquish the search for the essential defining feature of the human, as tool wielding, language using, abstract thinking animal? And do we then proceed in our probing of animal abilities to include questions that involve questioning ourselves, such as, "can I learn to play with this animal?" (Haraway 2008, 22). There still is a role for investigating the lives of animals in this approach to ethics, but it explicitly involves putting ourselves at stake. Interesting interspecies games then do not aim to measure abilities of isolated individual animals, but to see what kinds of human-animal combinations could be enticed to emerge together.

The differences in observations that Bertrand Russell described were indeed not (necessarily) due to a flawed methodology of one of the competing schools in ethology: the distinction between inner mental contemplation and outer behavioural trial-and-error can be argued to be in practice not so absolute.⁹² Moreover, the apes were brought in situations that made them respond with particular behaviours, making the findings about what they do true for those situations. This opens up the notion that animals share in our material cultures and ideologies; and not necessarily as mere passive receptacles of ideological projection by insufficiently objective scientists. The challenge is not to dismiss this experience of 'different times, different observations' as mere relativism, but in the words of Vinciane Despret: "to envisage ethological knowledge as constructing humans and animals at the same time, together" (Despret 2006, 209; cf. Haraway 1991, 31).

⁹² See for instance Wemelsfelder's (1993, 53) argument that empirically there is little support to clearly demarcate associative from innovative styles of learning.

7.4 Symmetry and reward?

Many imaginable pig-human interaction designs would easily just reaffirm the status quo: emphasizing that the natural place of a domesticated pig is the intensive farm, that the status of the human is obviously on top of any imaginable species hierarchy, and that the mass of millions of farmed pigs merely constitute an immense untapped source for human entertainment. How to avoid this outcome? In designing a meaningful interactive encounter between humans and pigs, it is important not only to make something suitably interesting for pigs, but also not to start by unwittingly inscribing what one may assume to be essential differences in abilities and interests of humans and animals.

Obviously, the animals should not figure in the game-play as mere ‘random generators’ in the way zoo animals are sometimes made to publicly predict the outcome of football matches or to beat fund managers selecting stocks on the stock exchange. While ostensibly pretending to take the knowledge and agency of animals seriously as communicating about our world, these animals are actually reduced to *chance automata*. Another detrimental approach would be to grant humans an experience of completely controlling the movements of a pig. Then the animal would become a living video game avatar operated by a human player, ultimately resembling the remote controlled cockroach that one can create with a *Roboroach* home order kit that comes with instructions for performing a ‘brief surgery’ to connect electrodes to its antennae, forming a ‘neural interface’ (‘The Roboroach’ 2014).

A more symmetrical exploration of existing and possible human-animal relations makes for a daunting design challenge. Especially when we want to create an interface that would both be truly appealing for the pigs and also allow for an active and meaningful presence of the pigs to human players. Some fine examples of interactive set ups created for and with animals can be found in the work of Natalie Jeremijenko. In one of her installations an elaborate interface is constructed through which a human can enter into a bodily struggle with the most powerful animal – adjusted to size– in the world: the rhinoceros beetle. Other set-ups aim to foster communication between humans and urban wildlife, such as a device which enables wild birds to communicate with museum visitors, by pressing buttons that produce pre-recorded texts to be played on the outdoor terrace. Depending on the button chosen by the birds, the visitors are informed about the relation between migrating

birds and zoonotic diseases, or even urged to provide some bird food in order to reduce the risk of this occurring. The latter button was found to be used most often. Jeremijenko's work explores what happens when humans and animals are brought into a more equal form of contact and through a shared material culture engage in more interactive forms of communication. And it tests our assumptions about the motivations of animals and their relations to us.

In the pig game design project we planned to likewise create an interactive setting in which mutual adjustment and learning can take place and new modes of interspecies communication are developed in an experiential and embodied (albeit mediated) way. What seems to be required is a form of *symmetrical* human-animal play design, producing 'true interaction' that is meaningful for both sides, preferably somehow in the same way.

Perhaps surprisingly, two of the most alluring examples of mediated interspecies interaction have involved fish – a clear indication of the potential of technological interfaces to upend common species hierarchies. Ken Rinaldo's *Augmented Fish Reality* is an installation with five robotic fish bowls that allows the strongly territorial Siamese fighting fish to physically traverse a space shared with humans (Sterling 2010; Aloï 2012). The design evokes bodily struggles of Sumo wrestlers, as the fish with the use of their software and hardware extensions may challenge humans by pushing them aside. The *ENKI* experiment set up by Antony Hall provides an even more direct and immersive encounter. A fish tank is prepared with sensors that register the signals sent out by an electrogenic fish and translate these to an audio-visual display. The human engulfed in this virtual/biological reality has his or her bodily responses fed back to the fish in the tank.⁹³ The human is made aware of the fish's bio-electrical field and can attempt to modulate his or her bodily signals in close interaction with a different life form. Whereas the fighting fish installation creates a space for mutual encounter in which human and animal individuals engage in a confrontational struggle for territory, the *ENKI* bio-interface provides an allegedly hallucinating experience in which bodily and mental boundaries dissolve (Hall and Hansen 2010; Aloï 2011). This quite direct and very bodily interface muddles distinctions between interiority and representation, making it much harder to cling to independent and seemingly obvious notions of 'mind' and 'communication'. Hereby the work generates a kind of multispecies

⁹³ See: <http://www.antonyhall.net/ENKItech/introduction.html> (Accessed 12 March, 2014)

interactive experience that moves beyond a sense of two self evidently individualized subjects meeting each other. These two installations each in their own way translate forms of acting, communicating and experiencing of both human and animal to generate a single (or at least overlapping) plane of interaction.

The various examples indicate that we should be aware of how particular designs of interfaces may unduly privilege humans over pigs; and they raise the issue whether there might be ways of meeting each other ‘half way’. Even though pigs are able to use joysticks to control things projected on a screen, as was revealed by Curtis, during design meetings we also discussed a series of alternative interfaces between pigs and humans. Including for instance the *Mud Tub* developed by Tom Gerhardt that allows humans (and potentially animals) to control a computer by immersing their hands or snouts in a tub of mud.⁹⁴ A symmetrical game would not demand of the pigs to adjust to humans. What seems to be required is the design of a *level playing field*, in which humans and animals are to compete (or collaborate) on a par. A play space is to be created in which human abilities are at stake as well, otherwise the set up would be merely another ‘rigged’ IQ test for categorizing pigs as ‘somewhere between dog and ape’, leaving common assumptions about human qualities and moral status intact. As Giovanni Aloï has pointed out, artworks can draw humans into a “zone of inability” and lead us into “an unknown area, an area of animal competence, which automatically appears to be an area of human incompetence” (Aloï 2012, 78). What emerges is a sense of a competition between species from which humans might not walk away as obvious victors. As one of the farmers involved in the project stated during a design workshop:

“Of course humans will beat the pigs in any game. ... Or, well, perhaps we can’t be fully sure, as the pigs do have all day to practice.”

Competitive play is easily understood in terms of a testing and ranking species again though, this time with the assumed status of the human at stake. When imagining great apes to possibly defeat us in a game already is unsettling (Wirman et al. 2011), the thought of being beaten by a pig would for many seem like a complete humiliation. If this happens, will we redefine ‘intelligence’ so that winning a video game no longer counts for much? Would it make humans more humble, no longer assuming we are on top of any imaginable hierarchy? Or would it make us discard

⁹⁴ See for the *Mud Tub* interface by Tom Gerhardt: <http://tomgerhardt.com/mudtub>

the entire idea of moral status based on some hierarchy of intelligence? Ike Kamphof has drawn attention to a potentially even more devastating experience the game may produce: what if the pigs don't like to play with us? (Kamphof 2013).

Defining play for pigs: food reward?

The most extensive and recurring discussions within the design team have been around our choice to abstain from using a food reward to entice the pigs to play our game. Farmers and biologists kept emphasizing to us that the best way to create an interest with the pigs is to offer them food. But the association of food rewards with operant conditioning (and behaviourism) seemed detrimental to our ideal of achieving symmetrical play. Though we might get pigs to do all kinds of tricks, the danger would be that these tricks mean nothing (or something very different) to the animal, and thus would not count as play. Chances are that the animals who behave in ways that appear funny to humans do not get the joke themselves. For them their behaviour might not be playful, but a mere 'mechanical' simulation of playfulness. Instead of promoting interesting interspecies interaction, we might inadvertently be drawn to the ideal of the pioneers of behaviourist animal training: to contribute to turning 'animal psychology into an engineering discipline', geared at 'disciplining black boxes' (Breland and Breland 1961). Digressions of the required behaviour are then taken to be signs of relapse into instinctual 'fixed' behaviour patterns, rather than expressions of meaningful desires of the animal.

Extending our requirement of symmetry, ideally the motivations of human and non-human players should align to the extent that for both sides perhaps the meaning of the game is not fully the same (if that could ever be), but at least that the interaction is playful for both, instead of being easily defined as one playing the other. When the pigs would be solely interested in gaining food rather than being motivated to play, let alone to play with us, this would destroy the sense of playing together. Central in common understandings of what it means to play is for it to be 'intrinsically rewarding'. Play is essentially supposed to be 'fun' (Sutton-Smith 1997, 174). Playing the game should in this view be the sole motivation of the pigs in order for it to be truly play. Even though this ideal of intrinsic appeal as opposed to food rewards has guided our design process so far, discussions on whether this is a necessary requirement for the interaction to be play have been central in our ongoing reflection on the nature of the relation that might be established with a video game.

First of all, numerous animals in captivity have been tested whether they prefer to 'work' for food, rather than just receive it 'for free'. When offered the choice, some opt to perform more elaborate tasks for obtaining food over easy access. This phenomenon of so called 'contra-freeloading' has been explained in terms of intrinsic interest in the activity to receive food, in terms of 'ethological needs' to perform certain natural behaviours, and as a form of information gathering that is integral to the motivations of animals for a range of activities (Shepherdson et al. 1993; Inglis, Forkman, and Lazarus 1997). Pigs too have been found to 'contrafreeload', though the extent to which they do depends on a variety of experimental conditions, whereby more 'natural' foraging tasks appear to work best⁹⁵ (Young and Lawrence 2003; de Jonge et al. 2008).

The idea that a food reward does not necessarily define the character of an activity opens up the possibility that we can both reward and have intrinsically motivated play. In discussions of contra-freeloading this free chosen activity tends to be labelled 'work', whereas we were trying to get our pigs to play. But we could also take the phenomenon as undermining the distinction between 'work' and 'play'. A distinction which seems to be a human obsession anyway, or even the result of a particular definition of play that has been dominant in Western thought since the nineteenth century.

The influential historian of play Huizinga opened up the phenomenon of play to serious reflection by emphasizing its central place in culture.⁹⁶ In his *Homo Ludens*, Huizinga defined play as:

"a free activity standing quite consciously outside 'ordinary' life as being 'not serious' but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it." (Huizinga 1949, 13)

With this, Huizinga adopted the aristocratic norm that 'games are to be played for games' sake', setting play apart from everyday existence (Sutton-Smith 1997, 203). This is a rather restrictive definition, which also makes play a difficult thing to achieve between people and farm animals. Sutton-Smith (1997) has argued how this

⁹⁵ That was according to Breland & Breland (1961) what they relapsed into after being conditioned to gather their food more directly.

⁹⁶ Huizinga assumed culture to be uniquely human. From the fact that animals play he concludes 'play precedes culture'.

idealization of play as unproductive, disinterested and pure, makes it hard to appreciate modes of play that occur throughout everyday human life, also for those not a member of the 'leisure class'. But if then for humans we can broaden our understanding of play to involve non-intrinsic rewards, surely we can do so for animals too? ⁹⁷

On top of this, animals seem to like to achieve things themselves. Another experiment, done with dairy cows, measured the physical and behavioural effects of the experience of problem solving and learning, compared to receiving a food reward without completing a task. Experimental heifers that had just learned to operate an automated fence showed a higher heart rate and more vigorous movement towards the food to which they had gained access themselves than the control heifers who were granted a free pass without any effort (Hagen and Broom 2004). This can be taken to mean that cows have an emotional response not just in anticipation of receiving food and fulfilling their preference, but also from the experience of learning, perhaps even from a sense of achievement. This is another sign that a game might be more than merely 'distracting' animals from what they truly want to do – bite each other's tails, get some food, escape the pen – but that they may experience particular forms of game-play as inherently rewarding and exciting; an experience to which a food reward itself is not central.

Moreover, not all forms of training and operant conditioning that use food rewards necessarily result in asymmetrical power relations and human controlled behaviour. Another interpretation of what happens in learning through positive reinforcement is that this can be a reciprocal activity. When for instance dolphins are trained to go beyond their natural behaviour patterns and invent new tricks, with the dolphins at liberty to initiate their own behaviour, then it can be said "the animal in effect is training the trainer to give fish" (Pryor 1986, 225; cf. Wemelsfelder 1993, 54). Now this alternative interpretation may again be too one sided, this time situating all power and agency on the animal side. Even Haraway admits that agility training with her dog does not occur in some innocent space outside of the asymmetries that abound in human-animal relations (Haraway 2008, 237). But still, some leeway for combining reward and 'genuine' play seems to exist.

⁹⁷ When play is not necessarily opposed to being useful or set apart from everyday life, various ways in which humans and animals closely interact and collaborate (think of guide dogs for instance) are then open to being interpreted as playful (too), rather than as just work.

Do they (need to) know they are playing with us?

In the current prototype, what we offer is not a mutual look, so no true encounter.⁹⁸ There is now nothing on their side of the system that would allow pigs to realize they are playing with, or against, a human. (Or it should be from the way the dot is moved, but that may very well be a too meagre mode of communication.)

In what must be one of the first examples of electronically mediated human-animal play, in the late 1970s a frustrated and overly aggressive Mandrill housed in a zoo in Portland, Oregon was provided with a rudimentary 'computer game'. To diminish the adversarial behaviour of the dominant mandrill, a device was installed that dispensed a small amount of food when the monkey responded faster in pushing a lighted button than either a visitor, or in their absence, the electronic device itself. As that turned out to be quicker than the average visitor, the mandrill developed a preference to play against human opponents. He eventually would stand waiting next to his console on the lookout for new adversaries. Perhaps it was indeed because against humans it was easier to obtain a food reward. Of them he won in two thirds of the cases, especially after a few months of practice (Markowitz et al. 1981; Shepherdson 2003, 50). Or, was the Mandrill keeping an eye on the human players perhaps to enjoy the extra rewarding experience of beating someone else in a game of skill?

Either way, the experience on the human side of playing with pigs can be expected to be rather different if we not just get to have a look at them, but if we exchange a mutual glance. This would be a way to re-establish a visual connection which according to Berger (1980, 28) was the defining character of pre-industrial human-animal relations. Technological mediation may be a way to again encounter the look of an animal. And the gaze of animals directed at us could be highly personal. The look of the pig who is offered a glance at a human would not be a blank stare, as Berger has described the way zoo animals (do not) look at us (Berger 2009). Pigs might actually respond to our face. Other domesticated farm animals such as sheep have been found able not only to recognize photos of up to fifty fellow sheep, even years after they met them, but to recognize particular human faces as well (Kendrick et al. 2001).

⁹⁸ Already a one-way visual connection to animals does generate an ethical space for humans to engage with them, as is apparent in practices around wildlife webcams (Kamphof 2011; 2013). But that particular mode of relating to animals seems predicated on their being wild, and webcams to check in on farm animals are likely to be much less captivating and generative of affect.

An ideal interspecies game in this view would not just realize an exchange of gazes allowing for mutual recognition. Though already an innovative cinematic portrayal of looks between human and animal can “reshape the orders of society and nature” (Burt 2002, 196), making the establishment of a visual connection between farm and home a potentially revolutionary intervention.⁹⁹ Beyond providing the opportunity for a reciprocal gaze, aiming to realize play is even more interesting for several reasons. Not just because of generating experiences of competition or collaboration and allowing for immersive involvement with ‘food animals’, but also for the particular mode of communication genuine play would involve.

Cross-species meta-communication

Play among animals is a very complex mode of interaction. As Gregory Bateson has pointed out, play behaviour involves not just communication, but meta-communication. When he saw two monkeys play-fighting in a zoo, he realised that playing animals continually indicate to each other that acts which performed in isolation would be considered aggressive are in fact meant differently, as play. The phenomenon of play thus “could only occur if the participant organisms were capable of some degree of meta-communication, i.e., of exchanging signals which would carry the message ‘this is play’” (Bateson 2000, 139). Play emerges as deeply paradoxical:

“Not only does the playful nip not denote what would be denoted by the bite for which it stands, but, in addition, the bite itself is fictional. Not only do the playing animals not quite mean what they are saying but, also, they are usually communicating about something which does not exist.” (Bateson 2000, 141)

In practice, the situation of play is labile and liable to break down, as playful acts can always be mistaken for violent ones. But for Bateson, this means play is even more complex, as it centres on the question ‘is this play?’ (cf. Sutton-Smith 1997, 23).

⁹⁹ In contrast, Anat Pick (2011, 160) has a more reserved position on the ethical import of an exchange of looks. For her, attentiveness as a mode of looking does not require reciprocity and recognition, while she envisages ethics outside the “levelling symmetries of visual exchange”, where she expects the absent gaze to “sharpen different sensibilities”. In this way going beyond the “power play of subjectivity and personhood” that demands the other to look at you. Elsewhere, she puts forward certain (cinematic) forms of looking at animals as close to touching them (Pick 2013, 178), a form of contact with a different ethical import. This would make *Pig Chase*, as a combination of both visual contact and (mediated) touch, hold the promise of a new type of mediated ethical experience. This theme will be further explored in the next chapter.

Indeed, the fact that you can never be sure of the nature of the interaction makes entering into a play relationship a matter of trust, and to some extent a risky affair (cf. Haraway 2008, 237–9). Animals are found not only to play with their conspecifics, but sometimes also with others. Thus the complex form of meta-communication associated with play is possible across species barriers – in often even more risky situations. Indeed, *YouTube* abounds with (especially) dogs engaging in play with horses, crows, even fish, including a remarkable case of a tied down sled dog play-fighting with what seems to be a wild and hungry polar bear.¹⁰⁰

By necessarily involving meta-communication, the phenomenon of play could open up the notion of language to gestural forms of interaction, rather than reducing meaningful and complex communication to linguistic exchanges between humans. This offers a way to interpret Wittgenstein's dictum that "If a lion could talk, we would not understand him" (Wittgenstein 2010, 327). According to Vicky Hearne, Wittgenstein, in explaining something about language, makes an interesting mistake about animals:

"The lovely thing about *Wittgenstein's lion* is that Wittgenstein does not leap to say that his lion is languageless, only that he is not talking" (Hearne 2007, 167).

For Hearne, of course some animals do 'talk' to some people. Dogs can even 'read' human intentions and social forms better than we do. And horses and their riders can have complex 'conversations' via bodily touch. In these interactions, an overlap of consciousness of animal and human occurs, in a 'language' not organized by writing and from an understanding of language as more than symbolic functioning or merely pointing at objects. This, Hearne reveals, changes what language is, and what consciousness is.

But is realizing this kind of interactive relation in any way possible in *Pig Chase*? For one thing, a game, by itself, is not the same as play (Haraway 2008, 238). Whereas games tend to be structured, constructed and defined by rules, play involves a more complex relation to rules (Flanagan 2009, 11) and can be a more open type of interaction. But beyond that, to (digitally) convey the subtle ambiguous messages that make for play is an immense challenge. When in our game-design somehow a

¹⁰⁰ See 'Animals at play remake' <https://www.youtube.com/watch?v=K-QBucBINL4> See also: 'Polar bears and dogs playing' <https://www.youtube.com/watch?v=JE-Nyt4Bmi8> and 'grizzly and wolf playing' https://www.youtube.com/watch?v=l49K_9pcln8 (All accessed 12 March, 2014).

far-going type of symmetry and mutuality would be achieved, would it allow for an interspecies version of the 'meta-communication' associated with play behaviour to come into effect?

But is it really play?

The inherent ambiguity of play at least implies that in order to have meaningful playful interaction we don't need to provide guarantees for it to be play, since wondering 'is this play?' is not detrimental but central to the play phenomenon. As long as we can have reasons to suspect it might be play, a well designed *symmetrical* game ideally would allow for this ambiguity to emerge. Interspecies play then promises a mode of doing philosophy in the presence of non-human intelligence that can be traced back to at least Michel de Montaigne and his enigmatic cat (Fudge 2007). In a famous passage in his essays he wonders:

"When I play with my cat, who knows if I am not a pastime to her more than she is to me?" (Montaigne 1958, 331).

Here the question 'is it play' and puzzlement over the nature of interaction gives rise to self doubt. In playing with an animal, also the meaning of human behaviour is unstable and ambiguous. Playing involves putting the self at stake, and by extension the idea of human exceptionalism. This type of questioning of the self was disbanded after Montaigne. Toulmin described the 'shift in the climate of opinion' between the days of Montaigne and Descartes:

"In the 1580s and '90s, skeptical acceptance of ambiguity and a readiness to live with uncertainty were still viable intellectual policies: by 1640, this was no longer the case" (Toulmin 1992, 44; cf. Melehy 2006).

Montaigne did not seek to solve his scepticism in a quest for certainty, a certainty which Descartes would find in his own indubitably thinking ego, but rather to revel in the ambivalent character of encountering an animal. Montaigne's formulation of the relation with his cat seems to assume a zero-sum game, attesting to a suspicion of asymmetry, of being played by his cat. But the fact that one can never be sure about the nature of the play relation is no reason not to take play seriously. Instead, this makes play as a mode of interaction especially suited to explore relations of ambivalence and uncertain communication. In the posthumous, 1595 edition of his Essays, Montaigne had expanded the fragment with a fully symmetrical understanding of play between human and animal, who "entertain each other with reciprocal monkey tricks" (Montaigne 1958, 331; cf. Frampton 2012, 116).

Also for animals themselves, play seems to be predicated on an ideal of symmetry. At least some animals have been found to 'self handicap' in order to become more equal play opponents (Grandin and Johnson 2009, 122; Balcombe 2009). This again is a paradoxical phenomenon. On the one hand it attests to the importance of the issue of winning and losing: if the strongest animals leave no opportunity for the other to 'win', the less strong or able ones would no longer be willing to play with them. At the same time however, this reveals that for these animals play is ultimately not about winning or losing. They apparently are happy to engage in these adversarial modes of play without necessarily trying to 'win'. Play in this way is more about sharing joy than about establishing hierarchies. For animals, play is not so serious an act of self affirmation as seems to be the case in the games and sports that humans tend to formalize amongst themselves.

There is of course a profound tension with the requirement of symmetry and our idea that the game needs to be situated on a farm, considering the essential asymmetry of farming relations (Schicktanz 2006; Miele, Murdoch, and Roe 2005). In the words of CORDIS, the press office of the R&D branch of the European Commission, responding to the *Pig Chase*:

“In psychological terms, the game is an opportunity to learn new things about the cognitive capacities of humans and pigs, and the launch of this game could also help spark debate about animal welfare and humans' role in improving quality of life for animals. However, despite the cooperative nature of the game, we are all aware of the unavoidable elephant in the room, or rather 'on the farm'. In a game where one player is soon likely to be served up onto the other player's plate, the latter player certainly seems to be more equal than the former.” (European Commission: CORDIS 2012)

Does situating play on a farm preclude a playful relation?

7.5 Voluntary and open?

The position of what Natalie Jeremijenko in a reaction to our project called its 'captive audience' (personal communication) is such that a video game may not meet one of the core elements of common definitions of play: for participation to be voluntary (Huizinga 1949, 28; cf. McGonigal 2011, 21). Like symmetry, the requirement of voluntariness seems difficult to meet on an intensive farm. The pigs

having the opportunity to opt out, and preferably go outside and play in the mud, would be a condition for a mutually meaningful play experience. In part we take this issue as a matter of design. For starters, by making sure it is the pig who initiates a play session and terminates it. Thereby the aim is at least not to first and foremost cater to the human need for entertainment, but to that of the pigs.

From our experiences in pig farms, the animals that seem most in need of some distraction are pregnant sows, confined for weeks on end in cramped individual holding pens to prevent them from miscarrying.¹⁰¹ However, with their limited room for manoeuvre, lacking even the possibility to turn around, the danger of being 'forced to play' looms large here. Leaving them for the moment, we instead chose for our prototype to focus on young pigs in group housing. Coming across as impressionable and playful, they seemed a good test panel to explore the possibilities of playing with pigs.

But apart from the issue of confinement, the notion of *voluntary* play easily ignores questions of what it means to be free and autonomous, especially around the elusive phenomenon of play. Gadamer, for instance, has described play as essentially "playing the player" (Gadamer 2010, 108). Players do not relate to play as an object, or an activity they perform, but engage in a to-and-fro, a dialogue or dance in which it is no longer the will of individuals but the dialogue taking over (cf. Bernstein 2011, 121–2). Play, for Gadamer, is an anti-subjective experience, as it draws players into the game, whereby play does not completely exist in the consciousness or behaviour of players. Thus, ontologically, play precedes playing subjects (Gadamer 2010, 115). A 'loss of self' and relinquishing one's independence from the rules and structure of the game seem central to what it means to play. Agency, freedom and will are suspended as part of the game experience, while at the same time paradoxically the space of play can offer a greater freedom than ordinary life (Sutton-Smith 1997, 91).

¹⁰¹ According to Council Directive 2001/88/EC on the protection of pigs, EU pig holdings with 10 gestating sows or more may as of 1 January 2013 no longer permanently house these sows in individual stalls. Instead, gestating sows must be kept in groups from four weeks after insemination until one week before the expected time of farrowing. This of course still means the sows are individually confined for a significant period. On the implications for farmer pig relations of the implementation of this directive see De Krom (forthcoming).

The notion of 'loss of self' in play, however, seems to imply that the self is something owned by an individual before entering into a game. But when people have an urge to play (and thus to lose themselves) this is more complicated. The inner conflict of the desire to play superseding the individual 'rational' will directed at more serious pursuits also may occur when facing an invitation for human-animal play. Electronic messages of pigs wanting to interact may pose a demand on us similar to Montaigne's experience of being summoned to play by his domestic animals, while he "cannot easily refuse my dog when he offers to play with me, even at an inopportune moment" (Montaigne 1958, 318; cf. Frampton 2012, 114–5). In this way sensing 'an urge to play' does not detract from the play experience.¹⁰²

Games undermine simple notions of voluntariness and freedom also in the light of the 'addictiveness' associated with video games; something that, commentators to our project argued, extends to animals.

"Get them addicted to video games so they never want to go outside."
(‘trolley_mctrollenstein’ at boingboing.net).

Whatever might be left of the autonomy and/or natural inclinations of farmed pigs could thus be further compromised by our intervention, especially if conditions are such that there is not much else to do than play our game. Video games, even when successful in gathering prolonged attention of their players, do not necessarily contribute to more interesting behaviour and relations. Just as games designed for humans can be rigid and mind numbing.

FarmVille and the disappearance of the animal in human stereotypy

The web based farm simulation game *FarmVille* is probably the best example of how animals have *disappeared* amidst their overabundance in contemporary visual culture. In this friendly looking game, players are to regularly till their soil, plant crops and buy animals to produce a range of farm products. With the virtual proceeds the players can build and expand their farm and farming operations. Besides providing a daily structure and a sense of making one's fields productive, the game seems implicitly imbued with a traditional farming morality that promotes regular care for your crops and a sense that you need to sow before you can reap.

¹⁰² Montaigne does not specify whether his urge was due to a moral demand by the dog, or a desire intrinsic to the play experience to engage in play with the animal.

FarmVille thereby may come across as a simulation of the daily rhythms and seasonal celebrations of idealized farm life – of feeding and milking, planting and harvesting. But it does so in a strictly predetermined form, without any variation. Each crop is due to be harvested after a set time (usually a few hours, up to a day) requiring the player to regularly return to his or her virtual farm. There is no weather, and no climate. And apart from the occasional sad sight of withered away butternut squash that one has failed to harvest within the set time, this is a fully sanitized version of farm life in which no animal is harmed, no cow is ever culled and the pigs are there only to produce truffles (miraculously without ever having to go into a forest to look for them). Creativity and free expression in the game is reduced to a continual increase in the scale of farm operations and buying things to adorn the barnyard with.

The game's immense success seemed based on instilling an urge to return and perform the required tasks. (This is aside from the social media character of the game, which allows virtual neighbours to treat each other with virtual gifts). Reports of problematic forms of addiction appeared in news blogs at the height of its popularity, when over 70 million people were said to operate a *FarmVille* farm. It has been argued that the game treats its players "like rats in a *Skinner Box*, lulling them into easy stimulation but requiring little creativity" (Jackson 2012). With this game, the cultural process of alienation from rural realities (which are commonly thought of as boring in their own right, thereby granting a sense of realism and authenticity to the arduous task of maintaining a *FarmVille* farm) is turned into a rigid and fixated behavioural pattern that is more akin to compulsively repetitive behaviour than something that could be called 'free play'. Thus, the game comes close to promoting the type of 'stereotypies' by which animals cope with prolonged frustration: a prime indicator of debilitating forms of animal boredom (Wemelsfelder 1993).

Rigidity, stereotypies, or openness?

Some have labelled *Pig Chase* 'real *FarmVille*' (Hsu 2012). In order not to digitally instil behavioural repertoires akin to endlessly pacing up and down, repetitive head swinging, or biting metal bars, the challenge is to design something intrinsically and continually interesting and meaningful on both the human and animal side. Considering the problematic character of the requirement of voluntariness for both pigs and humans, a (somewhat different) way to conceive of 'true play' could be to make sure the play situation is 'open'.

Abnormal behaviour in conditions of confinement can be defined not so much for not occurring in the wild, but for losing its voluntary and flexible character, its diversity and versatility, by becoming increasingly repetitive and fixated in form and function (Wemelsfelder 1999, 47). Besides creating a continually changing game world, another way to deal with this danger could be to design a set up that would allow or even invite other uses than the scripted game-play. So not only is a game not to be conceived as an 'animal IQ test' which the animal can either pass or fail; also the interface should be open to non prescribed behavioural patterns, allowing for modes of interaction of which the meaning and feedback were not laid out in advance. For instance, an earlier game concept based on a more haptic interface would allow humans not just to control a physical ball through a horizontal flexible 'screen', but we imagined that it would also afford humans the opportunity to tickle or massage pigs stretching out on the interface.

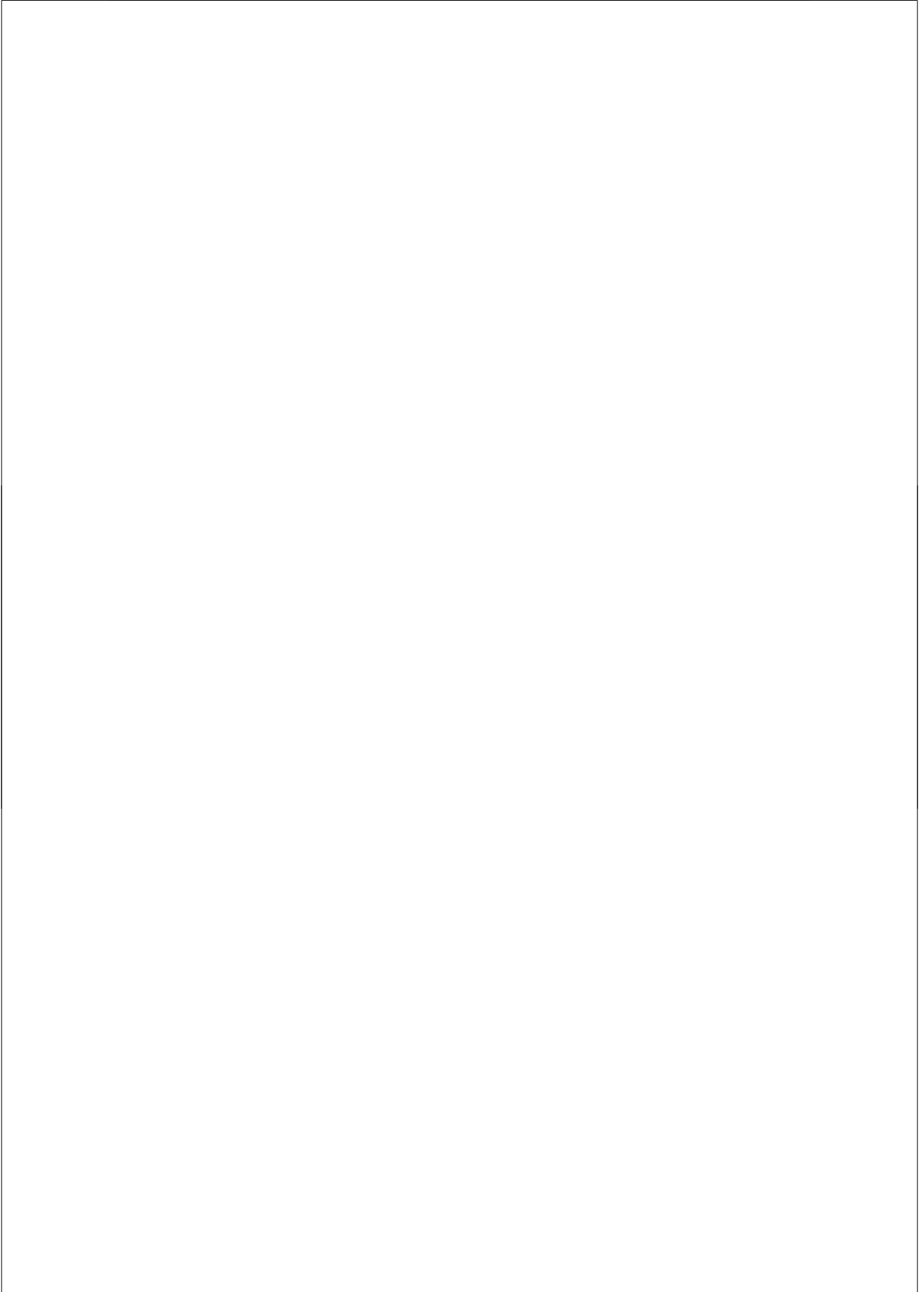
High scores?

(Video) games are often appreciated for absorbing players, providing an immersive experience that involves, as discussed above, a loss of 'self'. Commonly however, video games, before and after the phase of flow and immersion, promote the ordinary idea of self again; for instance in high score tables: the self affirming quantification of abilities and the hierarchical ordering of achievements. Common types of (video) games could be seen as reinvigorating this sense of discrete individuals behaving in response to others and within fixed structures of rules and preset goals. It is not for nothing that most people in the field of game design and research prefer to talk about 'play', an (even) more difficult to define activity, that is more open, experimental and ambiguous. And thus also a term that implies a less prefigured sense of the nature of agency, as not primarily goal directed and self affirming, thinking in terms of winners and losers, etc. The *Pig Chase* concept as portrayed in the short film clip combined elements of both: offering an opportunity for merely moving together, while also providing goals and registering *high scores*. But in this concept these achievements are not necessarily conceived of as the outcome of single player activity.

One of the things that are still open in *Pig Chase* is whether both human and pig, or only the pig, gets to see the 'target triangle'. In that case the human player would need to figure out from the movements of the pig whether these are goal directed and where to try and move together, producing a further need to train human sensibilities for pig intentions. Could this, or the involvement of multiple pig players at the same time, be thought of as precluding the game to 'isolate' individual pigs,

whereas these may also operate in close interaction in a less bound 'ecology of mind'? In the third chapter of this part, I will speculate some more on the possible experience interspecies play may generate.





**The morality of mediated interspecies play:
on designing a moral subject**

8.1 Genres and morality

Cultural genres of expression and entertainment such as literature, film or video games are not just vehicles for certain substantive messages, but can also be found to produce both particular moral subjects and promote certain understandings of mind and subjectivity. What does this mean for what playing with pigs may do to us?

There are indications that video games and their narrative structure may have considerable influence on players' experience and imagination, especially when the game resonates with events or preoccupations in the life of the player. An early case is the psychiatric disorder that was reported in the early 1980s labeled "Space Invaders Obsession" (Ross, Finestone, and Lavin 1982). Early video game theorists Loftus and Loftus drew attention to the import of these findings, and conveniently summarized them:

"The victims of this disorder were men about to be married, and it took the form of a fourfold (or greater) increase in the playing of Space Invaders in the few weeks preceding the marriage. One man even insisted that the honeymoon be postponed for a few hours so that he could get in a few more games. The authors, researchers at the Duke University medical center, asserted that the principal goal of the game –defending a home base against aliens– took on a special symbolic significance in the face of an impending

marriage. (It was also reported that, for whatever reason, game playing dropped dramatically following marriage.)” (Loftus and Loftus 1983, 109).

Interactive media, violence and aggression – of humans and pigs

Many people who respond to our project seem to accept the potential of a video game to reduce aggressive behaviour of pigs. This is interesting, as it is commonly believed that video games for (adolescent) humans instead contribute to violent tendencies. For instance, the contentious 2005 ‘Resolution on Violence in Video Games and Interactive Media’ of the American Psychological Association claimed that:

“there appears to be evidence that exposure to violent media increases feelings of hostility, thoughts about aggression, suspicions about the motives of others, and demonstrates violence as a method to deal with potential conflict situations.” (American Psychological Association 2005, 1)

But perhaps the idea is that if violent games can make people violent, games could also be a force for good, if designed more towards collaboration, mutual identification and thereby instilling a sense of empathy (Coeckelbergh 2007). Some commentaries on our project echoed this idea, thinking of how collaborative rather than competitive game-play would lead to an increase in human benevolence towards pigs. Some have even come to believe that *Pig Chase* would be a way to ‘regain your humanity’ after immersing yourself in violent video games, as one of “ten games to balance out the violence of *Grand Theft Auto 2*” (Carmichael 2013).

Whether this relation between particular game designs and behaviour is so straightforward is far from clear. Although the opposition between collaborative and competitive games often is invested with wider moral and ideological concerns regarding the formation of personal character and social order, the implications beyond the game of engaging in particular forms of play is likely to be much more complicated (cf. Sutton-Smith 1997, 100). Could a violent game perhaps for pigs (too?) be a way to sublimate aggression in stylized and skilful expression in (what also the pigs somehow appreciate as) a virtual realm projected in their space of confinement? Without assuming straightaway that playing games will be actively sought by pigs as an alternative to biting the tails of their pen mates, this is one of the themes that could be interesting to investigate further. Thus turning the

intensive pig farm into an ethology lab for studying the effects of (non-) violent media on 'model animals' whose social structures resemble ours.¹⁰³

For *Pig Chase*, our first prototype, we chose to develop a collaborative game in which human and pig players are to learn to move together and reach goals, in unison. Below we offer a rationale for thinking this may be an interesting form to develop new human-pig relations.

Genres of moral imagination: ways of being subversive, deliberative and empathic?

The pigs in *Pig Chase* are not 'virtual' –mere pixilated representations of pigs– but real. Or, at least there are real pigs behind the somehow represented characters we envisaged humans to engage with on screen. The reality of confined animals actually living in this multiplayer realm makes well worn tropes of game design such as 'game over' rake up a new meaning. The ironic and at most frustrating experience of video game death instantly gets a cynical twist. What would the human experience of playing video games 'do' in this situation? What kind of implications could the genre of interspecies play have on human-animal relations?

The historian Lynn Hunt described the impact of the eighteenth century emergence of the genre of epistolary novels and their ability to produce psychological identification across barriers of sex or class:

“Novels made the point that all people are fundamentally similar because of their inner feelings, and many novels showcased in particular the desire for autonomy. In this way, reading novels created a sense of equality and empathy through passionate involvement in the narrative” (Hunt 2008, 39). She thus claimed, “epistolary novels taught their readers nothing less than a new psychology and in the process laid the foundations for a new social and political order.”

The literary genre of the novel, according to Hunt, helped prepare the ground for a concept such as the universal 'rights of man' and its popular acclaim. Recently, Kidd and Castano (2013) established a neurological basis for this process, as they revealed in experimental tests how reading literary novels increases people's

¹⁰³ It should be noted that contemporary intensive farms do not provide for these social structures, which means, “Ethology on a modern farm only goes so far” (Buller 2013, 162).

abilities to sense what the researchers call the ‘mental states’ of others. This capacity for entertaining a ‘theory of mind’, of seeing from the perspective of another, has been likened to empathy, social perception, and the ability to read body-language.

Extrapolating Hunt’s historical thesis and Kidd and Castano’s findings, what moral and political innovation might be in store in the wake of the genre of video games, and its extension to multispecies interactive play? Even though games may have a narrative structure too, the effects on us of sharing this genre of expression and entertainment with animals might not involve the kind of imaginative identification by absorption in a narrative. Whereas through reading novels we may start to imagine that other humans have ‘inner lives’ just like ourselves, with animals this tends to be considered as much more problematic.

8.2 Moving beyond the empathic subject and its perspectival mind

As Thomas Nagel has argued, even though we may acknowledge that indeed non-human animals have subjective experiences –there is something that it is like to be, say, a bat– a species barrier is thought to exist beyond which we can never know exactly ‘what it is like’ to be another animal (Nagel 1974). For an analytical philosopher such as Nagel this was a thought-exercise to make a point on the age old ‘mind/body problem’, as well as the philosophical issue of the existence of ‘other minds’ and the impossibility of objectively finding out what might be in them. Nagel meant to oppose the physical reductionism that presumed that things which cannot be objectively observed do not exist. However, the upshot of his view is that animals are granted a mind and subjective experiences, but in the same move these get to be defined as fundamentally ‘inaccessible’.¹⁰⁴

¹⁰⁴ Nagel’s bat did inspire Donald Griffin, a pioneer of ‘cognitive ethology’ to (starting in the 1970s) boldly postulate animal mental interiority (Allen and Bekoff 1999, 142). In a series of increasingly daring books he argued for the acknowledgement of a subjective world of animals: from ‘the question of animal awareness’ (Griffin 1976), to ‘animal thinking’ (1984), and ‘animal minds’ (1994) culminating in ‘animal minds: beyond cognition to consciousness’ (2001). According to Bernard Rollin, Griffin’s pioneering claim that animals have a mind was not based on any new scientific evidence, but consisted of a coherent presentation of existing

But the stubborn quest of gaining access to something that is defined as inaccessible –a particular ‘inner’ and individualist mind– is bound to fail within the paradigm of objective observation that further entrenches a strict subject/object dichotomy. Thereby these efforts seem to only reinforce the (classical) behaviourist distinction between a subjective mental realm and objective material world, with only the latter a proper area of scientific observation and scholarly debate (Bekoff and Jamieson 1996, 76n4; 346). But how are we then to conceive of minds, subjects, and, in relation to these, morality? What happens if we focus on different cultural genres than the novel?

The conception of subjectivity as some kind of inner voice reflecting on outward experiences, which according to Hunt was promoted by the new genre of the eighteenth century novel, could be just one way of understanding who and what we are and how we relate to others. There may very well be other ways to conceive of minds and subjects, and thereby other forms of crafting moral beings and relations, besides the type of explicated emotional interiority that eighteenth century novel readers started to train themselves to experience and imagine in others.

Film and animal subjects

By the end of the nineteenth and start of the twentieth century, photography and film can be seen to change the status of the animal and the character of both human and animal subjectivity, which became centred around seeing (Burt 2002, 35). Depending on the positioning of cameras, films may provide either a form of situated vision or generate some kind of all-seeing gaze (cf. Wolfe 2003, 3–4). Burt argues that even though imagery did bring a focus on the ‘interiority of a seeing subject’, it did so through an emphasis on external, visible features, shifting attention from issues of subjectivity to those of agency (Burt 2002, 38). Against Berger, who only discerns ‘blank stares’ of modern animals, he points to the cinematic focus on the animal eye and the (albeit elusive) aim of a shared look between human and animal individuals.

Film and cinematographic techniques such as the close-up indeed help us realize that inner emotions can be interpreted or shared by reading faces and movements of actors. With animals however, this seems already more difficult to realize in the span of a film; in any case, animals often are cinematically portrayed in a way that

findings in the light of the common sense assumption that animals are conscious living beings (Rollin 1998, 252–3).

does not promote identification. Even though recognizing various animals as having a face comes easy to us (Buller 2013), fostering the human ability to read animal facial expressions and body language seems to require more prolonged interaction, ideally involving a bodily presence among (groups of) animals. Then the question is whether the experiences of extensive bouts of field ethology, or of intimately living with animals on a (premodern) farm, can be reproduced by some form of mediated interaction.

The moral character of digital play

Are computer games in turn becoming what once literary fiction and more recently film were: the central mode of experiencing and interpreting the world, others, and the self? The newly emerging cultural genre of digitally mediated play could, as it grows increasingly dominant, likewise give rise to both a new social order and a fresh understanding of subjectivity of both humans and animals. Novels are broadly appreciated as mentally liberating and, like other forms of high art, to disclose our world anew. And (at least certain types of) film have also come to be thought of as a prime cultural genre with the power to address societal issues and raise public awareness. In contrast, video games are often considered to be trivial, nothing more than mind numbing entertainment. Indeed, while granting a superficial impression of behaving actively, a gamer may find him- or herself stuck in the mould of preset roles such as the 'first person shooter', with little opportunity for genuine self expression, experimentation and learning. As a cultural form geared more to distraction than liberation, the common type of subjectivity produced by main stream video games seems to be rather quaint, as we saw with *FarmVille* in the previous chapter.

But like other cultural genres, 'games' is a very broad category and digital games come in many genres and shapes. Games and literature moreover are not to be thought of as opposing categories defined in terms of simple dichotomies such as active and passive: Reading a novel requires actively imagining rather than mere passive undergoing. Games may contain narratives and can be closely scripted, while literature and poetry can be playful (Sutton-Smith 1997, 137) and may involve 'language games' and 'word play' (Flanagan 2009, 137).

Notwithstanding these difficulties in defining both games and literature, there are some differences between the moral worlds emergent from games and from novels. In general, the main difference seems to be that with (video) games the player is actively and physically involved in the action, and thereby (at least in part) in

propelling the narrative. This produces an experience of back and forth, of fine-tuning one's behaviour in relation to an environment.

A multiplayer game moreover can generate the direct experience of relating to others, making the emotional investment and potential for intimacy that some forms of mediated play afford very different from the solitary and 'inner' experience of reading. And, of interest for our purposes, as opposed to the reading of novels, playing (at least some kinds of) video games is something that both humans and a host of other animals could actively take part in. What are the implications of this for possible conceptions of minds and ways in which these are thought to interrelate?

Non-perspectival subjects

Lorraine Daston may offer a route towards alternative modes of relating to non-human others that fits in with multiplayer game experiences. Daston (2005, 40) contests Nagel's collusion of mind and subjectivity which assumes that the answer to the 'what it's like to be ...' question is about 'conscious mental states' and 'the subjective character of experience', which needs to be imagined in a 'perspectival mode'.

"The language of perspective carries with it weighty assumptions about what it means to understand other minds. Within the model of a world divided up into the objective and the subjective, and armed with the method of sympathetic projection, understanding another mind could only mean seeing with another's eyes (or smelling with another's nose or hearing with another's sonar, depending on the species)—"put yourself in his place"" (Daston and Mitman 2005, 52).

She offers a tentative list of the various intellectual and cultural shifts that created the perspectival mode and the associated form of individualized experience:

"the habits of interior observation cultivated by certain forms of piety; the increasingly refined language of individual subjectivity developed in the eighteenth- and nineteenth-century novel; the equation drawn between sensory experience and self by sensationalist psychology; political and economic individualism; the cult of sympathy, which expanded to embrace first children, then animals, and finally denizens of other times and places. Whatever the historical forces that forged it, the perspectival mode was most decidedly a creature of history. It is not simply another form of

subjectivity; it is the apotheosis of subjectivity as the essence of mind.” (Daston and Mitman 2005, 52).

Different ideas of subjectivity and associated modes of relating to others, and especially to animals, open up when we look at immersive and direct forms of interaction. Vinciane Despret has drawn attention to the implications of human and animal bodies moving together, with regard to our understanding of both mind and empathy. Discussing the ‘isopraxis’ phenomenon in horse riding she explains:

“talented riders behave and move like horses. They have learned to act in a horse-like fashion, which may explain how horses can become so well attuned to their human riders, and how mere thought from one may simultaneously induce the other to move. Human bodies have been transformed by and into a horse’s body. [...] Who influences and who is influenced, in this story, are questions that can no longer receive a clear answer. Both, human and horse, are cause and effect of each other’s movements. Both induce and are induced, affect and are affected. Both embody each other’s mind.” (Despret 2004, 115)

Despret conceives of the close bodily interaction between humans and animals as generative of a kind of empathy that can also be made productive within scientific research. Discussing the various ways in which researchers of animal behaviour can be bodily present in relation to the animals they study, she promotes the idea of empathy that allows for embodied forms of communication:

“a concept which describes feeling/seeing/thinking bodies that undo and redo each other, reciprocally though not symmetrically, as partial perspectives that attune themselves to each other. Therefore, empathy is not experiencing with one’s own body what the other experiences, but rather creating the possibilities of an embodied communication.” (Despret 2013, 51)

Sympathy vs empathy

With Van der Weele (2011) we could argue that the type of ethical relation fitting with the experience of isopraxis is not empathy, as Despret proposed, but sympathy. The kind of moral subject this implies is not a pure, disinterested, altruistic

individual that leaves the self behind while taking the perspective of the other.¹⁰⁵ Empathy in this view is not the (only) appropriate ideal of moral imagination and experience. The idea of individual subjects getting into the minds of others, that we should 'feel our way into' another being, assumes we are 'outside' to begin with. As Simon James in regard to his dog summarizes this (Heideggerian) critique:

"There is no question of me proving that she is a minded other, rather than a mere thing, since her being a genuine other to whom I am related is presupposed in a rigorous account of my being-in-the-world." (James 2009, 40)

8.3 Genres, ethics, subjects, experience, minds and science: a co-evolutionary ecology?

In our search for meaningful modes of interacting with animals, we have been looking for ways to go beyond thinking of animal (and human) minds as inner, mental, and inaccessible to scientific research. As opposed to studying mind as a matter of (somehow indirectly) gaining access to something interior (Laurier, Maze, and Lundin 2006), in alternative conceptions of minds these can be studied in complex environments during rich modes of interaction. There, minds appear as enacted and emergent, as part of ecologies, processes, or networks of relations, rather than as individualized sites of 'cognition'.

What form of ethics and moral subjectivity does this relational and process understanding of mind generate? With our game project, and the ensuing reflections on its potential for new ethical relations with minded beings, we seem to get caught up in a tension: Between on the one hand an ethical ideal of interspecies communication based on experiencing the self and animal others as individual subjects.¹⁰⁶ And on the other hand an ontological commitment that envisages minds beyond individual humans and animals, to the point of dissolving all in a single

¹⁰⁵ Whereas empathy is often deemed to be a basically passive and spontaneous event of selfless feeling, sympathy includes a more active and contemplative element, in which the self is also present somehow, though not independently from the other. This seems to be a more interesting way to understand what happens with idiosyncratic and ambivalent subjects in moments of affective encounter.

¹⁰⁶ Perhaps even the 'subjects-of-a-life' as defined by Regan (2004)

muddle of boundless bodies and extended minds. These are the two options that appear to be on offer: Go with the ‘liberals’ to discern individuals that are to be granted moral status, but thereby fall into the trap of idealizing isolated minds. Thus making animals come across as deficient humans, precluding an appreciation of what is wondrous about animals and our relations with them. Or we could side with the ‘post-humanists’, and promote an ethics of immersion and individual dissolution, but thereby risk losing a sense of responsibility or even agency and subjectivity.¹⁰⁷ *Pig Chase* seems to alternate between these modes of interacting: at first the game offers an interface to learn to move together without set goals. These appear only after a while, whereas at the end also (high) scores are kept track of, pinpointing the abilities of human players (or perhaps human-pig teams?)

Another way of understanding this tension is to consider it as two different ways of experiencing or being in the world: either in a state of flow, of skilful, everyday behaviour that involves full immersion in a situation, without actively ‘representing’ that situation and our goals of action in them; or, when this state of flow breaks down, and we are forced out of our thoughtless habitual practices to then enter into a subject/object relation to the world (Dreyfus 1993).

This opposition, between detached reflection and full immersion, aligns with two models of morally engaging with a situation. Berger’s ideal type of being ethical in relation to pigs was the immersive peasant, whose skilful sensorimotor movements lend legitimacy to the act of killing and using animals. This peasant does encounter these animals, but precisely by living a ‘parallel life’ filled with mundane functional acts. Since immersion and flow are often considered prime characteristics of (video) game experience, digital play might be conducive to modes of attunement through which gamers would resemble peasants. At the same time, also with Berger there is a tension between immersion and individuation, between dissolving selves and individuating encounters. Berger however considers these as stages in a historical process: “man becomes aware of himself returning the look” (Berger 1980, 5). After this primordial human individuation, a mutual look goes across an ‘abyss’, which is only between two humans ‘in principle, bridged by language’. The absence of animal linguistic capacities is the dividing feature for Berger, leading him to state: “no animal confirms man, either positively or negatively” (1980, 5). However, the

¹⁰⁷ This opposition is to some extent akin to the one discussed by Buller (2013) between relating to animals as individuals and as mass (herd, flock, etc.), but differs as dissolution and individuation in the way discussed here both can occur in relations with an individual animal.

'unspeaking companionship' (1980, 6) that animals offer to humans, allows us to lead parallel lives that can be experienced as so equal in nature that "often one finds the conviction that it was man who lacked the capacity to speak with animals" (1980, 6).

Individuation or immersion: touching or being touched?

Also Wemelsfelder exemplifies the same tension, between individuation and immersion, when she argues for developing phenomenological forms of empirical research into the subjective experience of animals (Wemelsfelder 1999). Against looking for causal mechanisms in which a stimulus causes a response, she stresses the existential relation between organism and environment, where movement of a body and perception of its environment are indistinguishable. In this way, there are no separate internal and external factors, and 'interaction' is itself a causal principle (Wemelsfelder 1993, 61). At the same time, in trying to overcome mechanistic modes of behavioural causation, Wemelsfelder draws attention to individuating experiences of organisms in spontaneous interaction with their environment in which a moving body recognizes itself as initiator of change (Wemelsfelder 1993, 62). After biologist and phenomenologist Buytendijk, she emphasizes spontaneous and variable behaviour, such as hesitation and surprise. In different contexts, particular stimuli were found to acquire different meanings for the animals, from which Buytendijk concluded that animals experience their environment as a meaningful whole and not as a concoction of isolated stimuli (Buytendijk 1953). He had found that an octopus experiences the difference between touching and being touched. Thus animals relate to their body as being their own, that they can move, rather than only automatically responding to stimuli (Buytendijk 1953; Wemelsfelder 1993, 63). In this way the understanding of individuals can be thought to overcome the stimulus/response thinking based on inner/outer, bodily/mental dualisms which Dewey already dismissed in his influential 1896 article on the 'The Reflex Arc Concept in Psychology' (Dewey 1896). Dewey proposed an ontological unity of acts and experience that is both active and passive at same time, involving both doing and undergoing, which are conceptually not to be distinguished.

Wemelsfelder draws on Buytendijk to posit the existence of independent non-human minds, granting animals spontaneous self-originated behaviour, rather than observing mere stimulus-response mechanisms. Does this however involve a distinction between subjects and agents, between beings whose behaviour is not performed by an agent, but which 'happens to it'? This view of agency, according to

Despret, “seems to be still entangled in the classic understanding of agency as intentional, rational, and premeditated” (2013, 33).

“Does agency rest upon the contrast between moving oneself and being moved? Between acting and being acted upon, between acting and reacting?” (Despret 2013, 37).

With Deleuze and Latour, Despret resists the overly individual and straightforward understanding of subjective experience and intentional agency: “Each living being renders other creatures capable (of affecting and of being affected), and they are entangled in a myriad of rapports of forces, all which are *“agencements.”* (2013, 37). This is a view of agency as an always unfinished “active process of attunement” (2013, 38).

“As there is no way to touch without being touched, there is no way to determine who touches whom. Touching enacts a desubjectification” (2013, 39).

The two models of relating to minded others thus appear to come down to the issue of whether we should seek to distinguish between touching and being touched as the hallmark of independent subjectivity, or whether we should stick to a desubjectification, whereby this distinction is no longer meaningful.

Subjecting ourselves to design experiments: on (not) deciding whether we touch or are being touched

How to fully resolve this tension outlined above is beyond the scope of this chapter. It seems appealing though to seek ways to move beyond this dichotomy. A pragmatic way to deal with the set of oppositions we are caught up in here would be to try and overcome the basic dualisms that are implied: of an ethics (and epistemology) of distance vs immersion, of abstract vs situated thought, of reason vs embodiment. Then we perhaps find that immersion and distance may not be the only options, nor the only ‘poles’ in between which an answer needs to be sought and forms of ethics and minds are to be imagined. Perhaps we could retrace the experience of Montaigne: a questioning of the self, but not directly to muddle everything. This also means the whole issue may not even be something that needs to be solved or dealt with through philosophical reasoning.

Indeed, we do not need to decide here. Delving into possible distinctions and understandings of what could happen between us and pigs is what we can explore in actually designing and tinkering with mediated relations with pigs. We could seek to make a situation in which new conceptions of minds and moral experience in relation to others may co-evolve with mediated human-pig relations. The above set of questions can then be researched by generating new environments in which to experiment with modes of both individuating as well as extending minds.

Games seem especially generative of the kind of bodily and mental immersion in an environment, but they often do so in a way that promotes an experience of domination. At first sight *Pig Chase* may seem to allow human players to steer the movement of pig participants, affirming human mastery and control. But, in fact, the game concept requires human players to stay in touch with the nose of the pig. This means that in order to play, both would need to learn to move like and with the other. Who leads and who follows, who touches and who is being touched, is ambiguous in this situation.

Will this generate the kind of isopraxis outlined by Despret? Will the experience of this artificial environment amount to being a 'meaningful whole' to the pigs, rather than just a series of isolated stimuli to which they are made to respond? Would this be a way of connecting minds in an immersive shared activity that muddles assumptions of individualism, while at the same time individuating both players? Can we have both the individuating experience and a sharing of minds?

Whereas reading novels (and watching films) provide a form of individuating minds that allowed for empathic projection into imaginary others, multiplayer interaction is a staged encounter with an actual other, which may produce sympathy by moving together, promoting a form of emergent moral subjectivity that does not involve leaving the self behind for an ideal of altruistic empathy. In this way (for humans) play is then not so much a loss of self – which would imply the self was something previously had, possessed, only left behind when starting to play. But play (also) allows for particular selves to emerge, to be experimented with, and to cultivate an experience of oneself as a specific, peculiar self.¹⁰⁸

¹⁰⁸ An emphasis on creating environments and situations for moral subjects to emerge fits in with a Deweyan, pragmatist approach to ethics, in which moral responsibility is thought of to consist in actively seeking environments that will induce us to become particular 'good' persons. There is no escape from the circularity of somehow deciding what kind of person to become, in seeking out particular environments in which to

The challenge is to design this ambivalence, the experience of being an individual who encounters minded others and of becoming a single being, skilfully moving together. This experience, of doubt regarding who moves who, seems to be a kind of individuation of organisms that does not lift them fully out of their environment. Then there is no need to decide on the ontological primacy of either isolated individuals or relational beings. The aim of our design would be to create the Montaignean limbo, the vague sense that we may be mutually fooling each other; a kind of meta-level reciprocity in which both human and pig are dimly aware of not being fully in control, but (also) being moved. Like play, touching and being touched is not a zero sum game. That difference may be something that we can only experience in contrast. This would mean the tension we described should not be taken as an absolute opposition, nor even as alternating phases. It seems likely that we can only experience the difference between touching and being touched when both occur as part of a single process. If this is the case, then one can only become an individual, experience oneself, in close relation to others – which are not necessarily humans.

8.4 Playing with pigs for a new multispecies community

Of course it is not such a spectacular idea that playing with pigs may complicate us eating them. On the other hand, the ideal of Berger's premodern peasant, who cares for his pig and eats it too, has been found to gain ground over the last few years again. Especially with somewhat postmodern urbanites in search of authentic forms of relating to meat consumption, such as by hand raising and killing their own food animals (Parry 2009). So what kinds of effects may playing with pigs have? Via the theoretical excursions above, we now have gathered some fresh ideas regarding the question what playing with pigs may do to us. So far the term 'us' we have used to either indicate 'us, the authors', or at other points 'us humans, as opposed to

experience moral concerns. If this process involves moral subjects actively 'working on themselves', this can be seen as a continuation of a Foucauldian genealogy of the moral subject (Foucault 1988). This 'later' Foucault understands ethics "as the active engagement of people with governing and fashioning their own way of being in relation to conditioning circumstances" (Dorrestijn 2012). As Jane Bennett (2001, 145) described, the care of the self for Foucault is an inherently ambiguous process, in which it is unclear who it is that deploys techniques of transforming themselves into becoming subjects.

animals'. But trying to play together may generate a different us, a new multispecies community.

Field primatologist Barbara Smuts describes in her 'encounters with animal minds' how sharing in the activities of a group of wild baboons for an extensive period shifted the nature of her subjective experience:

"Increasingly, my subjective consciousness seemed to merge with the group-mind of the baboons. Although 'I' was still present, much of my experience overlapped with this larger feeling entity. Increasingly, the troop felt like 'us' rather than 'them'." (2001, 299)

Smuts does not fully relinquish her individuality, but by entering into shared spaces with humility and sensitivity she has trained herself to experience a variety of animal others (baboons, dogs) as unique individuals that one can strike up personal relations with. The first step for this to occur with the baboons she studied was for them to recognize her as a subject and not an object (whereas she pretended to be one in an early attempt to be a properly disengaged scientific observer). The ultimate experience of an interspecies relationship she envisages to result from a profound degree of intimacy in which at moments it seems as if subjective identities of human and animal merge into a single being or single awareness.

Can this type of intimacy be achieved also with clever non-primates such as pigs? Dutch biologist Gerrit van Putten, who in the 1970s was a maverick civil servant and pioneering pig behaviour researcher, claimed that after spending years amidst pigs he was able to discern 40 different types of grunting sounds, each with a particular meaning. As an alternative to teaching pigs American Sign Language, learning about pig minds might be merely a matter of enabling humans to spend time with pigs. But the potential quality of this time during digital play is still uncertain. The figure of the bodily present field primatologist that becomes part of a wild animal community is difficult to emulate online. And also the situated experience of the skilful, craft like activity of the farmer is hard to produce via digitally mediated interaction.

Disgusting and perverse? On producing an edible community

"how horrifying – giving these poor animals a stupid GAME to keep them "entertained" until they are slaughtered!!! this is sick and disgusting!! hey, here's a better idea – how about NOT EATING THESE POOR ANIMALS SO

THEY DON'T HAVE TO SLAUGHTERED FOR HUMAN CONSUMPTION!!! what the hell is wrong with people, does it ease their conscience knowing that their food can be entertained before being consumed??? barbarically disgusting!!!" (Terri B, at 'care2.com')

"humans are perverse." (Emma D, at 'care2.com')

With our game we ultimately try to realize a kind of symmetrical relation and promote people to engage in meta-communicative exchanges, signalling to the animals to trust us, indicating we intend to play (Bateson 2000). In this way we hope to generate a shared activity that could eventually even lead to a sense of intimacy between human and pig. This might be what prompted several people to call our project disgusting and perverse. We could of course self-righteously point to the presumed moral inconsistency of many critical commentators who may have no qualms about eating animals they haven't met. But, still, even if these people are not vegetarians, there might be something to their critique. Perhaps our proposal to play with pigs is reminiscent of a cat 'playing' with the mouse she has caught. From the outset it is clear to humans that the meta-communicative signals that we may be able to transmit –'this is not serious, we just want to play'– will eventually be betrayed. Humans and pigs playing together can be merely a way to meet the EU regulations on pig production; to optimize pig behaviour in conditions of confinement. That would not just betray our previous signalling 'this is play', but thereby also undermine the phenomenon of play itself and its communal and identity forming role. As Huizinga has put forward, play is a ritual for establishing and consolidating community membership, akin to dance and other communal celebrations:

"[A] play-community generally tends to become permanent even after the game is over. Of course, not every game of marbles or every bridge-party leads to the founding of a club. But the feeling of being "apart together" in an exceptional situation, of sharing something important, of mutually withdrawing from the rest of the world and rejecting the usual norms, retains its magic beyond the duration of the individual game." (1949, 12).

By choreographing pigs destined for slaughter and their consumers to move together in what Huizinga called 'the magic circle', the potentially sacred and ritual character of play is turned into a cynical joke when the pig reaches its slaughter

weight and goes on to be industrially processed as part of a system that is designed to be utterly devoid of sacredness and ritual.

Carol Adams (2004) has argued that meat eating resembles pornography: for humans to enjoy the objects of consumption these are not to be thought of as subjects. Playing a game with future objects of meat then either involves the denial of the eventual prospects of the playmates, or the enjoyment of a perverse pleasure in consuming actual others. Is it perverse to actually seek to relate to the consumed other as a subject, or would that be more wholesome than letting them disappear into the animal industrial complex? Berger's ideal of meeting the gaze of the animal consumed by the peasant seems to suggest the latter. But the question remains whether this experience can be had through digital media and supermarkets. Occasionally, in discussing the project, we proposed to use the system of tracking and tracing of meat products to print a pig's 'high scores' on the packaging, thus individualizing the meat and connecting it to a playful and skilful mind that it once embodied.

Conclusion: a project that critiques itself?

Apart from numerous eager players inquiring where and when they could download the app, we also saw a large variety of critical responses to the project and the *Pig Chase* design concept we proposed. Is a game normalizing, or even ridiculing the plight of intensively raised pigs? Is it indeed 'disgusting' and 'perverse'?

We can agree with many of our commentators that the project is deeply and inherently problematic. After all, it was meant to somehow subvert and unsettle existing practices. At the same time its relation to these practices is unclear, as to some extent a game might merely promote the status quo of pig production while giving the superficial impression that things are improving. One could say it is just a way to evade moral questions and direct the eye away from suffering and killing. However, the radical extrapolation of the requirement for pigpen enrichment I feel implies a clear message that things need to improve much more than is commonly envisaged. Without presenting a clear cut program defining in what way (if ever) the pig industry will be acceptable, or even good, I do believe that the kinds of experiences and discussions raised and framed by our project can be a good way to help rethink pig farming.

Also in the light of the critiques vented towards *Pig Chase*, I would argue that creating interesting and worthwhile pig-human interaction is at least in part a

design challenge. Is this a rather overambitious project? The list of aims in the light of ideal modes of human-animal encounter expounded in the previous chapter clearly overburdens our still modest efforts at realizing something that will actually allow some kind of mutually interesting interaction between bored pigs and humans. The prototype game presented in our concept video does not meet many of our own emerging criteria just yet, as some commentators have pointed out in response to our statement that the game would ‘allow humans and pigs to experience each other’s cognitive abilities’:

“I’m not sure how this game helps pigs to “experience the cognitive capabilities” of humans. They don’t see their playmate. More likely this game, which they will sometimes fail for no apparent reason (caused by their unseen partner failing), will, according to BF Skinner’s experiments on ‘magical thinking’, encourage the pigs in faulty post-hoc thinking and developing superstitions such as wearing lucky pants, always dancing on their right legs before a game or using homeopathic steroids. Then they’ll be indistinguishable from humans... No piggy deserves that fate.” (Herm Baskerville, at vimeo.com/29046176)

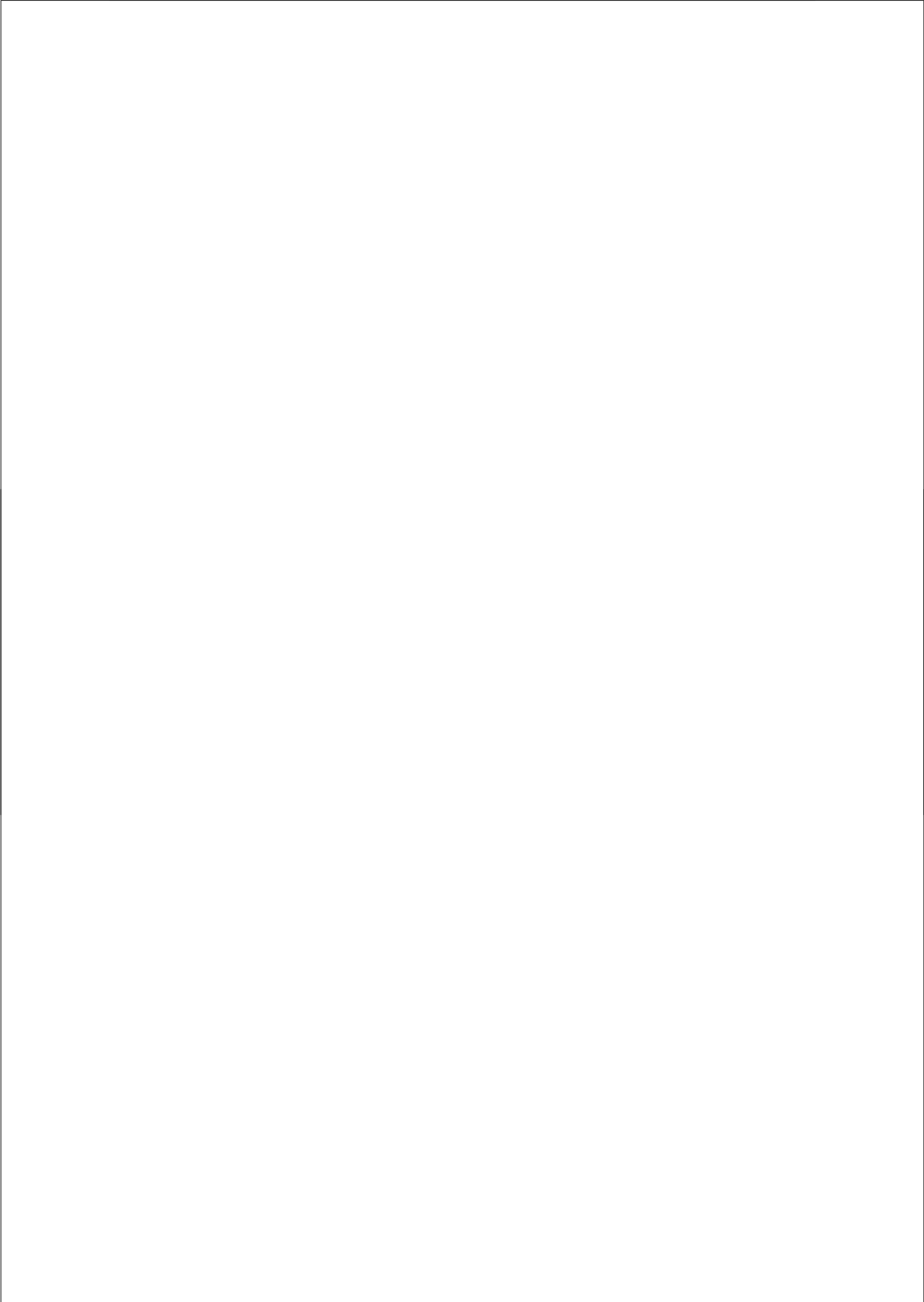
The major danger of achieving some form of playing with pigs is that it would perfect their exploitation. It could provide yet another way to dominate and control animals, rendering productive on an industrial scale the only ‘part’ of the pig that was not yet used: their mind. A mind which thereby would be individualized and isolated again, turned into a ‘cut’ just like the rest of their body. The outcome of playing with pigs on a massive scale will not necessarily be benign. Perhaps those that protest against it for being perverse and disgusting are on to something: when people would actually, perhaps after a few qualms, decide they can enjoy playing with minded others and then go on to eat them. Sticking instead to the contemporary zoning of moral relations with a strict partitioning of ‘those we love, those we hate and those we eat’ (cf. Herzog 2011) might be sensible after all.

In the Netherlands, about 15 million pigs live on intensive farms, almost as much as human inhabitants. Full implementation of digitally mediated pigpen enrichment would require each of us to spend a portion of the day on distracting a bored pig. Or is in this way play –the final vestige of spontaneous and autonomous behaviour of both humans and animals– rendered productive and taken up into an all encompassing industrial food system? One could wonder why we should try to create this *gamification* of human pig relations. We have not given a formal

justification of our duties or the rights of pigs to play. By taking this as self-evident, we evaded formal ethical arguments to justify particular ways of treating animals. Instead, we are hoping to create a situation in which people may experience for themselves (in a particularly mediated relation to non-human others) whether they think providing more interesting lives for pigs is an important thing to do.

With the progress on our prototype going slow and various major design challenges still to overcome, the road ahead for this project is uncertain. Our ultimate challenge will be to realize a true form of deliberative play design, by providing an open source platform for people (together with animals, and farmers) to try out new modes of interaction to entice pigs to play. This would be one way of starting to share our material culture, bringing animals (back) into our otherwise all-too-human community. But as we have seen, already the design efforts worked as a conversation piece for a wide array of commentators. Are there ways to continue our project that would allow us to appropriate the various critiques vented against our game – as part of the intervention to instil debate on pig production practices on a new footing?

“This is the stupidest f[uck]ing shit I have ever seen. SERIOUSLY. What the f[uck] is wrong with you humans? You should be f[uck]ing ashamed of yourselves. I can only hope that you are one day caged with this "game" for others to play so you too can have an "entertaining" and "fulfilling" life before you are consumed by the masses.” (F[uck]thepigchasegame, at ‘treehugger.com’)

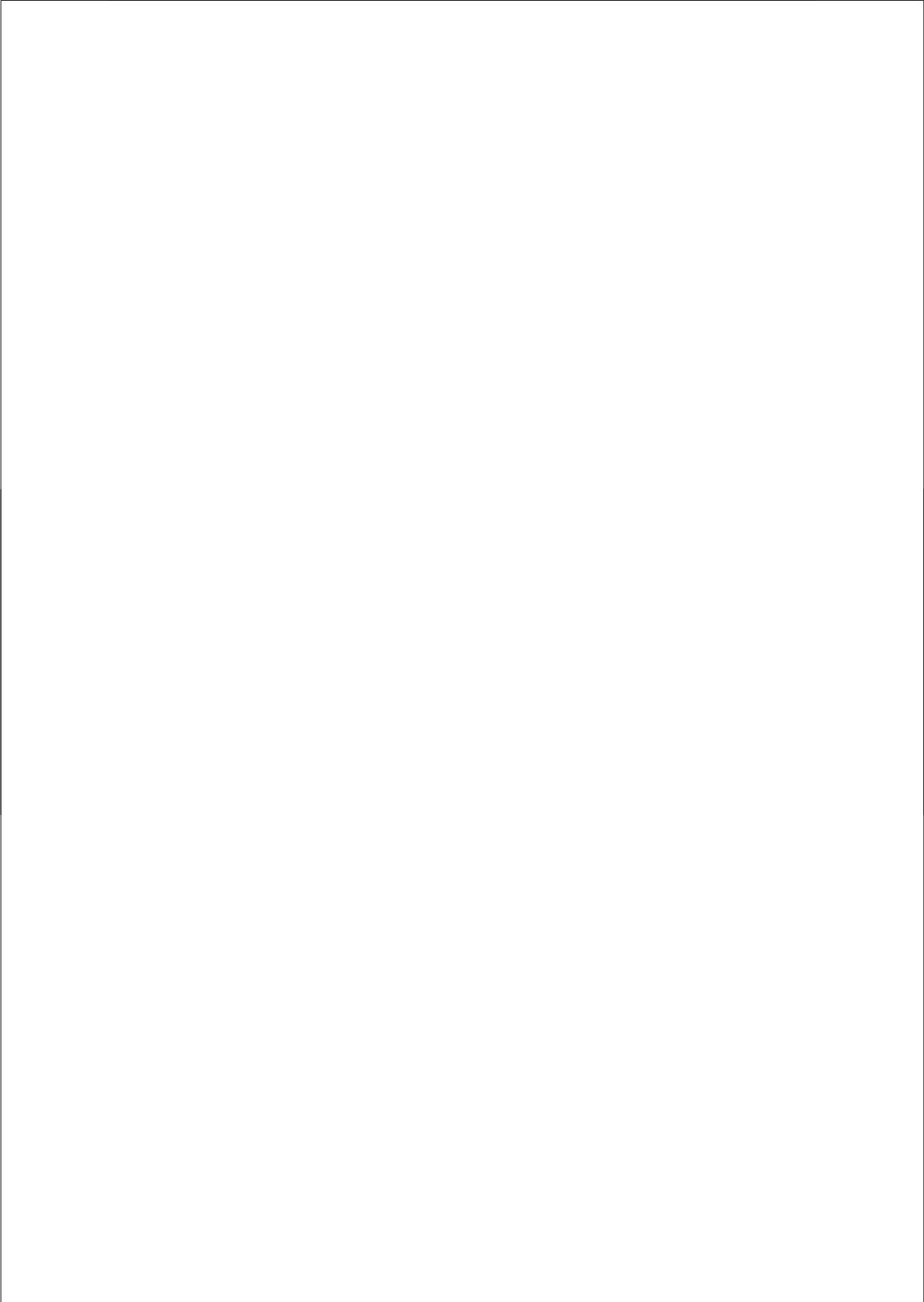


Part IV

Conclusion

This final part explicates the struggle to conclude a written thesis in philosophy that actually 'wants' to be something else. How to deal with the paradox of arguing for alternative modes of engaging with ethics while still being stuck in the particular justificatory style of academic prose? How to write a conclusion that wants to say ethics should be done out there on farms and via material tinkering rather than writing long winding jargon filled texts?

After mulling this question over in chapter 9, the thesis is concluded in chapter 10 by tracing the ways in which the previous chapters informed and offer a particular take on the Playing with Pigs design project, which is proposed as the 'true' conclusion of the thesis. Eventually, in the epilogue, we move back to the farm that we started out on.



Show, don't tell? The conclusion of this thesis is not (just) a text

Conclusion

This thesis so far has presented a series of attempts to explore a variety of alternative genres of ethics, such as ethnography, case studies, photomontage and game design. Ethics is the thorough and systematic –or rather the meaningful and imaginative, or maybe disruptive and irritating– reflection on what to do in certain situations. How to achieve (philosophical) depth in dealing with intricate moral questions, in this case in agriculture? In connection with the issue of the appropriate genre for ethics, the question arose of how to understand moral subjectivity and political deliberation when technology and society co-evolve in deeply intertwined ways.

We can conclude now that engaging in processes of material design, which involves the purposeful but tentative changing of relations and practices, makes for an interesting form to explore ethical concerns. Especially when combined with ongoing situated engagement and forms of public deliberation, design should be appreciated as an appropriate mode of not just communicating moral issues but also reflecting on them. Not the least because of the inclusive quality of this genre, in which groups that are often not considered to meaningfully engage in ethical debates (farmers, and even animals) can appear as active participants.

The upshot of the argument of this thesis is thus that carefully considered and publicly debated design projects constitute a form of ethical inquiry. These designs achieve this not just by being discussed in written philosophical interpretations and public debates, but (also) in themselves function as processes of reflection and communication. Thus, the thesis showcases a form of research that is accessible to a wide audience and lends itself to imaginative inquiry into possible future worlds that are brought into the present through envisioning alternative material practices and tinkering with these.

Co-evolution was revealed to be not just a process of mutual influence between basically material technologies and essentially discursive ethics. It also involves changes in bodily comportment, changing experiences of being a moral subject, changing sites and conditions of meeting others, changes in what it means to make an argument, to make sense of what is at stake in an issue, and to adequately describe and get a handle on a situation. Indeed, ethics in this way is already interspersed in practical material realities, not a separate, reflexive layer where systematic thought occurs independently of the ('directly') experienced realities that are reflected upon. Here, the distinction that some make between morality and ethics, between everyday unreflective moral behaviour and active ethical reflection, no longer maps onto the material vs the textual or linguistic.

The conclusion of the thesis thereby comes down to an invitation, a call to consider certain activities as relevant, if not central, in engaging with moral issues in a thoughtful and meaningful manner: to contemplate the various interconnected concerns regarding food production and the ambivalences involved in trying to get a grip on them (chapter 1); to go and visit a farm and be attentive to what farmers say and do, asking critical questions while being open to forms of justification that may not seem relevant at first. Also from an awareness that the visit will have a different character when it involves sharing in the farm work (chapter 2); to imagine the implications of radical technological designs, for the character of public debates and its participants, and also for (e.g. yourself as) a particular moral and political subject, with emotional responses and bodily changes mixed with commitments to rationality and justification (chapter 3); to consider the ways new technologies imply particular experiences and relations for farmers and their animals (chapter 4); to look at (and then relate to) the role of continually reinterpreted animal subjects as active participants in the shaping of a shared material culture (chapter 5); and, finally, to practically consider new (mediated) forms of relating to the animals we use, in a way that treats them as minded, idiosyncratic, learning and playful individuals (chapter 6 and 7); meanwhile aware of how particular genres of mediating and evoking situations promote particular forms of moral subjectivity in (and between) us (chapter 8).

Gradually, and increasingly towards the end, this thesis wanted to become something else. The type of argument that I just laid out is in danger of being undercut by adding more and more words. When this thesis would consist of a set of empirical chapters investigating ethics in practice, framed by a theoretical introduction and conclusion to reflect on those real world reports in more

theoretical language, this would attest to the idea that ethics and philosophy ultimately are and only can be a kind of writing. Even though written excursions into ethics and philosophy can be important, and were so for informing this thesis, it would detract from and ultimately undermine the argument proposed here to solely stick to this genre now.

The final conclusion, the outcome of the thesis, therefore is not a theoretical discussion of this position in relation to other positions in the literature. Nor does it offer a set of policy recommendations detailing how to regulate the livestock sector. Nor a supposedly compelling argument on what decisions we should make regarding the farming and eating of animals. Instead, I propose to consider the ongoing efforts of creating an interactive situation between farmed pigs and human consumers as the main 'conclusion' of this research project. This is a process that involves farmers, pigs and public responses; as such it is an example of the kind of work that can also be done under the banners of ethics and philosophy, without an ethicist or philosopher 'pulling all the (theoretical and argumentative) strings'.

The effects of writing: Socratic technology assessment

Pragmatically, what does all that writing on ethics and philosophy do? What type of engagement does it promote, what kinds of implicit effects does it have? When a book claims to be about 'farmers' ethics', with little chance of being actually read(able) by most (if any) farmers,¹⁰⁹ it thus says farmers have no full access to their own ethics.

Attempts to broaden the type of considerations beyond formal rational argument seem hapless when put in the mould of the text. There are too many books already that chapter after chapter dwell on the importance of lived experience, of engaged practices, of embodied encounters, of getting out there with your feet in the mud, the authors of which remain seemingly unaware of the self defeating nature of how a learned style of writing and the material form of a book actually invites and performs a very different mode of relating to moral issues. A form that is detached, cerebral and with a penchant towards abstraction and an implicit ideal of general

¹⁰⁹ Which of course is not to say farmers cannot read books. The point I am trying to make is about the genre of philosophical ethics, or social theory, that inexorably seems to come with a penchant for theoretical jargon. To which this thesis is no exception: even though for instance an earlier version of Chapter 4 was labelled by an anonymous reviewer as 'refreshingly jargon free', the other reviewers of the journal demanded a more thorough engagement with theoretical positions.

truths that one can learn by merely reading, ready to apply somewhere, wherever. The whole thing seems utterly ridiculous. One can write 'embodied experience' however many times, in the end too much writing and reading turns us into brains on sticks.

There is a long tradition of critique of the written word. Socrates, after a thorough assessment, decided against deploying the alphabet, the technique of writing texts. He considered this to be a harmful technology that would destroy people's ability to converse, memorize, and to have knowledge in the sense in which he understood it. He was worried about people losing the ability to be eloquent in a spontaneous way, geared towards a particular situation.

"[...] and now you, who are the father of letters, have been led by your affection to ascribe to them a power the opposite of that which they really possess. For this invention will produce forgetfulness in the minds of those who learn to use it, because they will not practice their memory. Their trust in writing, produced by external characters which are no part of themselves, will discourage the use of their own memory within them. You have invented an elixir not of memory, but of reminding; and you offer your pupils the appearance of wisdom, not true wisdom, for they will read many things without instruction and will therefore seem to know many things, when they are for the most part ignorant and hard to get along with, since they are not wise, but only appear wise" (Plato and Fowler 1990 [Phaedrus 275a-b]).

Socrates argued how the alphabetic extension of mind was far from neutral.¹¹⁰ The impacts of written words would eventually be further exacerbated with the invention of the printing press. Indeed, nowadays we tend to think of knowledge as facts gathered in textbooks, rather than something that wise people know and can explain convincingly to various audiences.¹¹¹

¹¹⁰ Socrates' critique could be thought to imply a rather internalist and individualist notion of mind and wisdom, which stands at odds with understandings of mind and thought in chapter 8; though somewhat less so if wisdom is conceived of as necessarily embodied and emergent in (Socratic?) dialogue with others.

¹¹¹ One could argue Socrates was self-interestedly defending his academic business model and educational method for teaching the liberal arts against much cheaper competitors offering speechwriting and distance learning. This however would not make his position necessarily less convincing.

The dream of direct access

Granted, not only is there irony in quoting Socrates on this, in a text, also it is a little farfetched to try and dismiss the subsequent twenty five centuries of philosophical writing as all a detrimental form of philosophy. There is the danger of idealizing instead an unwritten, 'direct' access to the world; a danger to which, according to Rorty, both Kant and Heidegger in their own way succumbed; by aiming for a final philosophy, an overarching mode of thought, seeking to exhibit 'the structure of all possible interpretation', or grasping the ultimate meaning of a line of poetry or a single Greek word (Rorty 1982, 93-4). Writing then seems merely 'an unfortunate necessity':

"What is really wanted is to show, to demonstrate, to exhibit, to make one's interlocutor stand at gaze before the world" (Rorty 1982, 94).

Dismissing the dream of unmediated access to eternal truth, Rorty instead sides with Derrida's project of contributing to endless reinterpretations; a project that has no further ambition than endlessly adding more and more writing. Opposing the ideal of purifying language to get down to the ultimate, true formulation, he aims to make philosophy "more unprofessional, funnier, more allusive, sexier, and above all, 'more written'." That final addition in Rorty's list is of course a pity. The visual metaphors 'demonstrating' and 'exhibiting' that Rorty protests against for seeking to provide some final 'overview' of the world can also function in less ambitious approaches, of endless experimenting with new views in new renditions in a way that is more analogous to the creative writing that Rorty advocates. Things can be made 'explicit' also by material tweaking and redesigning, which always also involves positioning within systems of signification, visual or otherwise.¹¹²

The dream of 'direct access' to a sensuous *lifeworld* (Abram 1997), an unmediated connection to the world around us, is indeed elusive too. Not all of the relevant reality is easily sensed. Global issues such as climate change, environmental concerns that only become gradually visible, require a large techno-scientific apparatus to be translated and mediated into something we can see or feel or grasp the meaning of. A Deweyan notion of experience is more helpful here, as this does

¹¹² When we take up the basic artistic criterion of 'show, don't tell' in this more performative way, rather than as ultimate truth claim that demands a revealing of what is really there, the saying does not come with the metaphysical baggage it has in Wittgenstein's Tractatus. There 'sagen' and 'zeigen', saying and showing or indicating, are opposed and mutually exclusive (Wittgenstein, Klossowski, and Russell 1983).

not involve a distinction between passive perception and active intervention. And, we could add, no rift between the material and the symbolic, see also Latour (2014). The meaning of an object springs both from the symbolic associations it may give rise to and the material affordances it provides, or the kind of behaviour it promotes.

Ethics beyond (just) writing

It would be an overly radical form of Luddism *avant la lettre* to argue we should disband writing altogether.¹¹³ And perhaps stretching philosophy to include less written or even non-discursive practices is unlikely to catch on. Philosophers tend to see themselves as authors and readers; spurred on by the demands of contemporary academia to produce ever more papers. Be this as it may for philosophy, for ethics more is at stake. Ethics is the genre in which we are to reflect, argue and decide what is the right thing to do and where to put our priorities. When that is widely deemed to be only and essentially a kind of writing –and a technical and often rather inaccessible kind of writing at that– this seriously undermines not only the access to work in ‘ethics’ for the large majority of the population, but it also contributes to a culture that dismisses situated, immersive and embodied experiences, much of everyday interactions with others, practical tinkering, creative design, and encounters with animals as in themselves irrelevant to how we ought to behave. All these sides to our moral lives are then considered relevant only if somehow taken up in the language of academic papers, or if amenable to the governmental perspective of policy reports and regulatory schemes.

It is not just “moral vocabularies” that are lagging behind rapid changes in our technological culture (De Vries 1999; Swierstra 2002). But the very idea of what ideas are and how they can be contemplated and communicated seems to have remained fixed (or at least bound within the medium of writing) ever since Plato.¹¹⁴

¹¹³ It may be strange to argue against reading and in favour of digital games at a time when reading books rapidly gives way to much more transient activity on smartphones and tablets. But besides only lamenting this development as necessarily only a loss of philosophical depth, other responses are possible. Instead, we can explore new ways to attain that depth. Within a co-evolutionary outlook, this search for alternative forms of being philosophical is likely to involve also shifts in what thinking looks like and a changing appreciation of how critical thought can be expressed.

¹¹⁴ This is also not to say that the seeming clarity and unambiguity of maps, photos, plotted measurements and calculated indicators offer a more direct access to relevant realities; For instance a medium such as cartography brings its own implicit ideologies of empire, travel, land ownership and modes of governing land, people and animals. But this to some extent can be engaged with by making alternative maps that disclose

When we now look back at his qualms with the alphabet, Socrates may have had much less problems with photo montage and game design, as these may function in more public ways as conversation pieces rather than produce the appearance of wisdom. But what Socrates may have thought of video games and *Photoshop* is probably a too anachronistic question to spend much time on.¹¹⁵ And for all we know, Socrates and his students were not particularly interested in material culture, sharply distinguishing between making and acting, with only the latter relevant for philosophy and politics (Achterhuis 1998, 216).

Alternatively, ethics is no longer ultimately a (rather inaccessible) form of writing, but everybody everywhere is potentially engaged in this reflective mode of morality, experimenting with alternative practices and relations. What we need then is to find material and practical equivalents of alternative 'vocabularies' and 'grammars'; new modes of experimenting, ordering and explicating alternative ways of living. Then the behaviour of some kid with an iPad and a farmer milking her cows both become something that warrants the kind of culturally deep interpretation and critique that a select few academics otherwise reserve for jargon filled texts in moral philosophy.

Surely, we want our ethics –and the moral subjects around us– to be accountable, to be open to a type of discussion that is based on rational argumentation instead of emotional whims. However, we tend to equate thoughtful reflection with the written form to such an extent that it is difficult to conceive of *ethical* reflection as anything else than writing. But remember the children of the pig farmer in chapter 2, who refused to enter the production facility in the backyard while it housed pigs in a standard intensive system, whereas they started going in after their farming parents changed it into straw based group housing. Without a need to say or explain anything, these children communicated their position to their parents. This is a first indication that intuitive, unexplicated, 'bodily' behaviour is not always merely routine, habitual and uncritical. Everyday morality is not only turned into ethics proper after being explicated and translated into the language of professional ethicists.

how maps and mapping techniques that we are used to in practice direct our gaze, discourse and thought in certain ways. Writing is not the only way to be critical and reflect. Philosophers and others at the writing side of the 'two cultures' should realize they are using a technology too, which allows for certain things to be communicated, and others not.

¹¹⁵ Even though games are now widely believed to 'spoil the young', a similar accusation to the one that became fatal to Socrates.

Too often it is assumed by us writing folks that ‘speech acts’, the performative functioning of linguistic utterances, are in fact the only acts that really matter. And that, on top of that, writing is far superior to speech; probably because we feel it allows (in the hands of able writers) for precise description and both grammatically and logically correct argumentation. Being stuck in the ‘linguistic turn’, in philosophy it seems implicitly assumed that the most meaningful ways of acting is to ‘do things with words’, instead of doing things with things too.¹¹⁶ A lot of (writing!) effort is now required to make us acknowledge the relevance of material matters in political practice (Barry 2001; Braun and Whatmore 2010; A. Mol, Moser, and Pols 2010).

Reading animals

Eco-phenomenologist David Abram has argued that writing functions to distance us from nature, setting human language apart from other animal sounds (Abram 2010, 176). Writing and reading as activities can in general be considered as individualist and distanced, as opposed to affective experience of collectively listening to orators, which was the classical Greek alternative.

Written texts have not been all bad. Indeed they allow for freely sharing ideas and the emergence of common convictions. But we can also acknowledge that at the same time texts in formal prose tend to afford endless scepticism and probing of ambiguities while leading to an (over)valuing of logical consistency (Stewart, Gapenne, and Paolo 2010, 26); Though of course writing also allows for skimming and skipping, for shelving and ignoring.

¹¹⁶ In fields such as science and technology studies and (more-than-) human geography the critique of language as the only form of communication and contemplation is gaining terrain. See for instance the work in STS on ‘material semiotics’ for an alternative approach that focuses on the symbolic functioning of material artefacts (Keane 2003; Bell 2003; Bettany 2007; John Law 2009) and other forms of material understandings of politics (Law and Mol 2008; Braun and Whatmore 2010) and ‘political machines’ (Barry 2001). But, with exceptions of course, there’s a danger for (also these) authors to remain just that, authors of ever more books and papers, the success of which now tends to be solely defined in terms of citations in other books and papers. How many (e)books on ‘new materialism’ do we need before we venture out and try another genre as a serious vehicle for inquiry, critique, and contemplation? Or, if we are writing to inform and enthuse practitioners of various kinds, including artists and technologists, what alternative genres of writing or analysis would best cater to them? In fairness, these renowned authors may inspire numerous others to indeed do so, but for a mere PhD student it seems less sensible to join in the chorus.

Haraway has drawn attention to practices of communication outside of 'writing technologies' (2008, 21), while also describing modes of relating that go beyond language, such as "the inventive potency of play" that "redoes beings in ways that should not be called language but that deserve their own names" (2008, 237). These alternative forms of communication do not reduce subjectivity, consciousness and cognition to language ability (2008, 371), and thinking is then not necessarily or ultimately linguistic in nature. Assuming language and writing as the privileged medium of thought and communication is therefore not an innocent choice. This is the case when engaging with a deeply practical and hands on type of activity, such as farming, but it is especially salient when thinking and communicating about human-animal relations.

Genres and styles

Setting up an absolute opposition between writing and real life, or texts and other media, or even spoken language and material practices, seems unhelpful. There might be ways to salvage books and talk in certain forms. Spoken language is, according to again the phenomenologist David Abram, in indigenous oral cultures experienced not as an "exclusive property of humans, but a property of the sensuous life world" (Abram 1997, 154). And one way of dealing with the overly human genre of writing is to claim others such as animals write too, for instance by leaving meaningful traces in the landscape (Hinchliffe et al. 2005, 647).

Various genres (novels, poetry, riddles, hip-hop songs) of written and spoken words exist beyond what is commonly considered philosophical prose. Genres that may afford us to 'show' rather than just 'tell'; think of the effects of epistolary novels on the moral imagination of 17th century readers, as discussed in the previous chapter. Moreover, in general word and life should not be thought of as a dichotomy, as both texts and language can be insurgent, creative and transformational (Philo 2012) and should thus not be seen in opposition to some kind of more real world that is lived with bodily presence. The practical use of language, or *language games*, can only be understood as part of *forms of life* which include material practices¹¹⁷ (Wittgenstein 2010). Thereby, the medium is not fully the message. Also the alphabet should not be seen in terms of a crude 'technological determinism', but as subject to co-

¹¹⁷ Thanks to Henk van den Belt for pointing me to this.

evolution and tinkering. The meanings of texts are not static. Ambiguity abounds, and there are many ways of 'reading between the lines'.¹¹⁸

The process of writing – as one way of reflecting on other type of interventions, was evidently also central in developing the ideas in this thesis and the visual and material practices it informed. So it is not a question of mutually exclusive modes of engaging with issues. Instead, we could try to rethink particular combinations of writing and other cultural forms. These can be understood as being part of a to-and-fro, from field to text to design and back again. And if we are going to write after all, for instance Montaigne already knew that certain styles of writing are conducive to particular forms of thinking. He invented the 'essay', a genre that is generative of a form of knowledge conceived as finding a personal style, considered to emerge in the process of writing, in which a world and the author spring up simultaneously.

An ethics in the making

How to take stands in materialized forms of ethics or politics? How to gain some philosophical depth and come to terms with practical complexities? When asked about my views on ethical concerns around farming, I have tended to not make generic statements based on theoretical ethical positions, or attempt to define centrally contested concepts, but to say 'Well I know a farmer that actually does....', or 'My experience on visiting a chicken farm involved....' What I find interesting about this type of response is not that this is more likely to silence an opponent or that it is supposed to refute other views. Instead, it is that debates can become more like conversations (cf. Rorty 2007, 124), in which people come up with their own experiences and interpretations, in a much more tentative manner.

In this process, we would do well to be more open to other, non-textual modes of ethical reflection and political engagement. For instance, acknowledge how the arts can be a form of ethical analysis and political theorizing too. As a famous example we could think of the Siena city hall murals by Lorenzetti, which played a significant role in renaissance political thought, as described by political philosopher Quentin Skinner (Skinner 1994; Latour and Weibel 2005). And just as Charlie Chaplin's silent film 'Modern Times' publicly displayed the downsides of innovation in factory

¹¹⁸ The particular type of writing that is idealized in academic ethics however tends to be aimed at reducing ambiguity, resulting in a genre that brings particular 'criteria of success', with particular understandings of clarity and what it means to be explicit and a certain form of logical consistency: something that people may underwrite.

production, also the documentary *Our Daily Bread*, which was described in chapter 1, evoked without a word being uttered the horrors and alienation as well as the fascinating and horrifyingly sublime aesthetic (Pick 2011, 140) of our contemporary food system. As we saw already in the opening chapter of this thesis, books (in various genres such as novels, poems, or journalism) and films –besides technologies, as we found in later chapters– can promote in us particular modes of experiencing reality, and help emerge particular moral subjectivities: persons that are empathizing, shocked, angry, disillusioned, or fascinated and even enchanted (cf. Bennett 2001; 2010).

These art forms and arguments may ‘work’ without being explicitly discussed. Even though discussion and interpretation of artworks may influence and deepen our experience and understanding of them, few people would argue that their meaning could be wholly and best transferred to a textual form, as pure ‘information’ or written ‘argument’. Some writing on art helps to sharpen our experience of artworks, the meaning of which we may sense but ideally would also debate. Only there is always the danger that the writing creates a barrier to engagement, making us look at the description rather than the artwork itself, detracting from the power of experience.

There are many examples of how writing can be a helpful genre to reflect critically on our experiences; we need Cronon’s ‘The trouble with wilderness’ (Cronon 1996) to reveal the sometimes insidious effects of wilderness concepts implicitly promoted in for instance the landscape photos of Ansel Adams. In order to learn how our wilderness ideal tends to leave no place for humans other than tourists, which may lead to policies that displace indigenous communities from their land in the name of wildlife conservation. The seemingly unmediated, overwhelming aesthetic experience of being in the wild, without a trace of (other) humans, should then be critically examined for its cultural genealogy and pragmatic effects, rather than taken as primordial truths that we come into contact with. Thus romantic pragmatism, the strand of pragmatism that aims to evoke and disclose alternative worlds, should involve its own critical examination and deconstruction. Indeed, there are books that critique the common genre of wildlife films for the kind of representation of nature these produce (e.g. Bouse 2011). Alternatively, the issue of representing and conserving nature can be delved into – not just communicated to wider audiences but actively thought through – by producing alternative representations of ecologies and wildlife; Something that can be, and is, done by

new technological and artistic practices, different types of nature film, or otherwise creative modes of generating experiences of nature.

Of course, reading is an experience too. The genre crossing authors such as Singer and Foer discussed in chapter 1 seem to have achieved real affective and reflective change with many readers. The main point here is that we could do more to engage with practical expressions of value of for instance farmers; and we should see forms of non-textual communication as not just haphazard attempts at communicating ethical decisions that are actually made in writing, but as themselves potential genres of contemplation and argumentation. This also is a caveat to an understanding of especially chapter 2 of this thesis: how sensible is it to try and provide a theoretically supported articulation of what farmers would actually have wanted to say, or write?

Towards a multisensory ethics

Cora Diamond (1988) was primarily worried about people 'losing their concepts', the terms in which they could understand and explain their everyday –and not so everyday– lives and the decisions they were making; for instance in relation to animals, as mentioned in chapter 2. But not only the concepts by which we would be able to express our experiences are endangered. Also the experience itself of, for instance, being among huge, slow moving, inquisitive, or dull dairy cows is becoming rare. When a group of artists recently embarked on a project to create a 'toastie' (ham and cheese sandwich) (Tosti Fabriek 2013), one of the things these young urbanites to their surprise discovered was that 'cows are huge' and dealing with them can hurt.¹¹⁹

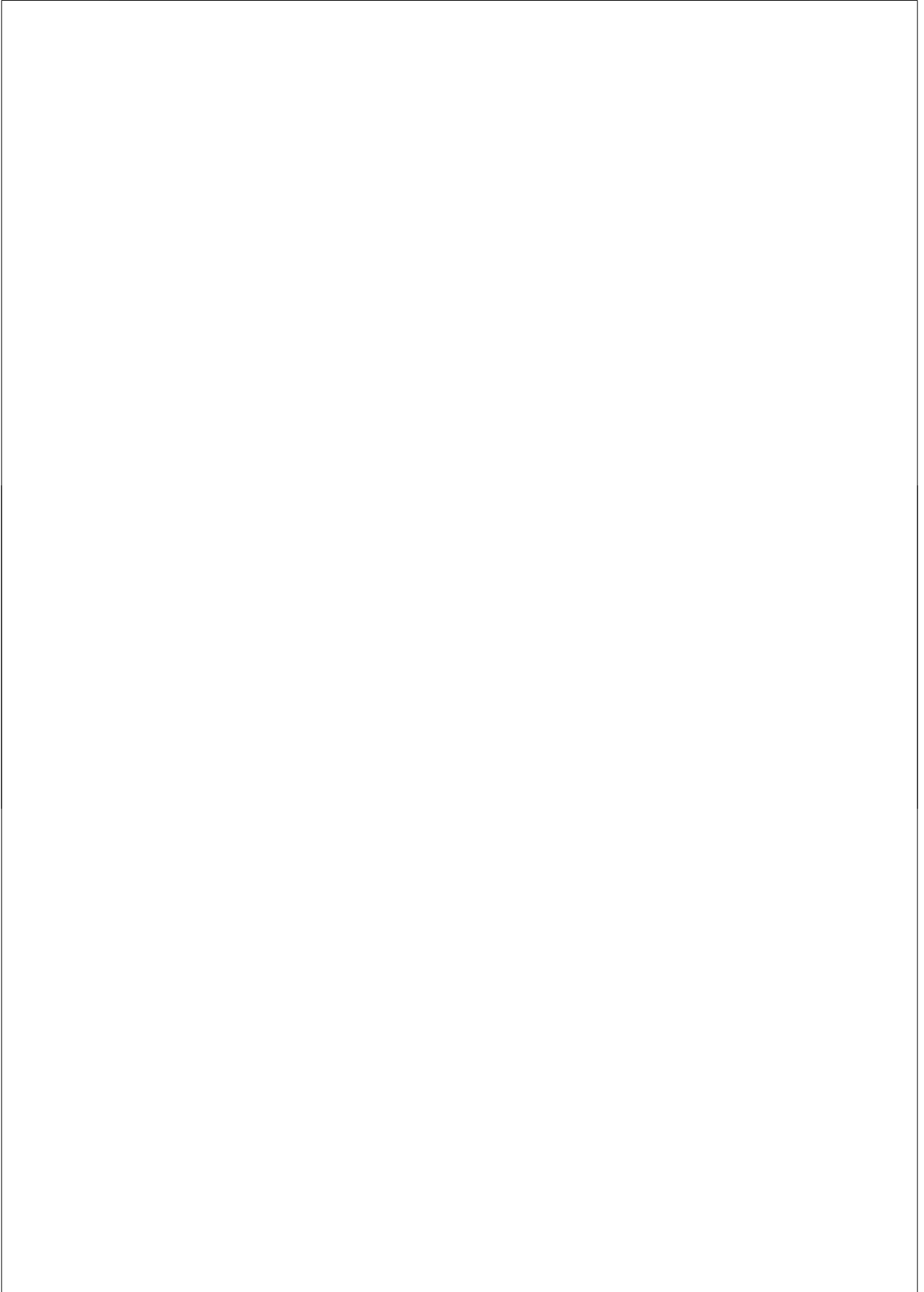
Often this type of direct engagement with moral issues is highly accessible, and does not require complex philosophical analysis or scientific research. It is fairly straightforward to commit to the relevance of the horrific smell of intensive pig farms. Not just for imagining the ordeal of these animals who only breathe fresh air on their way to the slaughterhouse. Nor only for the farm workers that spend time in this unhealthy surroundings. Nor for the neighbours, or the environmental pollution this indicates. (And I am not even thinking of how the quality of the meat may be affected by having grown for six months in an unbearable stench.) This type of sensory experiences could be accorded a serious status of more directly

¹¹⁹ Leading these novice dairy farmers to post *selfies* of their cow inflicted bruises on social media.

informing how we should feel about this mode of farming. In my own reflection on the acceptability of pig farming practices, the recollection of ammonia is quite central, if only for occasional odours emitted by shoes or cameras weeks after a visit. At the same time, a whiff of the sour smell of cow feed instantly brings back fond memories of my 'becoming' a dairy farmer. It might be as reasonable as any other variable to decide on how to design farms based on how they smell. Discussions then revolve around whether particular smells are obtrusive industrial emissions or belong to the countryside.

The genre of dense theoretical language promoting the ideals of sensuous embodied experience and situated knowledge has an unintended ridiculous side to it. Arguing for affective local practices in ethics and philosophy may easily just remain writing, and actually have an opposite effect. Even though I have met some amazingly versatile farmers, those people with the time and the ability to read specialized philosophical prose are unlikely to go out in the morning to milk a herd of cows. (Perhaps a robot would help them free up time for this though?) The idea behind this thesis is hoping to inspire others to go out in the world and do things, to have experiences instead of only reading about them. And even though reading amounts to an experience too, it has become a rather dominant one in reflecting on what aspects of reality to take serious as relevant to decide on things. I do not want to say that philosophical problems cannot be real or relevant, just that what we specialized academics commonly consider to be philosophy should not be the exclusive way of trying to study and tackle them.

Of course we can note that academic philosophical and ethical literature – next to work in (more-than-) human geography, anthropology, rural sociology, animal studies, science and technology studies, and related fields and disciplines – was important in the development of the argument of this thesis. But so were films, artworks and creative designs. So, at the end of this meandering chapter, what I argue for is a type of writing and doing ethics that is best practiced in close relation to other genres of critical inquiry, such as artistic practices, seeking out embodied experiences, creating visionary technological design and material tinkering with everyday activities. In order for this thesis not to be fully self-defeating, the final chapter will explain the ways in which the game design project was the outcome of and continues to be informed by the rest of the work in this thesis. Thereby the conclusion may provide, on the basis of this example, a tentative 'field guide' or 'handbook' for doing ethics through design and material tinkering in public.



A conclusion in the making

10.1 On the very idea of a general conclusion in situated ethics

Now it's time to take stock and return to the questions posed in the introduction: where can we situate ethics and where are we to look for ethical subjects? How can we appreciate ethics on the farm and the ways in which farmers deal with the mosaic of ethical issues they are confronted with? What genres of moral debate and philosophical inquiry are appropriate and helpful (or irritating and disruptive) for engaging with these ethical concerns? How are we to consider the variety of forms in which moral subjects may emerge in our contemporary high-tech food system? And how can we actively relate to processes of co-evolution in which material cultures and socio-technical arrangements unsettle moral norms?

These questions were found to be thoroughly interconnected, even more so than imagined at the outset. And it appeared promising to engage with them by looking at processes of design. This does not mean situating all ethics in the hands of an idealized 'designer': a kind of creative genius and socio-technical expert who as some god-like 'über-agent' envisions a future world, including its moralized inhabitants that come with particular experiences and self-understandings which are all fully scripted by this moral mastermind. Instead, design here is a much more tentative process in which agency is distributed among various forms of expertise and informed by moral concerns, both of which (knowledge and morality) can be found to emerge within that ongoing process.

In the preceding chapters we have come across a wide variety of designers and designs: designs by stem cell scientists or system innovators planning for a world without farms; design, or *bricolage*, on farms, by farmers together with animals and

technologists; and design on the farm by artistic designers and a philosopher, taking, besides farmers and animals, (consuming) subjects into account as users and co-designers. This appreciation of the multifaceted and deliberative character of processes of *bricolage* and design made writing a thesis more and more an activity that seemed to miss the point, to detract from its own conclusion, as I discussed in the previous chapter. More than a discussion of literature, this thesis aims to be an intervention that goes beyond the writing of a (philosophy) book. As part of this, the Playing with Pigs proposal has already managed to reach a broad audience.¹²⁰ It is important to note that this popularization is not to be seen as a dumbing down for the public of my independently conceived philosophical thoughts. Instead, this public engagement was itself part of the research and the form in which the ideas were not just communicated but crafted, interactively, together with designers, biologists, farmers and pigs.

Also, when seen in this light, the thesis can be read as a series of (theoretical and practical) steps proposing to ever more wildly reinterpret and expand the notion of public deliberation: to include the ideas, embodied practices and experiences of farmers (chapter 2); to include radically new technological designs as occasions for opening up debates on farming (chapter 3); to include the moment of actually developing and implementing a new technology on farms as promoting reflection and debate amongst farmers (chapter 4); to then also include animals as active participants in these processes of system innovation and tinkering with material arrangements (chapter 5); and to then design new technologies in such a way as to instigate these processes (chapter 6 and 7), thereby involving different designers (not just agricultural technologists) and a wider range of audiences that are ordinarily not interested in reflecting on, let alone debating, animal production. Ultimately, we found that even the individuality of these deliberating subjects became fluid in the processes of material deliberation (chapter 8).

¹²⁰ Published in December 2011, two and a half years later (July 2014) the video (<http://vimeo.com/29046176>) had been viewed over 120,000 times, while the project website (www.playingwithpigs.nl) had received over 60,000 hits. A wide array of public media have reported on the project or interviewed us: Chinese, South American, and Russian game blogs, French, Dutch, and German radio stations, Danish breakfast TV, a Belgian popular science TV show and late night talk show, magazines on digital culture such as *Wired*, environmentalist weblogs such as *Treehugger*, and several North American and Dutch newspapers (*NRC*, *Volkskrant*, *AD*).

Instead of what seems an inherently self-defeating attempt to end this thesis by drawing general conclusions on a more abstract theoretical level that aim to transcend the nitty-gritty of getting cows to milk themselves and pigs to play with us, the remainder of this concluding chapter explains how the situated and material endeavour of the pig game design project itself can be considered as a proper conclusion to this research project. In this way I will draw together the instances of co-evolution that were encountered in various places and putting to use the various lessons of material animal deliberations and ethics on the farm.

10.2 Ongoing efforts towards playing with pigs as a conclusion

The Playing with Pigs project described in chapters 6, 7, and 8 builds upon the ideas in each of the previous chapters. This is not to say that the project is the application and culmination of all the knowledge gathered earlier¹²¹ but rather that it allowed for a more hands-on form of exploring the ideas developed in these earlier chapters. Thus, to illustrate the claim that design can be a way to relate to the co-evolution of socio-material practices and ethical reflection in a materially situated learning process, let's now see how the interpretations grafted upon the other cases in the thesis may translate to this one. After this overview, in section 10.3, I will discuss not just the potential of this approach to complement and reinvigorate ethics, but also possible pitfalls for doing philosophy and ethics in a material design mode.

1 – Opening up ethics as a genre

What is the role of philosophical ethics and of 'ethicists' as practitioners of this genre with regard to issues in animal farming? How does ethical inquiry relate to other ways of discussing and engaging with these issues? With a game that is played with pigs, the ethicist does not decide or even analyse centrally, as a moral expert, what should be considered acceptable farming practices. Instead, he or she creates a platform, a vivid conversation piece, that allows the public to imagine, experience, and otherwise grapple with these questions.

¹²¹ A claim of linear learning and knowledge application that can easily be dismissed because of the fact that most of those previous chapters (all apart from chapter 2) were (re)written after the game project had started.

The game – or rather an endless variety of possible pig–human game set-ups – could function as a new critical ‘genre’, promoting a renewed look at existing practices and arguments. Thereby, debates, in this case especially on animal ethics, can be widened to include people other than scientists and representatives of animal organizations. Ethical competency (or perplexity) can be revealed to be widely distributed. With the game, an understanding of what it means to ‘do ethics’ can also be elaborated that emphasizes the imagination and playfulness, and new modes of engagement. Although it refrains from taking up an overtly activist and alarmist role, this approach does not aim at convincing people of particular moral truths. Nor, however, does it claim the strict neutrality of just providing a straightforward representation or mere analysis. It is clear that specific designs for human–pig interaction will highlight certain aspects and generate particular situations. Ethics here is thought of as a matter of provoking an intensified experience of ambivalence, promoting contemplation in new ways, and discussing ingrained practices.

Is pig farming an *acceptable* animal practice at all? This is a very complex question when taken as a philosophical one. An endless array of sub-questions emerges: on the moral status of animals as compared to humans, on whether the suffering of a farmed pig can be thought to offset its pleasure in life, on whether death is a harm to the pig if it could be painless and instantaneous, or whether the bringing into existence of another pig makes up for slaughtering one (see Visak 2011). Playing a video game with a pig would involve a different experience of these types of questions in a new and to some extent more direct (albeit mediated) way. Inadvertently, after being seduced into this problematic situation, the human gamer may at some point start to assess whether life in the pen is worth being killed in the end. Does the pig one interacts with come across as motivated to live, perhaps even enjoying his or her life? Is the life of the pig in an intensive farm a fair bargain? (Or is this an inappropriate question?) Do we, by playing with them, refrain from using the pigs as mere means? And could these few-months-old mammals be considered to have beliefs, desires, motives, and memory, and thus experience being a ‘subject of a life’ (Regan 2004)? What are our duties towards non-humans that can be thought of as agents (Kaldewaij 2013); a type of agency they may reveal in our mediated encounters?

In thinking through these traditional animal ethics questions while playing together, emotional experiences, affective relations, and the particular ways in which the pigs appear will also play a role in this combined moral/scientific assessment. To some extent, the questions posed here are revealed as overly abstract, formal, and

distancing from the places where they could be answered in nuanced, fine-grained, and ambivalent ways.¹²² The experience of interspecies play may generate contemplation on forms of ascribing a moral status that is not thought to supervene on certain qualities that make pigs in some way objectively close to humans, especially as prolonged interaction could give rise to a previously unimagined appreciation of a very different life form.

The genre of a game also stands out in comparison to the two (Austrian) documentaries mentioned in the introduction of this thesis, which in the German-speaking countries are designated as *depri-kino*. Who – what kind of moral subject – is supposed to come to the cinema to undergo this depressing genre? Consumers who feel the need to repent for their environmental sins and cultivate a sense of guilt? Concerned citizens informing themselves about the current state of food production, while perhaps in part also lured by the promise of sublime imagery? The resulting moral subjects are managing an uncanny mixture of crafting their moral imagination while revelling in horror. Besides the question of why most people quite successfully make an effort not to think about slaughterhouses during most of their everyday lives, the question of why some people actually do go visit one is interesting. From my own experience, I cannot deny that this may be an odd mixture of having a sense of duty to engage with the reality of our food system, together with curiosity, fascination, and actively cultivated repulsion.

Will the real moral subject please stand up?

As in the documentaries, moral subjects can be imagined, staged, and enacted in different ways (cf. Law and Mol 2008). Like the farmers discussed in chapter 2, we are all muddled figures filled with mixed emotions; at each moment of the day linked to a variety of societal domains, material practices, and symbolic orders. But most of us are able to zone ourselves into separate commitments and moral roles, in line with the different societal ‘orders of worth’ of Boltanski and Thevenot that I have projected on the farm. What is commonly lamented by anyone hoping to improve farming practices is the perceived practical difference between citizens and consumers, which appears as the difference between stated and revealed preferences: between what many people say they want in ‘the political sphere’ and

¹²² Which, however, does not necessarily mean that the situation and the attending practice cannot be questioned in their entirety from a more situated position, cf. Diamond (1978).

what most people actually buy in supermarkets (Brom et al. 2006; Meijboom, Visak, and Brom 2006).

The challenge of creating a properly moral subject, then, seems to be to somehow turn mindless consumers into responsible citizens. This brings home the fact that buying and eating meat and dairy (or anything, for that matter) is never a purely rational thing. People in the designated aisle in supermarkets tend not to weigh up all of the societal costs and benefits of particular protein sources. Embodied, emotional, communal, symbolic, and relational types of considerations are there too. Besides our rationally calculative and morally altruistic brain (which probably figures somewhat in the background, ceding priority to the adherence to daily routines), taste, smell, and identity formation also weigh in. This is what makes us consumers such a volatile lot. But we should be aware that this way of conceiving the challenge of moralizing consumers involves the assumption that we 'as citizens' are well-informed, logically consistent, and fully committed to ideals of justice and non-violence.

So, the point would be not to attempt to turn these two separate figures into one coherent moral agent, a civic consumer which would bring material practices in accordance with the words expressed in ethical debate. For instance, by making us into completely rational moral agents committed to universalist principles; or perhaps calling upon our conscience in more emotional ways. The game is meant to do something else. It adds another, a third, figure, someone to whom playing with pigs sounds like fun, but who, upon further contemplation, finds him- or herself in a brand new rational/emotional moral conundrum. In this way a moral subject emerges that is a more explicitly complex mixture of self-interested and altruistic dispositions, in a situation linking habit and contemplation, and affective and rational experience.

Playing with pigs, then, offers a very different kind of invitation to, or seduction of, what a moral subject is to choose to undergo than what is offered by documentaries such as *Our Daily Bread* or *We Feed the World*. Not via dutiful revelling in prophecies of doom and environmental destruction, but through a different kind of rhetoric. One that literally, or rather 'materially',¹²³ plays on feelings and embodied experiences without fully prescribing how one is to feel and what the experience

¹²³ Or perhaps virtually (for a minute assuming this distinction still makes sense).

will amount to. This is made to remain open; one reason for this is because we, the makers of the game, are not really sure of how to feel about farming pigs, let alone about playing with them.

The game (for now merely as a visualized thought experiment) constitutes a breach in what are normally considered two strictly separate practices: playing with your pet, and raising animals for food (cf. Korthals 2002; Herzog 2011). How one considers this intervention depends on our understanding of practices and how we are to appreciate their normative status. In a pragmatist ethics, we do not need to assume existing practices to be 'given' and normatively static. The design can, then, be thought of as an intervention in seeing to what extent various people will manage to align their involvement in these practices with their new experiences. When, however, practices are considered more statically, or as themselves sources of the moral good, people are right to protest against this undue mixing of what should be separate activities, each with their own intrinsic aims and meanings – as in a conception of practice such as that of MacIntyre (2013; Keulartz et al. 2002, 252).

Of course, a (badly designed) game could very well deflect the serious questioning of current practices, creating a *gamified*, feel-good facade to what one may find a horrific industry, functioning as a new tool in common strategies of 'not wanting to know'.¹²⁴ On the other hand, farmers have argued that there is a danger that urban folk would become further alienated from rural realities when farm animals become 'man's best friend' too. But the advantage of this approach is that this type of deciding on the legitimacy of a practice –and perhaps even its abolition– is not something a philosopher needs to do, or that is conceived of as a theoretical challenge of finding the right arguments. Instead, an entire genre of intervention is opened up, which allows us to engage with central concerns that otherwise tend to be ignored. Perhaps a good indication of the subversive and ambiguous character of the project is the sheer variety of responses received after presenting it to different audiences. I have been critically questioned for (not to say accused of) turning a serious issue of industrial-scale animal suffering into a joke, while on another occasion some people drew the conclusion that they needed to become vegetarians.

¹²⁴ Cf. Van der Weele (2013) for a discussion (in Dutch) of the complexities of the moral self and its relation to undesired knowledge.

2 – A high-tech mediated farm visit

Playing with pigs could be a way to bring a 'virtual' farm visit to an otherwise rather inaccessible animal production sector. This would be a farm visit that is not rooted in nostalgia, but that engages with the peculiar mixture of artificiality and naturalness, of high tech and tradition, and the variety of relations which (still) make up farm life. In this respect, the game might draw attention to the practical complexities and local solutions of individual farmers in dealing with the full range of ethical concerns and piecing these together into a coherent mosaic. Thereby, it builds on the ambivalence of the farmer experience described in chapter 2, and on their 'mixed motives' and the 'ethical chaos' they find themselves in (when considered from the outside).

We can say that the core issue in a pragmatist approach to ethics comes down to the question of whose experiences are relevant or should be accorded the status of moral inquiry? And from this, other questions follow, such as what counts as an argument and, in our situation of agricultural ethics, which farmers' experiences are we going to highlight? The farmer who each evening goes to his tie stall to spend some time with his cows? Or the farmer who revels in the productivity of the smooth flow of machinery and a well-performing dairy herd? Both?

Depending also on the extent to which the game would offer a further glimpse of life on the farm, we may be able to generate a wider understanding of the types of moral experience farmers have, something that is currently either absent from public debate or is idealized uncritically. We could develop new and more complicated notions of care and the ambiguities of the relation with animals that is specific to the practice of farming. While at the same time we could also question whether this type of playful human-animal interaction, which on a regular pig farm does not exist, would be required for meaningful animal production in our postindustrial culture. The design project aims to offer an experiential mode of ethical inquiry that involves a previously disinterested public in a mixture of very different types of justifications, motives, and emotions.

The activity of designing a game for farmed pigs, at a farm, has meant spending time at farms not only with pigs but also with farmers. It proved a good excuse (albeit at first one that raises some eyebrows) for spending a few days in the pen. We had a 'job' to do there, one that we needed to closely negotiate and coordinate with the farmers. The farmers needed to see some kind of benefit for having us there, either

by getting paid directly for the trouble, or by seeing the advantage of publicity and being at the forefront of attempts at improving welfare, also in the public eye, or even considering our game as a potential solution for their problem of pig aggression. Since we published our project, several pig farmers have got in touch, asking whether we could come and test the game at their farm, emphasizing how their children would love that. With the option of a game, apparently the view of the children on the family's farming practice was changed, the importance of which I discussed in chapter 2. Farm animal video game design thus functioned as a way to make the next generation (that in the eyes of many parents seems lost to digital media) interested again in what happens at the production site in their backyard, perhaps even take over the farm one day.

But ours was a job that was rather different from the core practice of farming. This created a critical tension that made for interesting conversations. We were dealing with the same animals, but to us they appeared in a very different light: one full of playfulness and intelligence rather than productivity. Our outlook revolved around openness to surprise rather than optimization and efficiency. Instead of trying to control behaviour and standardize conditions, we were trying to interpret the meaning of behaviour and learn ways of promoting unexpected moves. We were looking for individual differences in the animals rather than trying to meet their demands generically. Both the design process and the eventual playing of the game imply a very different form of experiencing pigs: being with particular pigs much longer than the industrial farm worker with his or her strict time budget. After a day in the pen setting up our prototype, the curious pigs had been sniffing and chewing for hours on these 'creative class' temporary farm workers, making us the humans they had most interacted with in their lives.

Playing with pigs is thus most subversive by muddling two domestic practices that are normally kept strictly separate: animal production and animal play. Will the newly entangled farm practice help against 'losing our concepts', as Cora Diamond (1988) called for, in view of John Berger's evocation of traditional peasant life in which relations between humans, animals, and food could be expressed self-evidently? In industrial pig farming, one could argue that there are very few 'concepts' left to articulate experiences of meaningful relations. Indeed, considering how farmer-pig relations in intensive mega-barns are to be fully optimized and thus minimized, Berger's peasant version of pig farming seems utterly inappropriate, romanticized nostalgia. The only relevant societal order that has come to dominate all meaning in these sites is industrial, with the attending norms of efficiency and

cost reduction. Pigs in practice are defined in terms of feed conversion ratios and the leanness of their genotype. Only state-enforced animal welfare measures are meaningful here to potentially improve the situation, in which farmers then figure merely as reluctant barriers to improving conditions.

Instead of institutionalizing animal ethics in committees and formalizing moral debate, playing with pigs in this situation may make for renewed conversations about the meaning of pig farming and help gain new concepts, or contrasts, for farmers to reflect on their practice. This is relevant considering that when in intensive production farmer–animal relations are no longer meaningful, and pig behaviour is no longer meaningful either, then the basic implicit justification for killing them for food as part of a shared life form is lost. No welfare improvement may be enough to make up for this original intimacy and ambivalence associated with preindustrial farming (cf. Mizelle 2011). In intensive animal production, not just concepts to describe experiences are lost. Responding to John Berger’s observations about daily peasant–animal interaction, Hayden Lorimer asks:

“how best to encounter the textures and cycles of work that leave a landscape replete with meaning. What creative strategies might be employed to reanimate, however temporarily, this embodied relationship between individual subjects and an environment?” (H. Lorimer 2006, 504)

Can a video game constitute a way to generate new meaning and somehow create a mediated embodied relationship with the kind of situated daily rhythms and routines associated with farming? Or would this particular form of mediated playful interaction detract from a farm visit that still involves a more fully embodied and more directly affective encounter – even if this only involves sharing the gagging smell which the industrially farmed pig endures without knowing anything else? Moving a finger over the screen of a tablet computer to connect to an animal is not the same as trying to handle a cow or a group of piglets. These latter experiences will almost certainly increase respect for the cow and its massive physical presence that outweighs us and for the farmer, for being able to handle these animals.

To realize this more immersive experience can to some extent be part of the design challenge of an interesting game. Will playing it turn ‘carcasses’ into ‘pets’, the only two remaining categories of animal life in modernity, according to Berger (2001)? Or could it be possible to design what would be true encounters with animals, regaining or newly finding different concepts for thinking about our relations to

pigs? Will this promote the appreciation of farmers, or only contribute to a sense of alienation regarding their practices, which are, in intensive industrial farming, far removed from anything we may experience as meaningful human–animal relations? Or, if it does foster a deeper understanding of farmers, will it be deliberative and critical enough for the farmers to reconsider their practice? Ultimately, an interactive human–pig game platform may inspire systemic innovations, obviously not as a set of purely technical challenges, but with moral considerations at every turn.

3 – Disclosing moral worlds by game design

One mode in which technological designs co-evolve with ethics is through what in chapter 3 was called ‘world disclosure’. Spectacular designs may stir the public imagination and (on second thoughts) can unsettle common ways of looking at existing everyday practices. This dynamic process was shown, in the cases of in vitro meat and high-rise pig farms, to work in at least three ways. First of all, making a design project public, even before it is actually realized, functions as an occasion for debate. That would be a debate not just on whether to accept the proposed technology or not, but also on the wider issue the design is meant to intervene in, in this case current-day intensive pig farming. The resulting setting for this debate can be radically different, with new actors and surprising coalitions entering the scene. Secondly, during this debate, the terms in which to understand the issue may change, or shift in meaning. And, thirdly, the characteristics of what are considered the central moral actors can be rethought under the influence of the new design project, including a shifted appreciation of embodiment, emotions, and experience, and the relevance of particular moral commitments. Thereby, even what it means to be a moral subject can be seen to change in the light of responding to a new technology. Below, these implications will be discussed more elaborately.

Spectacular technologies and their design are not the only forms in which moral worlds are disclosed. As discussed in chapter 3, technological world disclosure often happens in consonance with language (e.g. new evocative words) and (for instance visual) artworks. But the activism of social movements, as well as lived alternative moral practices, may also have this effect. Think of taking part in a ‘vegan challenge’ and the ways in which attempting to consume according to a vegan standard for a week is said to profoundly change people’s awareness of the presence of animal products in our society, something that by visual means was achieved by the book

cataloguing the stuff around us that contains substances derived from pigs' bodies, by Christien Meindertma (2007). Besides the arts and various genres of photography and film, disasters and crises can also disclose moral worlds; think of the collective experience of watching media reports on European efforts at 'stamping out' several farm animal diseases in the 1990s. But public experiments can also be world disclosing. Consider, for instance, how the Oostvaardersplassen 'rewilding' area has enthralled participants in Dutch debates on nature conservation (Lorimer and Driessen 2014) and forms a powerful antithesis to common ideals of farm animal welfare (Lorimer and Driessen 2013). Sometimes these experiments are initiated by non-humans, such as in popular media stories of an occasional cow who breaks loose just as she is about to be slaughtered and, in a rare instance, even manages to successfully flee and live independently (Pachirat 2011; Twine 2013). Thus, animals themselves, by behaving in certain ways and responding to encounters with us, can also be a source of world-disclosing experiences. Donaldson and Kymlicka argue that animals, with their mere presence in public spaces, can be advocates and agents of change (Donaldson and Kymlicka 2011, 114). But more personal encounters with animals can evidently be highly formative and life changing, leading to transitions in ways of thinking and experiencing the world. Just think of Montaigne and his cat.

Also, moral philosophy texts can make us look again at our cherished beliefs and everyday practices. It may not always come down to just post-hoc rationalization, as quoted from Coetzee in chapter 1. This could be the case, for instance, when these texts manage to lend appeal to a particular ideal, autonomous, and reflective subject that is committed to rationally justified moral behaviour. As is inherently the case in any form of world disclosure, this type of thinking, however, also closes off and renders invisible other possible worlds and ways of being ethical in them. For instance, feminist critiques of concepts of rights and justice have drawn attention to how the ideal of moral and political impartiality may serve ideological functions: by masking how particular dominant groups claim universality for their perspectives; and by legitimating hierarchical decision-making structures, while relegating difference, particularity, and the body to the private realm (Young 2011, 96).

A world-disclosive dynamic can be seen at work in the pig game design project, even before the game is actually realized, as in the case of both the pig tower and in vitro meat. And in line with these examples, having an opinion about the game – which many people apparently do – is often found to mean having a (reconsidered or explicated) opinion about pigs, about pig farming as a practice, and about current conditions for pigs. In fact, the European directive itself already works to disclose

the world of the pig farm anew. Many members of the general public who hear about this directive for the first time (in relation to our design project) express amazement about toys for pigs being a regulatory requirement, especially in the US, where these enrichment regulations do not exist. But also before our project, the regulation opened up new ways of looking for the farmers, who were left free to develop solutions themselves and started to experiment with, for instance, chains, ropes, and plastic poles. In the light of meeting this regulation, and with pig boredom formally recognized, farmers started to observe their pigs differently, as potentially playful animals that need to be entertained, leading farmers to discuss amongst themselves and with outsiders what to do to meet the pigs' desire for 'distractions'.

Occasions for debates with others than the usual suspects

Designing a game brought together people from several backgrounds and disciplines. In the process, they were led to make their moral positions explicit and to explain or renegotiate their interests and views. After publicizing the concept video, the development of the game appeared of interest to an unexpected variety of organizations and public media. In this sense, the game design process already started to function as a deliberative arena, in which a variety of otherwise unconnected literatures and fields, such as game design and animal welfare research, can inform each other. Moreover, those entering the debate were not just the usual suspects. Or if they were, the common roles regarding the issues of pig farming were somewhat subverted: farmers as well as some vegan abolitionists appeared uncertain what to think of this plan.

Thus, it seemed possible to actively design a 'boundary object' (Star and Griesemer 1989; Mol 2002, 138) that functions to bridge or connect different social worlds by being meaningful in each of them. Or, in fact, to disclose a new world, with elements of the home and the farm, and of intensive production and artistic design, uneasily juxtaposed. The design challenge is to, then, maintain this multiplicity of meanings, and to tinker with these symbolic characteristics in order to promote deepening of reflection and deliberation.

New kinds of arguments and changing issue understandings

In creating this boundary object, an issue is newly delineated, forms of knowledge are rendered relevant, and particular publics brought into relation with each other. Some responded to the design proposal by assessing in various ways its pros and

cons. In terms of traditional forms of applied ethics, questions may emerge about whether to consider the autonomy of the pigs is improved by having certain types of games as enrichment, for instance by increasing their control over their environment. Or perhaps, in the trajectory of searching for playful activities to function as enrichment, the meaning of 'autonomy', together with that of animal subjectivity, might be found to change in character.

It is clear from public debates that emerged in various media that discussing this game is not a matter of assessing the new technology from the perspective of a morally neutral or perfect world. The design proposal thereby offered a space in which to publicly discuss the issue of pig welfare where new types of arguments became more central. The (idea of a) pig game could function as a different benchmark in thinking of pig housing conditions. The radical proposal implied a moral argument. Not only did the design contribute to a focus on boredom as a welfare issue, but the elaborate game interface (which in the publicized concept video seemed like a gigantic touch screen) made existing enrichment materials appear as very poor.

At the same time, the understanding of 'naturalness' as an ideal for pig welfare could be questioned or interpreted in new ways in the light of a potentially successful game, in which the animals display new behavioural patterns and possibly even find new modes of expressing their animal subjectivity. Discussing the features and functionality of the game might very well give rise to the idea that pig psychology should be considered to be 'developmental psychology'; we're dealing not with aggressive animals, but with aggressive young animals. Perhaps they are best understood as analogous to 'children' that need an upbringing?

And finally, the game helped redefine the issue of farming pigs as also raising questions about the meaning of evolving human–animal relations, and not just being about the duties to relieve suffering. The ideals or norms of symmetry and the intrinsic motivation to play that emerged from trying to make mutually interesting games may at some point 'trickle down' to become standards of farm systems design. In a truly symmetrical co-evolution process, these insights would not be only a matter of changing moral views on the treatment of pigs, or generating knowledge of their behaviour, but would also offer a renewed look at our ideas on human subjectivity, human–animal practices, and experiences of play.

New moral subjects

The design involves making a moral subject emerge that did not exist before: a ready-to-play, digitally connected, self-consciously 'bored' subject which was not necessarily prepared to ponder food-related moral considerations, but is about to connect in a new way to some other being, normally only encountered on a plate. Judging from the enthusiastic responses to the concept video, a number of the human players eager to enter this farm/game world could very well be 'unexpected' game enthusiasts. It will be interesting to find out how playing with real pigs might draw introspective attention to the phenomenon mentioned earlier of actively 'not wanting to know'.

Merely to imagine 'playing with your food' apparently unsettles the ordinary moral subject, who no longer easily keeps apart his or her experiences as meat eater and animal lover. These roles are now supplemented with a new role: an interspecies gamer who will have an experience of becoming pigpen enrichment, and will encounter an animal in a thoroughly new setting which we are normally not meant to enter. This moral subject that is playfully invited to involve him- or herself with the living conditions in intensive farming does not remain an outside observer, but is to some extent bodily and mentally immersed in the newly mediated interspecies relation.

One of the implications of the game design process is the active attempts to learn what animals like to do, and perhaps even to get a sense of what the world looks like to a farmed pig. But the potential implications are stronger than that. The intended co-evolutionary process instigated by the design could include risking our own current ethical and metaphysical sense of self, more broadly distributing the defining characteristics (play, tool use, technological beings) of humans that are often thought to demarcate us from animals.

Heideggerian dangers?

Or is the game a profoundly problematic Heideggerian type of technological world disclosure? Straddling the rather wide divide between conceptual artwork and agricultural technology, even physically shuttling between the intensive farm and the art school, the game project resembles both in vitro meat and the pig tower scheme. But if it becomes a fully operative agricultural technology, Playing with Pigs would no longer be merely an innocent, playful intervention in a public debate. Does the project, then, enlist both pigs and consumers in a 'total mobilization', exploiting

not just their bodies but even the entertainment value of pigs? Are we, then, producing a postmodern, ludic version of the Heideggerian *Gestell*, in which everything is to be made productive and useful – in this case playful and consumable? Are we perfecting a technocratic dystopia with a brand new totalitarian metaphysics of *gamification* that is not as open to vivid reflection as the various ‘rhetorics of play’ (Sutton-Smith 1997) may have it?

This is probably the general danger of trying to design for world-disclosive effect. As long as it is ‘merely art’, it is easily dismissed as somewhat elitist, perhaps fun, but ultimately irrelevant. It is in crossing the boundary to being real – an agricultural technology rather than a conceptual hoax – that its world-disclosive character comes out in full: in response to new technologies, many more people seem eager to reflect on and vent opinions. So somewhere between art and technology, as certain strands of play design are now, might be where the ideal genre for creative criticism is found: a genre that is inviting rather than accusing, leaves thinking (at least partly) to the audience but shapes experiences and associations in such a way as not to close down emerging meanings prematurely.

In the public responses to the project there were signs of people actively reflecting on the ways in which they become moral subjects.

“Personally, being ignorant to how these animals live and get slaughtered is what keeps me enjoying meat. I find the less I know, the happier I am. Playing a game with them, only to kill and eat them, I don’t know, I can’t help but humanize that idea, and how sick it sounds. But then again, I guess if you’re destined to death you might as well have some fun while you’re alive.” (‘DavidDoel’, comment at Crecente 2012)

In the case of in vitro meat, some people realized how their responses to new proposals and existing situations are the outcome of the status we are willing to grant to affective and bodily reactions: It sounds disgusting, but when you think of it, this would mean the end of animal suffering, etc. In this way, world-disclosing technologies allow us to actively rethink the nature of our moral subjectivity, which is then more openly the outcome of a process that alternates between culturally mediated, embodied, and affective responses to new things and efforts to cultivate a more formal, universalist moral self.

4 – Intensifying the co-evolution of ethics and technology

Co-evolution means, as we saw in the previous section, that (changing) technologies can offer moments of reflection in practice. But this is not only a matter of disclosing moral worlds in a public debate on spectacular proposals. It also happens locally, in seemingly more modest forms of designing and tinkering. In agricultural practice, the development and adoption of new technologies makes for moments during which central concepts get new meanings and farmers and others involved experiment with new modes of relating to animals and the environment, etc.

This implies not necessarily a kind of technological determinism, with devices inherently prescribing our focus of attention and generating a particular language to understand these changes. The pig game project could be seen to build upon several notions that were elaborated to understand the process of the co-evolution of ethics and technology in the development of milking robots. This type of farm technology was found to give rise to new ethical understandings and priorities (for instance the robots providing freedom for cows) and to motivate socio-technological development processes in which conceptual deliberation and material tinkering are integrated, processes in which the animals and farmers play an active role, while changing themselves along with the technological system.

In the case of the milking robot, its development could be described to some extent in terms of a shifting character of animal practices, from caring for cows to allowing them to care for themselves, a process that could perhaps be understood as moving towards forms of naturalness, or perhaps even a degree of wildness. These reimagined animal practices serve as a background to intricate conversations between farmers about slight changes in the technological arrangement of the farm. The analysis of the shifting focus and the meaning of animal welfare in dairy farming, from the tie stall to the mobile milking robot, showed that a notion of 'improved' or 'best' animal welfare is always dependent on contexts, involving a choice of parameters and particular interpretations of a situation. In the case of pig farming, there is a broader consensus on the problematic welfare status of pigs in barren housing without adequate enrichment. However, some indeterminacy is part of the meaning of naturalness (e.g. Segerdahl 2007) in relation to the high-tech or otherwise 'artificial' enrichment of pig housing.

As in the case of the milking robot, infusing farm practices with more technology may seem to promote a distancing of humans and animals, leading to alienation for

both. For the farmers who we worked with on the video game, at least in the phase of development this was not necessarily the case: the design project not only puts the designers in a position to try and gain rapport with the animals, but the farmers with whom we collaborated started to look more closely at the play behaviour of their pigs.

The cultural character of farmed cows and pigs

There are differences between dairy cows and fattening pigs. It's tempting to say that cows work, while pigs play (even though this distinction is culturally laden and can be deconstructed, as we saw in the previous chapters). While the cows seem to be getting ever more cut off from direct human interaction with the advent of new technology, the pig game project aims to increase pig-human interaction, albeit of a mediated kind. For cows, the earlier transition to loose housing (and the associated increase in scale) not only involved the loss of horns, as I discussed in chapter 2. The accompanying increase in herd size also meant the loss of their names in exchange for gaining freedom of movement. Previously, Dutch dairy cows were given names such as 'Antje 3', or 'Bertha 7', indicating their breeding lineage while also providing a sense of them being part of the family. Until the 1950s it was not uncommon for dairy farming families to have dinner in the same space as the cows. Nowadays, besides the often-heard framing of high-yielding dairy cows as 'professional athletes', cows can be seen as robot operators, which could lead to an understanding of their moral status as 'workers'. This may have particular implications for their perceived right to animal welfare, chiming with a sense of mutual obligation between human and animals that is common amongst dairy farmers.

One hypothetical way of using a mobile milking robot that the group of farmers in chapter 5 discussed was farming dairy cows in nature reserves, involving little interaction with a farmer and further shifts in moral obligations and meanings of care. Moving in the opposite direction to this form of 'dairy herd de-domestication', or perhaps even *rewilding*, the meaningfulness of individual pig-human relations might be publicly established again. This is significant in the light of the ongoing process of increasing scales and automation that has reduced the farmer's time budget per animal to nearly nil. Will the pigs that play well be given names too? And will they respond to these, as the cows used to do?

The question that comes up here is to what extent we can, and should, promote co-evolution 'by design'. Can we do this on purpose? And do we then intervene from some kind of preconceived idea of what a good way to relate to pigs is? How can we

relate to actively trying to reset the terms of debate and to making farmers and the wider public look at pigs anew? The way forward would be to consider the ethical question not as something we should answer from the outside but from inside the design practice. Then these ideas are to be developed during design process, and by imagining and experiencing other designs, such as the work of Jeremijenko, as discussed in chapter 7. The explicit awareness of entering into techno-moral co-evolution may create opportunities for moral imagination, as farmers, designers, and human players can have a kind of back-and-forth experience of moving between two situations: farms with or without a game connection.

5 – Playful animal deliberation

The game design is meant to create a new space for relating to domesticated animals between ‘dominance and affection’ without idealizing the lives of pets either (cf. Tuan 2004; Smith 2003). But can playing with pigs also be considered as part of a material politics of more-than-human deliberation? The pig game is no cat flap, the ultimate liberating – and also problematizing – device for putting human-feline relations on a new footing; though our game is meant to create a similar kind of Montaignean wonder about animal motives and inner lives, rather than providing certainty about their mental abilities and moral status. And like the cat flap, playing with pigs could reveal unexpected behaviours that require interpretative work (also) on the human side. These interpretive efforts will to some extent always remain inconclusive, even necessarily so, while they also involve reconsidering our ideas about our human selves.

Instead of searching for overarching generic norms, we can instigate ethical inquiry and political deliberation not just by contrasting different (animal) practices, such as nature conservation and dairy farming, but by merging them into one practice, which is not so easy to ethically evaluate and position oneself in relation to. After initial dismissal and reluctance when we started explaining the game idea, several farmers who were willing to discuss it started to describe the individual differences of their pigs. They came up with anecdotes about clever ones unlocking gates and hacking the automated feeding system. These farmers appeared to have been looking closely at their animals already, not merely for their health status and growth rate, but also seeing them as playful and creative creatures. Surely, many farmers also told us that their pigs are only interested in food. But our efforts are

meant to explore whether this is indeed the case, and if so what it means for what we can make of the character and interests of pigs.

The *Pig Chase* design concept furthered the kind of intervention that was experimented with via the photomontage of the mobile robot in the premodern cattle painting. Both were attempts to make people contemplate whether forms of human–animal relations and animal use can be rendered coherent in new ways, and whether or how the meaning of (an idealized) traditional life with animals could be transposed to a contemporary high-tech environment. This type of inquiry is not to be situated only on some kind of conceptual level. The design process generates a sustained questioning of what the character of the responses is to various material interventions: Will it be truly play? Both the design and the eventual gaming require the continual interpretation of the meaning of moves and mutual attuning of movements and patterns of behaviour. Ideally, a situation can be created for interspecies interaction that enables the experience of the subjective character of animals in new ways. A situation in which questions that are partly philosophical can also be explored, such as what is play, and when are we meaningfully interacting with another species?

Does this really amount to something that could be called ‘deliberation’ in a multispecies democracy? Surely, most existing definitions of deliberative democracy exclude active participation of animals in any type of political process. But the common reluctance of acknowledging an active and meaningful presence of animals in our strictly human political manoeuvring, even in nearly all political and moral theory that is motivated to end or alleviate their suffering, remains striking.

Designing for and with pigs as active beings to some extent gives them a voice. Or at least does more than granting them ‘the right to remain silent’. It is good to be aware of Holloway’s (2007) Foucauldian critique of the discourse surrounding the milking robot as liberating cows and allowing their true bovine subjectivity to come out. This means that domesticated animals who, due to their neoteny, are more eager to play than their adult wild brethren, should not necessarily be regarded as alienated from their true selves, victims of their own ‘false consciousness’. But whether the intensively farmed and feed conversion ratio optimized landrace pigs actually are as playful as they look, and whether their behaviour amounts to what we feel play is all about, should not be assumed at the outset. However, when we see the game design (in terms of the ‘later’ Foucault) as working on ‘techniques of the self’ through which both humans and perhaps pigs can experiment with emerging subjectivities in

mutual interaction, this might be a good starting point for experimenting with alternative open-ended situations in which animals may reveal new abilities and desires.

What claiming the 'deliberative' label did, in a pragmatic sense, was to remind us to aim for a high standard of 'participatory' design, which is open to accord meaning to surprising animal behaviours; which acknowledges ambiguity in the meanings we may attribute to these behaviours; and which also intends to put our own assumed status – as players, designers, communicators, moral and political beings, and humans – at stake. And in the case of play¹²⁵ design, more than with robots that are aimed directly at productivity, the agency of animals can be more easily recognized as not just resisting, bargaining, and negotiating, but as part of material processes in which we mutually adapt and learn to live together. With the centrality of play in (especially contemporary) culture, it is more obvious that animals as responsive and learning creatures 'have' culture and can partake in a shared one with us.

Will designing games with them allow us to deliberate with pigs on the acceptability of farming them? This is rather challenging, of course. But engaging in a non-discursive process of mutual adaptation and learning might be as good as any other method for grappling with this question, especially when this is done in public and also involves broad human audiences. The game design and its continued development can be a new way of integrating work into animal sciences, animal ethics, and philosophy of mind. Animals may then gain a voice besides their interests being represented by experts and arguments thought up by philosophers on their behalf.

¹²⁵ Even though 'games' could be seen as reinvigorating this sense of discrete individuals behaving in response to others and within fixed structures of rules and preset goals, it is not for nothing that most people in the field prefer to talk about 'play': an activity that is (even) more difficult to define and one that is more open, experimental, and ambiguous. Play thus is a term that implies a less prefigured sense of the nature of agency as not primarily goal directed and self-affirming, nor necessarily means thinking in terms of winners and losers, etc. The Pig Chase concept combines elements of both – offering an opportunity for merely moving together, while also providing goals and registering 'high scores'.

10.3 Pitfalls and prospects

Pigs are cute?

When portraying pigs as benign, funny, and playful creatures, this is at odds with common experiences of pig farmers. Especially after farmers were called upon to stop castrating male piglets, I have heard pig behaviour being discussed in a very different vein. Early experiences with uncastrated pigs raised the idea of the pigs having an inherently evil character. There is talk of ‘gang rapes’ by boars. This is in line with earlier stories of farmers being eaten after suffering from a heart attack in the pen.¹²⁶ So, for the farmers, the game’s meaning includes providing a possible way to control a potentially deeply aggressive animal. By providing enrichment and other interventions to improve the pigs’ situation, farmers may find this aggressive character of pigs to be at least in part the result of circumstances, perhaps exacerbated by their inbred genetic predisposition to be hungry. As with the purported lazy cows in relation to the milking robot, the design process may generate a to-and-fro of interpreting causal linkages between animal behaviour and the way in which they are kept.

The status of experience, skill, and situatedness

Situating ethics with farmers does not imply that skilful handling automatically confers legitimacy to everything they do. Some farmers take pride in the efficient way they are able to castrate piglets, which does not necessarily make it a benign procedure. Nor should we focus on farmers because they somehow, in a crude phenomenological sense, have full and direct access to reality. Taking seriously the moral experiences and imaginations of farmers may be a matter of becoming too embedded, of ‘going native’ by accepting common practices that could also be considered deeply problematic. Emphasizing everyday lived experience to get at what is important and learning how to deal with that does not provide a solid (however subjective and transient) basis for moral and epistemological or even ontological claims. Experiences tend to be limited to a certain place and material arrangement and within a particular time frame. Think of the ‘shifting baseline syndrome’ (Pauly 1995) that commercial fishermen have been described as

¹²⁶ When you stand in the middle of a pigpen, such as during the testing of the game prototype, pigs quickly grow accustomed to your presence and start nibbling harder and harder on your legs. This tends to lead farmers and other human visitors to engage in a kind of dance to gently but firmly keep the pigs at bay.

suffering from, as they tend to compare current fish stocks with catch levels when they started fishing, not with those of one or two generations earlier.

Nevertheless, it does mean that the skills and experiences of farmers are an important site of ethical intervention. And that intervening will need to involve a deliberative process in which their experiences are taken seriously. Experience, feelings, and rationality are all to be considered as part of the processes of co-evolution. These can be historicized, because they too are situated and contingent. Ethics then becomes a matter of seeking out particular experiences, in an ongoing search for how to relate to future selves and others. Seeking or creating particular experiences entails a focus of ethical attention. Thus, *Playing with Pigs* has highlighted questions surrounding animal welfare, animal use, and human–animal relations. By drawing attention to the boredom and cognitive potential of the animals, their welfare in the form of their subjective experience is presented as the central issue for the public to contemplate before eating them. A further (design) challenge for this approach will be to widen its focus to include, for instance, making present and urgent the environmental effects of intensive farming.

Situated, but more than local

The ideal of situated ethics, on the farm, does not mean that everything can only be understood and best solved locally, informed only by the idealized local knowledge of inherently wise farmers. We also need ways to generate moral experiences of how local choices have effects in sites across the globe. Problematic situations then need to be connected in new ways to faraway places. Moreover, the moral intricacies of situations can often be appreciated better when informed by the perspectives of outsiders, as they are positioned in what is commonly considered to be the viewpoint of a critical look. Ethical reflection is, then, ideally a back-and-forth movement between inside and outside, between immersion and distance, and between experiences of flow and of disruption; a process in which new technologies may generate ‘breaching experiments’¹²⁷ that provide new experiences of existing practices, confronting us with normative orders implicit in everyday situations. At the same time, these previous modes of doing and understanding should not be immediately discarded in the name of innovation.

¹²⁷ A disruptive technique of sociological inquiry developed by Harold Garfinkel (1964) as a form of ‘ethnomethodology’, aiming to foster an imaginative look at taken-for-granted, everyday background expectations, in order to demonstrate: “the extent to which normative order penetrates the moment-to-moment accomplishment of situated social actions” (Lynch and Peyrot 1992, 114).

What we have seen throughout the thesis is that when one delves into the grave issues in farming more closely, these no longer appear in the shape of the familiar, straightforward ‘techno-ideological’ dilemmas between organic and intensive farming, large- and small-scale production, family and corporate farming, local and global sourcing, and high-tech and traditional modes of production. Instead, what appears to be a more interesting way to deal with core concerns is to make new combinations of these (seeming) oppositions. Rather than performing static analysis and principled positioning, we can experiment with alternative ways to integrate, or at least muddle, these entrenched dichotomies: with low-yielding cows that are robotically milked while dispersed in nature reserves; with artisanal in vitro meat, with large-scale high-tech organic farms. And when we look at ‘the making of’ these kinds of things, it becomes clear that we are unlikely to directly implement new ways of agricultural production from particular techno-moral blueprints that aim to save the world generically. It would be more helpful to inform innovation processes by a mode of ethics that is hands-on and co-evolving. Ethical concerns then enthrone heterogeneous communities to find new ways of doing better – without defining at the outset what better would be, nor leaving this evaluation to a single type of expertise and bureaucratic ordering.¹²⁸

We do not have to give up all of our more generic and overarching moral commitments. Occasionally we may want to stick to hard-nosed principles and guiding visions. And this type of approach will not always be an all-round friendly affair with only win-win solutions. Sometimes, agonistic understandings of politics in which consensus is hard to reach – and should not even be aimed for – may be important as part of a process of inquiry, especially when we believe ourselves to defend the *subaltern* against the powerful. Rather than collectively muddling through and finding a middle ground, some will argue that taking firm, uncompromising positions is essential to achieve results that are, for instance, beneficial to the environment and more just.¹²⁹ Merely gradual change, which leaves

¹²⁸ See for instance (Bos and Grin 2008; Elzen et al. 2012) for examples of agricultural design efforts that shuttle between formulating ends in the form of blueprints and adjusting these during phases of practical realization.

¹²⁹ The debate about GMOs might be a case in point in which principled opposition to more open forms of ‘experimenting’ with new technologies was successful in making several political arguments and preventing powerful interests from pushing through a particular agenda without critical accountability. Although, even in this case, it could be argued that more muddled and complex understandings of forms of genetic interventions in organisms could have informed a more interesting societal debate or learning process; A learning process which currently seems to develop anyway but largely outside of the public view.

current animal production as it is, will not suffice to seriously engage with the mosaic of moral challenges that intersect at contemporary sites of animal farming. But, also in these situations, learning to deal with what matters is still likely to be a learning process – ideally with some kind of deliberative character – rather than a one-off decision to ‘do the right thing’.

This thesis is guilty of promoting a different set of reductive dichotomies: situated vs abstract ethics, material vs discursive forms of politics, and writing philosophy texts vs visually and materially intervening in practices. These dichotomies are, however, not meant to stifle debate in new ways, but to instil creative tensions and offer provocative frames for reflection. These may help to unsettle existing ideas on where to situate ethics (or how to see it as situated at all) and how to interpret material forms of politics (instead of assuming it to be discursive only).

How can we view the ‘impacts’ of the Pig Chase game concept?

Can we valorize and assess this type of intervention in public debate, or perhaps even measure its effects quantitatively? Even though pigs also responded to our prototyping and play-testing, leading us to reconsider our ideas of what an interesting game for both pigs and humans could be, the emphasis of the *Pig Chase* project –most notably in the concept video– has thus far been on unsettling human understandings of pigs and our relations with them. Besides tracing discussions on the web that comment on our project, we did not conduct a survey or use some other comprehensive social science method to try and measure the (lasting?) impact of the project on human attitudes or behaviours. One reason for this is that the project is not aiming to realize a particular behavioural change. There is not a single moral solution to the issue of pig welfare that motivates the project and that people would need to be nudged towards. But neither is the aim merely one of ‘raising questions’ or ‘making people think’. Even though in themselves these can be venerable goals which are commonly aimed for by societally critical (bio-) art, it would be a pity to leave it at that. Artists and designers mostly try to stay clear of moralizing because they fear that it will make their work one-dimensional. Explicating moral intent, they think, would undermine the ambiguous and unsettling character of their work. The challenge of how to be critical of existing practices without ‘giving all the answers’ right away can be taken on by more explicitly envisioning the kind of experiences and symbolic associations the intervention is to generate. Otherwise, the work in the name of ‘merely raising questions’ could slide into ‘readying’ the minds and bodies of the general public for new technologies, as

described by Kockelkoren (2003). After too many light-emitting GM bunnies, the public reception of new technologies might be numbed into plain acceptance.

Another way to understand the aim of this intervention is as increasing the quality of public debate – a classic legitimation of moral philosophy. Here, this was not attempted by bringing conceptual clarity into a semantically chaotic field, but by creating particular new, meaningful experiences, thereby involving new kinds of people to reflect on and express their ideas on the issue, and by heightening a sense of complexity amongst those responding to it. The design approach to more-than-human politics in itself offers no guarantee about what we may feel makes ethical contemplation and political deliberation meaningful and deep. It is possible to imagine people playing some game with pigs as unreflectively as most people buy meat and dairy products in a supermarket. Nevertheless, the web discussions that emerged after the *Pig Chase* video went public revealed a broad impact when we consider the sheer variety of positions and quite original argumentations. Most interestingly, many people who self-identified as having a particular and culturally well-established position on the issue –farmers and vegans– expressed uncertainty and ambivalence.

As we saw in chapter 6, others responded in even more internally conflicted ways, raising interesting questions about what it means to be a moral subject in a changing technological culture. This is also what seems to emerge from follow-up research into public responses to in vitro meat in collaboration with Cor van der Weele (Van der Weele and Driessen 2013). People relate in complex ways to their own positioning, especially in view of collective norms, expected cultural shifts, and ‘future selves’. This means that to study ethics in co-evolution as part of processes of transition, we should move beyond individuals reporting on their current values and attitudes in a simple model of individual behavioural change.

Moral agency in co-evolutionary tinkering and the role of philosophy

With the game design itself constituting a form of philosophical inquiry into ethics, here centring on how to make the pigs emerge and establish a new human-pig relation, what role does a philosopher still have? The idea takes us in uncertain directions, especially since the project and its societal effects are, to a considerable and unknown extent, unmanageable. The project is no longer just a philosophical PhD thesis in which the author and supervisors can be thought to control every step of the argument (though how a thesis is read is not fully controlled either, of course). About a dozen people over the past few years have, in various ways, been

actively involved in realizing and building upon this idea to try and realize an interspecies game, including some, mostly sceptical but sometimes very enthusiastic, farmers and equally sceptical and curious, though very unruly, pigs. After publishing the idea of playing with pigs, a media frenzy sprung up in which we had to reinvent ourselves and the project time and again, on the spot, constantly grappling to readjust our ideas and design depending on the variety of responses.

This dilution of my agency is not to say I won't be willing to take responsibility for the outcomes and try to adjust our project in the light of criticism. (You see, there is still moral agency in this flux, perhaps even more so than if this thesis would have been the outcome of a struggle with literature only!) Interactions with material realities and being influenced by others do not diminish moral autonomy, but actually contribute to it, because the moral identity we live with is not a stable thing, but requires constant challenges and improvisation. Or, as Mark Coeckelbergh has argued, ethics is a matter of 'growing moral relations', an inherently situated, embodied, and relational exercise, in which becoming a moral subject is a matter of ongoing immersive learning (Coeckelbergh 2012).

Is it just art, or is it for real?

However, it is still unclear what the status of the game design project is. Is it just art, a one-off concept video, and thus in a way a 'hoax'? Or do we mean to actually realize it, and even scale it up to implement some version of it on multiple farms? The *Pig Chase* project has been heralded as an example of 'how art can save the world' (Gevers 2013), which seems to frame it as a one-off, evocative piece of art. But it also was featured in a recent book on 'Sustainism', as an example of 'Sustainist Design for Social Change', that contributes to a 'culture of connectivity' by bringing people into contact with the places in which their food is produced (Schwarz and Krabbendam 2013). When at this book launch event I saw the images of our pigs equipped with their giant touch screen next to a different project called 'Fairphone', which aims to make smart-phone production more ethical and just,¹³⁰ a rather disconcerting moral world was disclosed. It suddenly dawned on me that it would be not just ridiculous but profoundly sickening to provide confined pigs with iPads assembled by exploited Chinese factory workers and for which the source materials were dug up by Congolese mining slaves. The project would manage to link the destruction of the Amazonian rain forest for growing pig feed with fuelling civil war

¹³⁰ See: <http://www.fairphone.com> (accessed 2 February, 2014).

in Africa and polluting the environment in China, potentially affecting not only the lives of pigs and people the world over, but even contributing to the destruction of the habitats of mountain gorillas. Ludically enhanced intensive farming would thus integrate global suffering, exploitation, and environmental destruction in new and unimagined ways.

Design as social movement and public debate

The juxtaposition of *Playing with Pigs* and the series of moral concerns connected to IT products can of course also be considered as an occasion to develop a fair version of *Pig Chase*, possibly in collaboration with Fairphone. That would help us realize that even though farms are obviously fascinating sites, we may find occasions for imaginative material deliberations elsewhere too. In practice, the aim of producing a smartphone without exploiting workers or destroying the environment faces immense challenges in relation to both logistics and politics, as it runs into all kinds of legal as well as practical barriers. Thus, the Fairphone project reveals the systematic but also sometimes the merely unreflective and unimaginative reasons behind morally problematic realities the world over. The Fairphone developers explicitly do not define their goal of global justice of a production chain based on some kind of *Ten Commandments* of fairness. Instead, the aim of fairness is seen as a process, a matter of ongoing learning and deliberation. This process involves navigating a series of interrelated technical challenges in relation to conceptual, regulatory, and practical concerns – while at the same time co-evolving with a moral consumer who is learning what is possible to morally demand and what these demands entail in practice.

Another example of creative design that is part of the social movement as outlined in the *Sustainist Design* guide, is the ‘outdoor brewery’ by artist Henriette Waal. This is an on-site installation for brewing beer using local surface or ground water, which invites people to ‘taste their landscape’. The brewery provides an experience that helps us contemplate not just the water quality around us, but also place-bound characteristics that we can actually taste, thus generating new forms of meaning and connectedness. Seemingly, this is a much more mundane approach than the radical extrapolations and unsettling proposals such as high-rise pig farms and *Playing with Pigs*. On the other hand, the act of drinking surface water – purified as part of the brewing process but still offered ‘at your own risk’ – is, as an actual experience, more radical than it may seem at first sight. It creates a moment to actively relate to the (suspected) intake of heavy metals and hormones (thus connecting to environmental concerns of animal farming too!). This project also shows how this

type of design practice does not need to be digital and high-tech, but can just as well be based on a technology which was invented at the dawn of our civilization.

These are just two further examples that allow for new forms of imaginative and perhaps embodied connections with the myriad environmental and social concerns that come with our patterns of consumption and land use. Similar to the *Playing with Pigs* project, these both function as mere concepts, on a very small scale, while also potentially having a wider influence on economic and policy sectors due to actually being taken into production; in both cases catalysing imaginative rethinking of our situated moral concerns.

Personal motivation for doing philosophy, or, in defence of the ridiculous

Some people writing on issues such as those discussed in this thesis are motivated by compassion, or even moral outrage – or at least a strong sense of moral right and wrong – which they then try to back up and further refine by theorizing. Others have a more neutral stance, trying to sort out reasons and arguments in coherent sets and offering conceptual analyses of the central terms. Some even look for ways to somehow ‘ground’ these arguments on some abstract general idea: a single theory that would provide the basis of our moral judgments. Their formative experience may be one of wonder, or challenge, and the joy they get from trying to think through various lines of reasoning is sometimes compared to that of solving puzzles. My own work on these themes does share some of these two motivations and modes of working. The formative experience, however, is a slightly different one. Besides an interest in how people generally manage to relate to central questions in their lives, this work is also motivated by a sustained experience of the ridiculous nature of many human strivings, a ridiculousness which is exacerbated when these strivings are pressed into the mould of academic philosophy. This has implications for the kinds of arguments one deploys, the modes of inquiry one uses, and the style of writing one works in. Mostly, philosophical work on ethics is quite a serious genre (apart from the hilariously far-fetched thought experiments that are often presented as prime examples of moral cases). There seems to be a widespread sense that if something is funny, or meant to be so, it is not only an inappropriate way to relate to the grave issues we are faced with, but thereby also irrelevant as a mode of thinking.

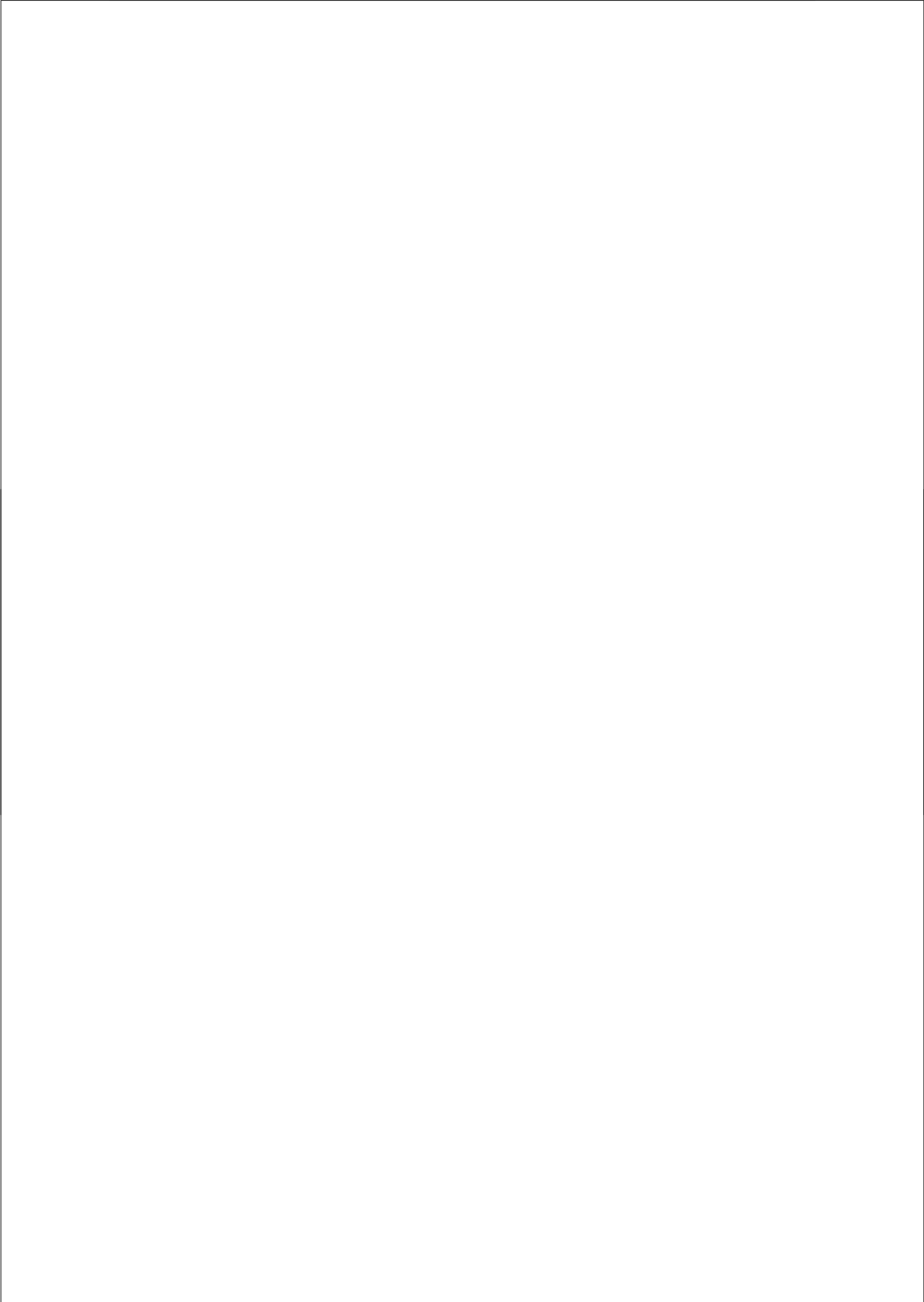
Humour, jokes, pranksterism, and ethics thus seem not to be a felicitous match, at least in understandings of ethics as a solemn affair that asks serious questions about real problems involving harm, suffering, and issues of life and death. Our *Pig Chase* concept video tends to raise laughter when screened before a fresh audience. One

thought-provoking critique I received after presenting the pig project at an international multidisciplinary animal conference was that it was profoundly wrong to be laughing at the sight of intensively confined pigs. Thus, the project is indeed a matter of navigating around the dangers of merely turning the whole question of pig farming into something to laugh away. Nevertheless, when the experience of ridiculousness is appreciated as a potentially thought-provoking and even 'world-disclosing' force (cf. Critchley and Cederström 2010), then ethics without any reason to smile seems dry and not connected with the full character of human (and animal?) interaction and thought.

Or is this opting to tell a bad joke when it is impossible to explain a situation (Foer 2010, 91)? Let's end on a more sincere note, then. My own experiences in the intensive farming landscape of the Netherlands was somewhat different to those depicted in the *depri-kino* documentaries discussed in chapter 1. Yes, there is the sense of alienation when entering a chicken shed for the first (and second) time and making 10,000 broilers hurry to the far side. A critical sense developed further when I was cycling through the Brabant countryside with the stinging smell of ammonia emerging every few hundred metres from anonymous, windowless sheds, a smell that makes you wonder about the environmental effects of concentrating millions of pigs in a small country. Or a sense of sadness emerges when, clad in white overalls and plastic shoe covers, we were walking past endless rows of pigsties, and the farmer says: "There is no point in also taking a look in the other hallway, they all look the same." Or at a dairy farm, seeing shaky calves of a few days old individually housed in a row of white plastic 'igloos' next to the barn where their mothers were milked. They seemed both curious and scared, peeking out of their individualized compartments, sometimes suffering from anaemia because of being withheld iron-rich feed, or having stomach problems due to not being given enough roughage, as they would be transported to a calf-fattening farm shortly. And then there are the heavy trucks with animal feed that pass along the road behind the Wageningen Social Sciences department every few minutes, transporting a seemingly endless amount of (perhaps) Amazonian soy to the intensive chicken production 'valley' nearby.

But when I was cycling through Friesland at dawn, on the way to breakfast after having milked 60 cows, the sense of being productive in rhythms aligned with those of other living beings, however forced and exploited they perhaps may be, and the idea of sharing in this work life with these cows seems to make the practice meaningful in itself. This may have offered a glimpse of an experience of farming

practices which brings down questions of ethics to whether and how the role of farmers in relation to their animals, the local environment, and global food production can be considered somehow meaningful and perhaps even benign.



Epilogue

Back on the pig farm

The farmer who once joked of using a Nintendo Wii as enrichment material in the pigpen was rather surprised when I phoned two years later to say that I had gone on to realize her idea. Since we first met at her kitchen table, she and her husband had sold off the old farm, which was in the middle of a small town, and relocated to a so-called agricultural development area (*Landbouwontwikkelingsgebied*). These areas have been designated as part of a national rezoning effort meant to concentrate intensive farms in sites where the impacts on nature and local residents would be reduced. The farmer couple was seeking ways of creating a completely new farm, which they came to realize would also involve setting up their own product marketing and outlet. In their new barn, which will be filled with straw and will provide pigs with the opportunity to go outdoors, they have already prepared a space for a game to be installed.

When one of the game designers and I visit her in 2013, the barns are still empty, as the neighbourhood had protested against the plans of having pigs outdoors. There are a few pigs though. Next to the house, a small field is fenced off, where four pigs have managed to uproot every inch of soil. When we come closer they scurry around through the mud, making grunting sounds. We agree with the farmer that these animals cannot be put back into an intensive farm situation. She and her husband have not decided yet whether these will eventually go to the butcher, or will be allowed to stay, as enthusiastic representatives of the future inhabitants of the site; quartermasters, radiating joyful piggishness to the neighbours. Besides setting up the farm again, a serious challenge to get our game to work on site seems to be the lack of high speed internet in rural areas.

Recently, a major multinational farm equipment manufacturer has also shown an interest in our project. The innovation manager, a biologist and the head of software

development came over to the Netherlands for a talk to explore possible collaborations. Their first question was: 'Is this just art, or is it real?' This type of company has historically been instrumental in the industrialization of animal production and can now be thought to represent the status quo of global intensive farming. At the same time, its business model requires them to look further ahead than most others in the farming sector. Already, they had been contemplating the 'pig farm of 2030'. And they have a sense that societal concerns about animal use need to be taken into account – at least in Western Europe.

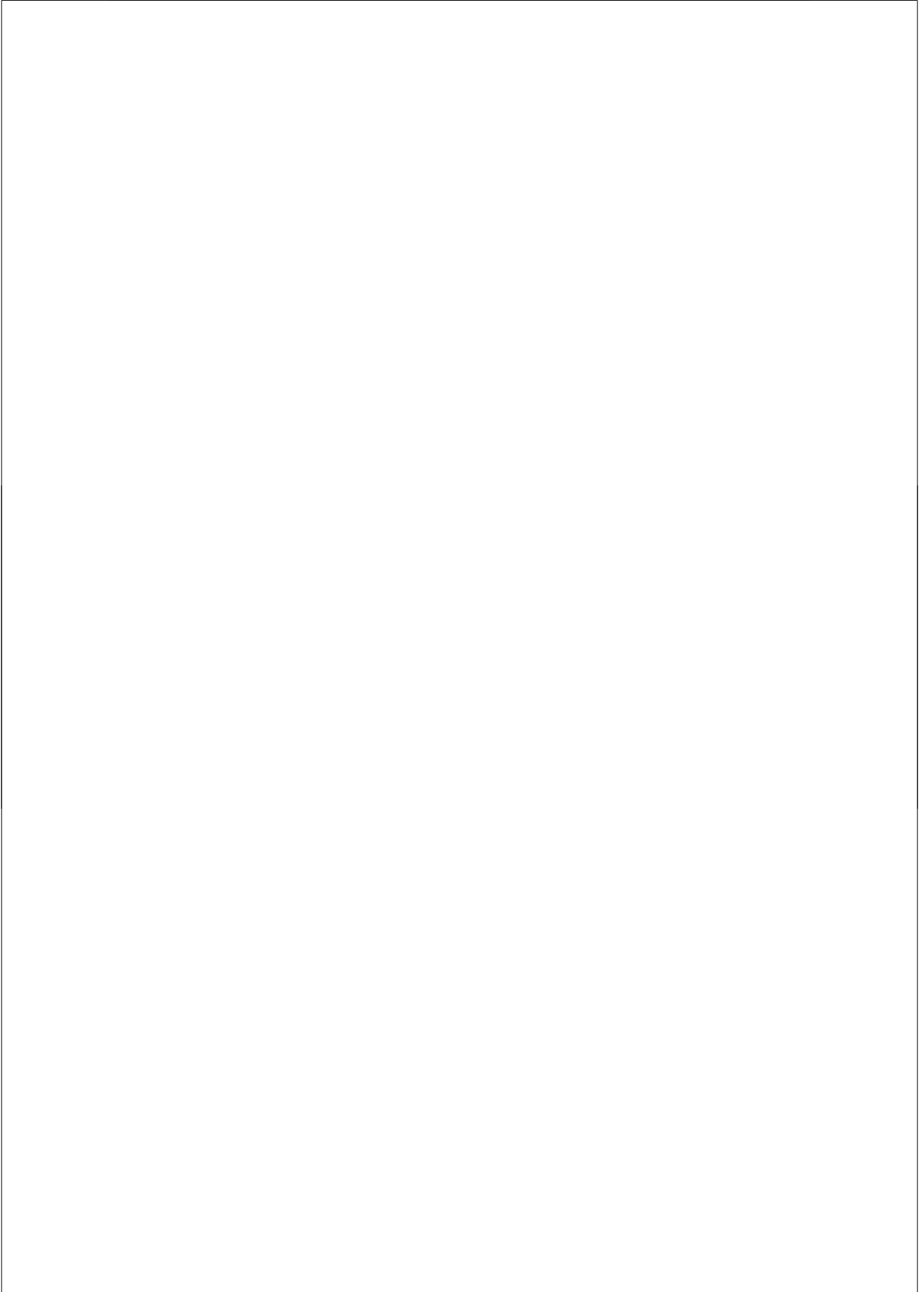
When playing with pigs would be part of a larger *system innovation* in which broader environmental and animal issues are addressed, its ongoing development could also help promote a view of design as a process in which pigs, as intelligent and learning creatures, can actively take part. In this way, the game project allows us to explore a dual track of both 'top-down' and 'bottom-up' technological design and economic change, fostering new lines of thinking, doing, and relating to consumers, animals, and societal debates.

So what is a meaningful role for philosophers on the farm?

It may be concluded from this thesis that ethics is everywhere on the farm, but that it requires us to appreciate modes of valuing and relating to moral concerns that are less common in other approaches to ethics and policymaking. And that it takes some immersion and some creativity to bring these forms of ethics out for public deliberation. The examples discussed in the thesis revealed that design may entail the emergence of particular moral subjects and new modes of ethical as well as political deliberation. Thereby it is clear that the opposition between 'moral agency' and 'technical fix' is not as clear-cut as often thought. And that technological innovation offers opportunities for political debate, rather than only being an unseen site of moral change. This means a kind of political debate that should then also be considered as of a material, situated, tinkering character. In this type of process, philosophers could play a role, if only to adapt existing ideas of ethics, politics, and expertise to what happens on the ground. But this type of work is close to and can be complemented by the possible roles of artists, designers, anthropologists, (more-than-) human geographers and similar more 'outgoing' types.¹³¹

¹³¹ Indeed, like the pig farmer, I have also moved and now work as a cultural geographer.





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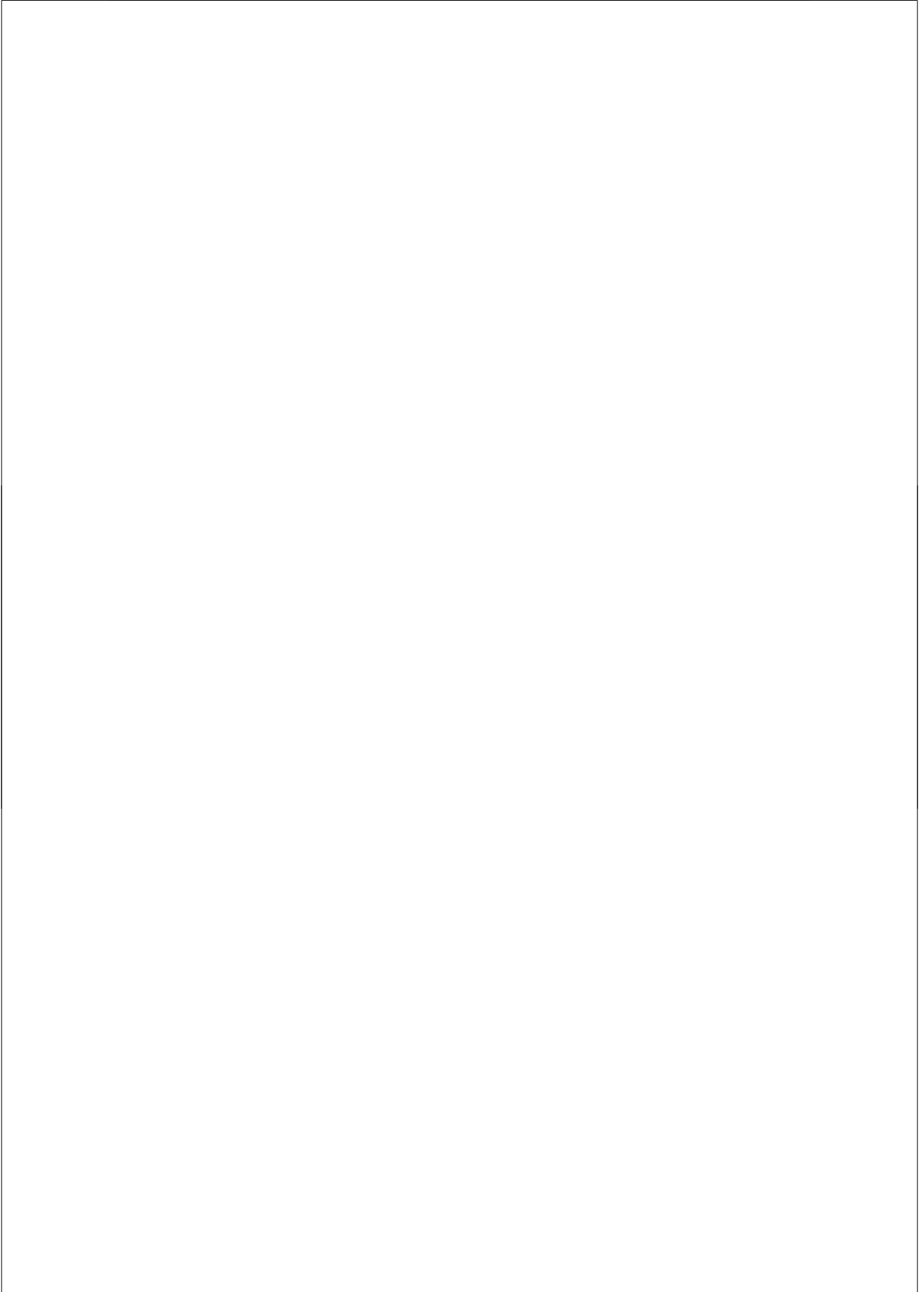
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Summary

Animal deliberation:

the co-evolution of technology and ethics on the farm

What can a philosopher contribute to understanding and debating ethical concerns regarding the farming of animals? This thesis starts with a **prologue**, which sketches the situation of someone asking himself this question at a pig farm while discussing the problem of pig boredom and how to meet the regulatory requirement of pigpen enrichment.

Animal farming is an increasingly problematic and contested activity. A mosaic of interlocking concerns, which is outlined in **chapter 1**, is becoming ever more prominent. These concerns include animal suffering, environmental pollution of water, soil and air, emissions that induce climate change, zoonotic diseases, antibiotic resistance, food risks, deforestation, global nutrient imbalance, eutrophication of marine ecosystems, depletion of scarce resources (including fossil fuels, phosphorous and fresh water), and issues of global justice, land use and hunger. Apart from these external effects, animal farming is meant to provide affordable, good quality, safe food that is healthy and tasty. This also involves working conditions on farms, farmers' incomes and rural livelihoods, the cultural value of agricultural landscapes, and the traceability of food for consumers. What stands out from this overview is the sheer variety of issues, as well as the range of institutions and scientific disciplines associated with regulating and assessing them.

The myriad of interconnected concerns –or even merely the plight of production animals– may suggest a rather simple and obvious ethical solution: the complete abolition of using animals to produce food. By situating ethics on the farm, this dissertation starts from the idea that it might be possible to retain forms of animal

production in a more or less sustainable world, with a perhaps acceptable amount of animal suffering. Nevertheless, even though it would involve hubris to take the role of global decision maker on this, the more radical solution to the whole pressing conundrum of animal farming does spring up in the thesis in various ways.

Who is to decide upon this ethical conundrum is unclear. One way in which, over the past decade, the wider public has learned about these concerns is through visually striking documentaries such as *Our Daily Bread*. From these, one may get a sense that humans are caught up in industrial food chains in which little moral agency or even subjectivity remains. Thereby a series of questions emerges that this thesis delves into: how to conceive of moral and political agency in our contemporary high-tech food system? Where to situate ethics and where to look for ethical subjects? And what genres of moral debate and philosophical inquiry are appropriate and helpful (or irritating and disruptive) for engaging with the concerns listed above?

The genre of applied ethics as a field of academic research tends to be geared towards certain types of institutional interventions – procedures, protocols, ethics committees, and policy advice – that imply a particular understanding of what it means to engage in ethics: namely the systematic, rational, and conceptually clear reflection on what right and wrong actions. Often this form of ethics involves explicating and weighing values and principles. However, critics of this type of ethical theorizing and reflection have pointed to how these approaches tend to limit the range of considerations that can be articulated and thus depoliticize situations while turning them into static dilemmas. On top of this, ethical arguments in this genre do not seem very convincing to consumers and farmers alike, just as merely listing the issues above does not result in wide societal change.

In practice, our ethical understandings of issues can be found to be influenced by the development of new technologies. This thesis is informed by recent work in pragmatist ethics and science and technology studies (STS) that highlights the ‘co-evolving’ character of moral norms in relation to technological change as a promising way to understand ethics in our technological culture. Ethics in philosophical pragmatism means a focus on the experience of ‘problematic situations’. Pragmatist ethical inquiry is not about justifying abstract and distanced positions but about embodied, active, and lively engagement in situations. Besides the rational, ‘prosaic’, problem-solving orientation that pragmatism is known for, there is also a ‘romantic’ or ‘poetic’ side to

pragmatist philosophy, which emphasizes the creative and ‘world-disclosing’ character of thought. In this form of pragmatism, ethics can be understood as an ongoing process of directing attention, offering rich interpretations of practices, cultivating moral experiences, and imagining alternative worlds. This thesis offers a range of experiments with genres of inquiry and intervention (such as ethnography, case studies, photomontage and game design) to find out how to involve particular moral subjects and promote possible modes of deliberating ethics on the farm.

The extensive ethical debates that have emerged on the various issues listed in chapter 1 tend to focus on single issues, such as animal welfare or environmental pollution. The views of farmers in these debates have been largely absent, or have merely figured as (increasingly marginal) interests, instead of being considered morally worthwhile in and of themselves. As an alternative to seeing ethical issues as mere challenges for technological optimization or as dilemmas to analyse in terms of ethical principles, **chapter 2** looks at ethics on the farm, offering an ethnographic exploration of the moral experiences of farmers. The variety of norms that figure in contemporary farming practices is systematically charted in terms of different forms of justification. Reviewing the practical arguments and commitments of farmers within this framework reveals that farming practices are subject to mixed motives, in which an amalgam of types of concerns plays a role. Farms are not just industrial sites for efficient food production, but also domestic places where farming families live, who can still be thought to have multifaceted relations to their animals and land.

When focusing on single issues, the full range of justifications in farming life comes across as an inefficiently muddled practice or even an ‘ethical chaos’. But when considered as an intricate mesh of societal domains and normative logics, the peculiarly entangled nature of ethics on the farm could be better articulated in public debates. A more encompassing description of particular issues, then, can be developed that does justice to the ways in which farmers integrate the mosaic of concerns, informed by a variety of moral experiences. This may counter the tendency in policymaking, technological innovation, scientific research, and ethical thought to compartmentalize our moral landscape.

Ethics then becomes an ongoing learning process in which considerations from multiple orders can play a role, and in which embodied forms of experience, skills, self-identity, and relations are part of the dynamic. Thus, questions about ethics on the farm can

rarely be expected to produce single, generically right answers, as these always involve interconnected ideas on what kind of farmer one should be, what a good life for an animal is, and how to relate to the land.

In **chapter 3**, the focus moves to technology. Whereas technological change is often considered as a threat to due democratic process and moral decision making, here it is argued that the co-evolution of ethics and technology is a prime opportunity for political and moral engagement. Two technological projects that proposed to do away with farms and farmers and the public reception to these proposals are analysed: schemes for pig farming in high-rise 'agro-production parks' that came to be known as 'pig towers' (*varkensflats*), and efforts to develop techniques for producing meat by growing cells outside of animals, labelled 'in vitro meat'. Rather than assessing the possible pros and cons of these proposals, this chapter focuses on the dynamic ethical processes they instigated. By closely examining how features of these designs entered public debates and ethical thought, this chapter traces the moral 'world-disclosing' character of technological projects.

First of all, even before being realized systems or commercially viable products, these two technologies functioned as fresh occasions for debate. Not just on whether to accept the proposed technology or not, but also on the wider issue they were meant to intervene in. These debates occurred in very different settings from the ones where agricultural issues usually tend to be discussed, and they involved people other than the usual suspects. On the one hand, new coalitions sprang up around the new technologies, such as those between farmers and urbanite protesters and between biotechnologists and vegans. While on the other hand, rifts occurred within existing organizations, such as animal rights organizations and environmental NGOs.

Secondly, both designs gave rise to shifts in understandings of the existing societal issues that surround farming. While imagining these newly proposed alternatives to farming practices, implicitly new benchmarks by which to judge the existing situation arose. Both pig towers and in vitro meat revealed contemporary intensive meat production to be, in many ways, inefficient and suboptimal. System boundaries were redrawn, and particular kinds of arguments emerged with each technology. Analogies between intensive farming and the holocaust suddenly became mainstream in response to the pig towers. Whereas high-rise pig farms produced a collective public refusal to seriously discuss the proposal, in vitro meat was much less controversial, making the

issue primarily into a subjective question of whether or not one would like to eat it. In discussing the design proposals, even ontological shifts could be seen to occur in relation to what is to be considered 'real meat' and the 'true nature' of animal farming.

And thirdly, responding to these new technologies involved a renewed sense of the character of political and moral agency, while the sensibilities that constitute a moral subject in relation to an issue were also rethought. This involves ideas on what are deemed appropriate sensibilities and a shifted appreciation of embodiment, emotions, experience, and the relevance of particular moral commitments. For instance when learning to relate to the physical disgust that for some is aroused by the thought of in vitro meat.

The chapter contemplates the inner tensions and ambiguities of this process of moral and political change by confronting the different understandings of *world disclosure* developed by Dewey and Heidegger. Part of the critiques of both the pig towers and in vitro meat tend to align with the Heideggerian dismissal of modern technology on metaphysical grounds: as a wrong kind of thinking' that turns everything, including ourselves, into mere resources. With Dewey, however, we can point to how these proposals could be considered part of an experimental form of creative inquiry, which in a dramatic way integrates technological design, scientific research, and artistic imagination. The influence on public debate and the (moral) imagination of these technologies can be viewed as akin to that of the arts, making artistic design a way to relate actively to world disclosure and processes of co-evolution. But even though all kinds of societal actors gathered to discuss these designs –and thus also conventional farming– in heated and sometimes constructive debates, there was very little (pig towers) or no (in vitro meat) role for farmers. Their experiences, ideas, and knowledge were implicitly defined as obsolete, at best only part of the problem.

Chapter 4 brings us back to the farm again, to see how co-evolution takes place not just in public debates evoked by spectacular designs, but also in more mundane material processes of technological change. Milking robots, which are little known to the wider public, have, over the last decade, become increasingly used on Dutch dairy farms. At first it seemed to be a small technological step of automating the attachment of the teat cups of the milking machine to the udders of the cows. But in practice this has been found to entail a complete reorganization of dairy farming. The ethical implications and evaluation of this device are not self-evident, but are themselves part of a dynamic

process in which what is considered a good farmer, a good cow, and a good robot can be seen to shift.

This chapter explores the question of how to engage in ethics from a relational and fluid understanding of humans, animals, and technologies. Based on interviews, attending farmers' network meetings, taking a brief practical training course in dairy farming, and studying professional literature and web forums, the co-evolution of ethics and technology is described in detail. With a robot, cows are no longer milked twice a day by the farmer, but instead must voluntarily present themselves to be milked individually. This means they need to lose some of their herd mentality and decide for themselves when it is time to be milked. At the same time farmers need to learn to leave these decisions to the cows in such a way that they remain productive. In the wake of implementing this robot on farms, an ethical norm of (individual) freedom or even autonomy for cows has gained ground. This is not only part of the marketing rhetoric of robot producers. Even critics of the robot formulate their concerns in these terms: it is argued that the robot is not as liberating as promised, or only promotes a particular idea of freedom and subjectivity.

Farmers who install a robot gradually find out that 'robot cows' really are different. This means that in practice, animal welfare is not easily defined in generic terms, but also depends on contexts and relations. Thus, what a cow is, and how best to relate to her, is the outcome of ongoing processes of socio-technical change.

'Robot farmers' changed too. They no longer have routine interaction with the cows but move to a regime of management by exception. Whereas automation is generally thought to lead to deskilling of labour and alienation, what farmers found out was that they developed a more calm and friendly relation with their cows, who no longer associated the farmer with being milked and pushed around. With the robot, an ideal of 'not interfering with the herd' emerges, which means that the farmer leaves more to processes in the herd, while the robot changes these. Thereby the responsibility of the farmer is thought to shift from caring for the animals towards allowing the animals to take good care of themselves. Similar to the cases in the previous chapter, here too the dynamics of ethical evaluation involves changing the terms of debate and the subjectivities of, in this case, both farmers and cows. At the same time – in true co-evolutionary fashion – we see how these new roles and ethical norms feed back into the material layout of the robot in the barn. Farmers now tend to move away from earlier

set-ups with 'forced cow traffic' that required them to pass the robot to get to the feed, offering instead opportunities to (in some sense) more freely determine their behaviour.

Embracing co-evolution and doing away with stable norms and more formal modes of moral critique involves the risk of losing ethical ground and giving up critical terms such as 'natural', 'autonomy', 'freedom', 'exploitation', and 'alienation'. On the one hand, these terms can indeed be found to lack stable meanings in a dynamic technological culture. But on the other hand, this chapter argues that, through being contested, these terms are still vital in making sense of the changing experiences and moral commitments of farmers.

Chapter 5 also uses the example of the milking robot. But rather than merely expanding the description of co-evolution in the previous chapter with further details, it is written in a more argumentative style: as a kind of manifesto for appreciating the active role of animals as political beings with whom we engage in 'animal deliberation'.

There is a growing interest in not just the moral but also the political status of animals. This raises a challenge of how to conceive of animal politics both in theory and in practice. Against the common assumption that animals 'have no voice' and that being somehow represented by humans is all they can hope for, this chapter develops an understanding of deliberative democracy which acknowledges existing forms of political communication across the species barrier. The chapter introduces the idea of design as political and designing with animals as deliberative via a simple domestic technology: the cat flap. This everyday example already shows how people and domestic cats negotiate and probe their human–feline relations. When technological design is understood as a process of tinkering with our ideas of the good life and appropriate human–animal relations, then designing for and with animals can be appreciated as a kind of multispecies learning processes that could be accorded political status.

The chapter follows a group of farmers and technologists who, together with a small herd of dairy cows, over the course of several years experimented with a mobile milking robot that would milk cows out in the pasture. Again, a seemingly simple adjustment of a technology entailed a complex dynamic. Technical challenges in making this new device work and having the cows perform productively were mixed with what in ethical theorizing would be considered conceptual questions on the centrality and appropriate meanings of naturalness, freedom, voluntariness, and farmer responsibility. These were

not taken up as questions to be answered purely or primarily on a discursive level. Various practical meanings of these notions were experimented with by creating new material arrangements and watching the subsequent interactions. Continually, the character of the cows is subject to interpretation by the farmer: to assess whether they are genetically 'lazy' or do not receive the right feed, whether they are too stubborn or not intelligent enough to visit the robot, or whether they dislike being forced towards it and would rather decide for themselves when to enter it. The process of tinkering or *bricolage* revealed how in situations of technological innovation a responsive relationship emerges of mutual learning, in which both farmer and animal subjectivities are continually redefined and delineated.

The theory of deliberative democracy emphasizes that the political process is not to be thought of as an encounter between individuals with given preferences, but as something that encompasses their formation. Recent theorists of deliberation stress that it is a style of politics which is grounded in everyday experiences and that deliberative forms of interaction can be found in unexpected sites. Acknowledging the active and meaningful role of animals and appreciating that these everyday, partly material and non-discursive processes are of a deliberative kind may contribute to taking animals seriously in public debates over how to farm, manage, conserve, or liberate at least a number of hitherto ignored members of our political community. By recognizing the interdependence, reciprocity, and inherent ambiguity in our dealings with animals, and in theirs with us, we can experience a call for an inquisitive, experimental, and ongoing politics of everyday animal encounters.

In an **intermezzo**, the author of the thesis again finds himself sitting with a group of farmers. Similar to the situation sketched in the prologue, but this time at a dairy farm discussing the mobile milking robot. Rather than offering conceptual analysis and trying to make the farmers internalize particular notions to make them understand the ethical character of what they are doing, he started experimenting with a different, more evocative, visual approach.

In **chapter 6** we return to the pig farm and to the EU requirement for pigpen enrichment that aims to diminish pig boredom and prevent pigs from biting each other's tails. When spectacular technological proposals can publicly disclose moral worlds, and when implementing farm technologies can lead to animal deliberation on the farm, then a promising way both to study and to intervene in this situation is to design an evocative

farming technology. Extrapolating the requirement for pigs to receive something to play with, a project is outlined to create video games to entertain them. This in itself could be a way to draw attention to the welfare situation as well as the cognitive potential of pigs. But it is even more interesting to try to intervene in human–animal relations by creating a game that would allow the pigs to play with humans.

This project connects debates on animal use and animal welfare with John Berger’s idea of the ‘disappearance of the animal’ in modern culture, where “only pets and carcasses remain.” Playing with pigs, moreover, offers a way to actively explore recent debates on alternative modes of scientifically understanding animal cognition and behaviour, such as those discussed under the banner of ‘multispecies ethnography’.

This chapter describes a first game concept, for which the designers created a (partly mock up) video: *Pig Chase* connects humans and pigs by enabling them to together move a sparkling dot over a screen in the pigpen and on an iPad. The evocative character of this intervention in public debate entailed that we did not fully control or even imagine its possible meanings and full potential for rethinking human–pig relations. Therefore the variety of responses the project has already generated is used to outline the kinds of implications that ‘playing with your food’, as the project was labelled in the popular press, could be thought to have.

Chapter 7 probes the extent to which the design of playing with pigs can function as a subversive intervention vis-à-vis existing animal practices such as farming and pet keeping. Questions that are dealt with in the design process concern the ideal of naturalness, the hierarchical ranking of species based on cognitive abilities, notions of symmetry in human–animal relations, and the character of play defined in terms of openness. Ideas concerning these themes were partly conceived at the outset of the project as design criteria, to ensure that animals during the design process and in the eventual game emerge as meaningful and active participants. These themes are further elaborated here, informed by work on human–animal relations and discussions of new modes of doing research into animal behaviour that allow or even call for an active human presence. But these themes are also the core issues that we have been grappling with in the design process. The focus here ultimately comes down to the question of what it means to play and the peculiar character of interspecies play.

By in-depth discussion of particular design choices for the first prototype of the game, which we are currently testing, the chapter explicates the way in which the process of design can function as a form of multispecies philosophy: as both a material and a discursive way of investigating interlinked ethical, philosophical, and scientific questions on how we could (and perhaps should) relate to pigs.

The next **chapter, 8**, offers further speculations on the moral character of this type of mediated intervention, in the light of historical processes of co-evolving moralities and genres. In the ongoing reflections on the design process and the potential impacts of the experience of interspecies play on human and nonhuman players, questions regarding human (moral) subjectivity are found to be deeply intertwined with the issue of how to conceive of (animal) minds. Thus, this chapter explores how an understanding of morality as co-evolving with particular cultural genres such as novels, film, or video games, can be thought to resonate with alternative forms of relating to animals. A series of discussions on human–animal relations is brought into connection with oppositions such as those between empathy and sympathy, and those between liberal ideals of individuation vs post-humanist commitments to the primary relationality of individuals, human or otherwise. Ultimately, it is argued that the tension generated by these oppositions, which are found to be central in envisaging the experience of (premodern) farmers and animals, comes down to whether or not we can distinguish between touching and being touched. The chapter ends by taking seriously the accusation made by numerous (online) commentators that the project is deeply problematic, or even disgusting and perverse. With that we (re)turn to the question of the potential for a multispecies community in our technological (farming) culture.

The conclusion of this thesis is that we should go to farms, talk to farmers, live with animals and design new farm equipment as the best way to do agricultural ethics. But when tinkering in practice is the ideal, is it not strange to argue for this in written words? **Chapter 9** springs from a sense of wonder about the self-defeating character of writing a long winding academic treatise that is meant to argue that ethics actually happens in material practices on the farm. This is the paradox of writing pragmatist ethics: when viewed pragmatically, all that writing and reading about situated experience, embodied practices and the importance of standing with your feet in the mud actually turns us into brains on sticks. The inescapable subtext of a PhD thesis seems to be that true knowledge and ethical arguments are written in academic prose.

After contemplating the various implicit effects of writing and language as the commonly assumed mode of engaging with ethical concerns, the thesis argues that fully disbanding with words would go too far. Language and writings can inspire and critique creative material practices, in a back-and-forth between reading and tinkering. Just as theoretical discussions informed the making of *Pig Chase* and vice versa; as long as it is clear that deploying the alphabet is not a neutral choice in doing ethics, and material practices are taken seriously as form of ethical reflection too.

This chapter ends with the idea that the point of the thesis can best be understood as to show, not tell. The least self defeating way to conclude is then by showing how the Playing with Pigs design project itself, as a situated and material endeavour, can be considered to be the conclusion to this theoretical and practical research.

Chapter 10 indeed tries to refrain from making general claims. Nor does it offer a set of tools for policy makers. Instead, this chapter looks back at how the various earlier chapters informed the pig game design project and how that could help us understand, in a hands-on way, processes of co-evolution between technology and ethics on the farm. The chapters of the thesis can be seen as attempts to generate enthusiasm for joining in deliberations understood in ever more expanded ways: including farmers and their embodied practices, radical technological designs, tinkering with farm technologies, animals as active participants in this, and creative design as a way to actively relate to this process.

Next to the evocative genres, which we have discussed, that call for action on environmental and animal issues, interspecies video game design was explored as a new mode of creating interesting situations for moral experience, reflection, and debate. In the game project a different moral subject, beyond citizen and consumer is invited and generated, opening up a new genre of engaging in ethics by involving us in affective relations.

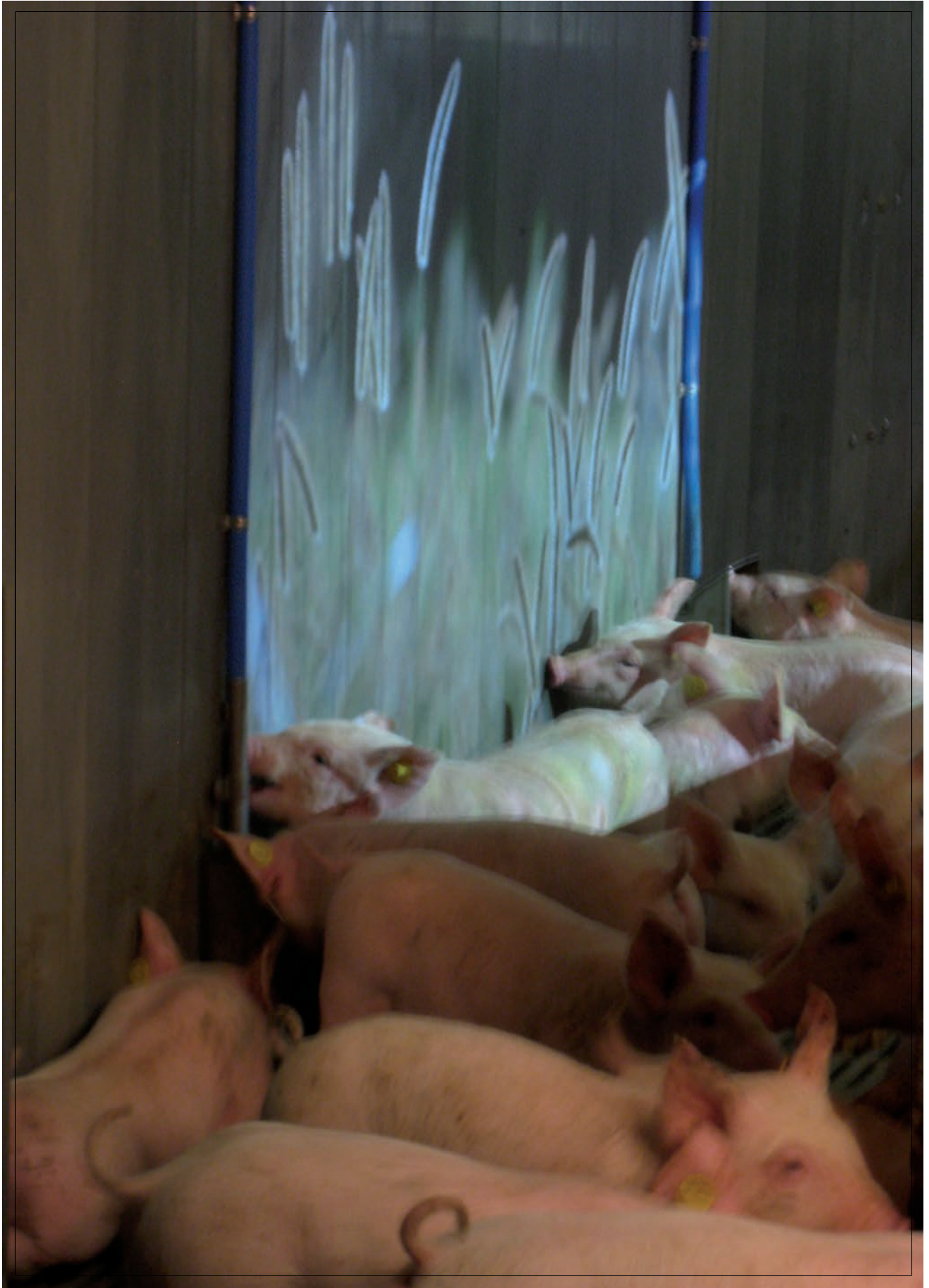
The proposed design does not come with a claim to be morally neutral. Instead, it aims to intensify the experience of ambivalence with regard to animal farming, combining industrial food production and ideals of meaningful human-animal interaction of contemporary pet keeping. In the design project, the process of socio-technical co-evolution is used to intervene and study the way technological change generates occasions for debate, new understandings of an issue and of what it means to be a

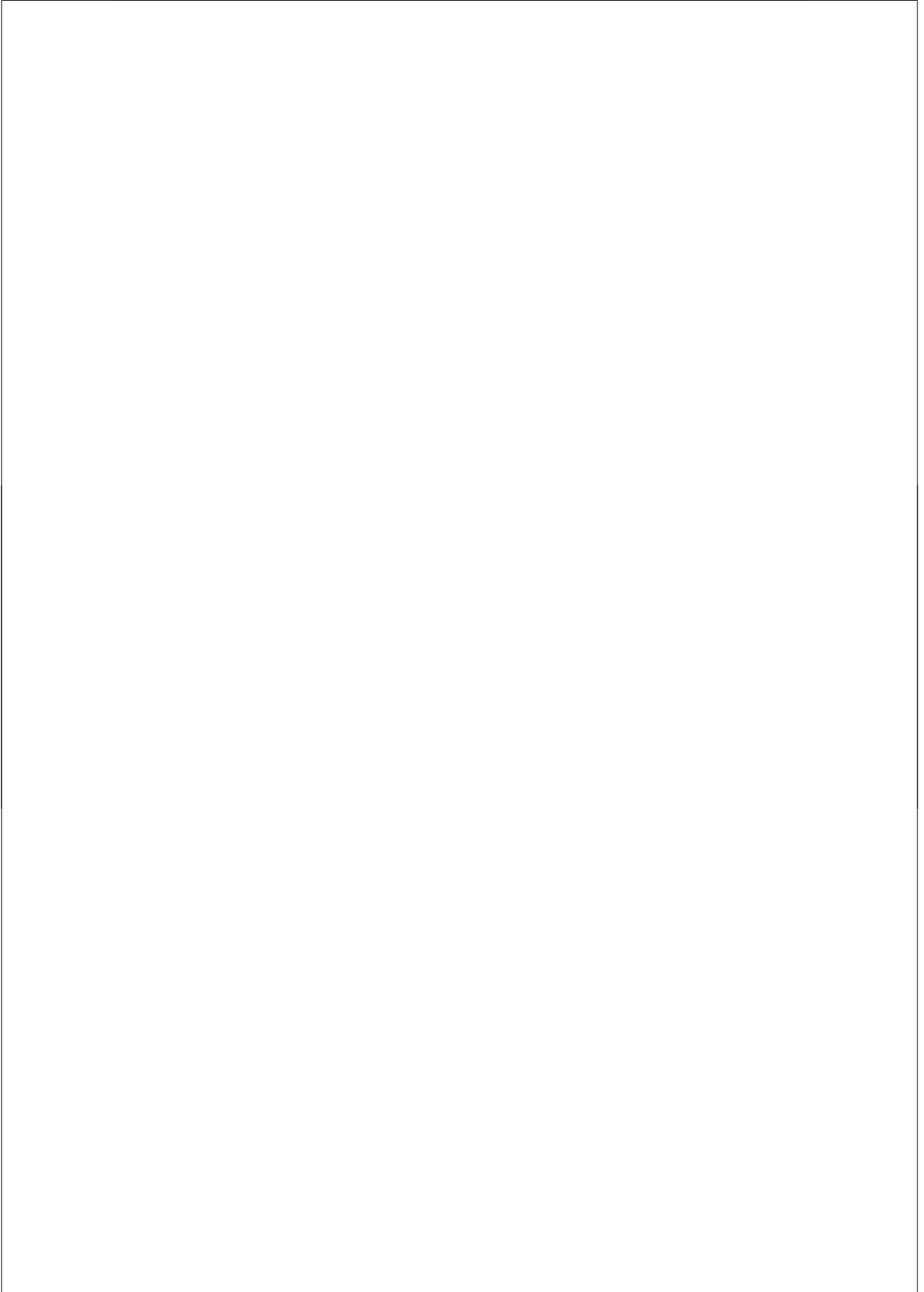
moral subject in relation to producing food with and from animals. Rather than offering a purely technological fix, or succumbing to technological determinism, this type of design means actively relating to co-evolving norms, including shifting meanings of central terms. What it means to play, and what the moral meaning of mediated play with other species could be, can be contested in the light of this project.

We set up our design intervention explicitly as an experiment with new human-animal relations, which involved developing new sensibilities and increasing our responsiveness to animal behaviour. This made it evident to grant animals a serious role as co-designers. In the process we became more responsive to their behaviour while developing various ways to interpret its meanings. As we were interactively reimagining life on the farm and ways to connect that to wider audiences, the game project was envisaged as a platform for 'animal deliberation'.

It can be challenging to locally engage with issues that cannot be fully grasped by situated experience. There does not seem to be a generic answer to this type of concern. To do ethics in a co-evolutionary vein we can indulge in inspiring examples of artists and designers. In order to open up our sensibilities to forms of suffering and increase our imagination of the way local situations are connected to global concerns – concerns which themselves are always also local and are not to be solved solely from afar.

In the **epilogue** we revisit the pig farmer of the prologue, who in the mean time had been radically altering her farm.





Samenvatting

Deliberatie met dieren:

de co-evolutie van technologie en ethiek op de boerderij

Wat kan een filosoof bijdragen aan het begrip van en debat over ethische kwesties rondom de veehouderij? Dit proefschrift begint met een **voorwoord** waarin de situatie wordt geschetst van iemand die zich dit afvraagt op een varkensboerderij tijdens een discussie over het probleem van verveling bij varkens en hoe te voldoen aan de vereiste van hokverrijking.

Het gebruik van productiedieren is een in toenemende mate problematische en omstreden activiteit. Een mozaïek van onderling verbonden zorgen, geschetst in **hoofdstuk 1**, komt steeds meer onder de aandacht. Deze zorgen betreffen het lijden van dieren, milieubelasting van water, bodem en lucht, emissies van stoffen die leiden tot klimaatverandering, uitbraken van voor mensen gevaarlijke dierziekten, antibiotica resistentie, voedselveiligheid, ontbossing, onbalans in de wereldwijde verdeling van nutriënten, eutrofiëring van water ecosystemen, het opraken van schaarse grondstoffen (waaronder fossiele brandstoffen, fosfaten, en zoet water) en kwesties aangaande wereldwijde rechtvaardigheid, landgebruik en honger. Buiten deze effecten, is veehouderij erop gericht om betaalbaar, kwalitatief en veilig voedsel te produceren dat gezond en lekker is. Hierbij komt ook nog de kwaliteit van arbeid op boerderijen, het inkomen van boeren en de leefbaarheid van het platteland, de culturele waarde van agrarische landschappen en de traceerbaarheid van voedsel voor consumenten. Wat opvalt bij deze opsomming is de grote variatie aan kwesties en de diverse instituties en wetenschappelijke disciplines die betrokken zijn bij het reguleren en beoordelen ervan.

De overdaad aan onderling verbonden kwesties –of alleen al het lijden van productiedieren– suggereert een even simpele als voor de hand liggende oplossing: de volledige afschaffing van het gebruik van dieren voor voedselproductie. Met het

situëren van ethiek op de boerderij vertrekt dit proefschrift vanuit de gedachte dat het mogelijk is om bepaalde vormen van dierlijke productie te realiseren als onderdeel van een min of meer duurzame wereld, met een wellicht aanvaardbare hoeveelheid dierlijk lijden. Desalniettemin, ook al zou het nogal overmoedig zijn om hieromtrent de rol van wereldwijde beslisser in te nemen, de meer radicale oplossing van het urgente algehele vraagstuk van de veehouderij komt her en der in het proefschrift op verschillende manieren naar voren.

Wie zou moeten beslissen over dit vraagstuk is onduidelijk. Een manier waarop in het afgelopen decennium een breder publiek met deze zorgen werd geconfronteerd is door in het oog springende documentaires zoals *Our Daily Bread*. Op grond daarvan zou je het gevoel kunnen krijgen dat mensen gevangen zitten in industriële voedselketens, waarin weinig ruimte voor moreel handelen of zelfs morele subjectiviteit overblijft. Hiermee komt een reeks vragen op waar dit proefschrift mee aan de slag gaat: hoe kunnen we de morele en politieke handelingsruimte opvatten in ons hedendaagse hoogtechnologisch voedselsysteem? Waar kunnen we ethiek situëren en waar moeten we op zoek naar morele subjecten? En welke genres van moreel debat en filosofisch onderzoek zijn geschikt en nuttig (of irritant en ontwrichtend) om met de zorgen die hierboven werden opgesomd aan de slag te gaan?

Het genre van de toegepaste ethiek als terrein van universitair onderzoek is veelal gericht op bepaalde soorten insitutionele interventies –procedures, protocollen, ethische commissies en beleidsadvies– die een specifiek begrip impliceren van wat het betekent om ons met ethiek bezig te houden: namelijk de systematische, rationele en conceptueel heldere reflectie op juiste en onjuiste handelingen. Vaak gaat het in deze vorm van ethiek om het expliciteren en afwegen van waarden en principes. Critici van dit soort ethisch theoretiseren en reflecteren hebben er echter op gewezen dat deze benaderingen de diversiteit beperken van het soort overwegingen dat kan worden gearticuleerd. Iets dat kan leiden tot het depolitiseren van situaties en het omzetten ervan in statische dilemma's. Daarbovenop lijken de ethische argumenten die dit genre voortbrengt niet erg overtuigend voor consumenten noch boeren, net zoals het slechts opsommen van de kwesties hierboven niet zomaar resulteert in brede maatschappelijke verandering.

In de praktijk blijkt onze ethische kijk op kwesties te kunnen worden beïnvloed door de ontwikkeling van nieuwe technologieën. Dit proefschrift bouwt voort op recent werk in

pragmatische ethiek en wetenschaps- en techniekonderzoek (STS) waarin het 'co-evoluerende' karakter van morele normen en technologische verandering wordt uitgelicht als een veelbelovende manier om ethiek te begrijpen in onze technologische cultuur. Binnen het filosofisch pragmatisme gaat het bij ethiek om de ervaring van 'problematische situaties'. Pragmatisch ethisch onderzoek is niet zozeer gericht op het rechtvaardigen van abstracte en afstandelijke posities maar op belichaamde, actieve en doorleefde betrokkenheid bij deze situaties. Naast de rationele, 'prozaische', probleemoplossende gerichtheid waar het pragmatisme om bekendstaat, is er ook een 'romantische' of 'poetische' kant van pragmatische filosofie, waarin de nadruk ligt op het creatieve en 'wereld ontsluitende' karakter van denken. In deze vorm van pragmatisme kan ethiek worden gezien als een voortdurend proces van het richten van aandacht, het leveren van wijdlopijge interpretaties van praktijken, het cultiveren van morele ervaringen en het verbeelden van alternatieve werelden. Dit proefschrift biedt een reeks van experimenten met genres van onderzoek en interventie (van etnografie, case studies, en fotomontage tot het ontwerpen van computerspellen) om uit te vinden hoe specifieke morele subjecten kunnen worden betrokken en hoe mogelijke vormen van morele deliberatie op de boerderij te bevorderen.

De uitgebreide ethische debatten die zijn opgekomen rond de verschillende zorgen opgesomd in hoofdstuk 1 zijn doorgaans gericht op losse kwesties, zoals dierenwelzijn of milieuvervuiling. Het perspectief van de boer is hierin meestal afwezig, of komt slechts voor als een (steeds marginaler) deelbelang, in plaats van te worden gezien als in zichzelf moreel relevant. Als alternatief voor het kijken naar ethische kwesties als louter technische uitdagingen of als dilemma's te analyseren in termen van ethische principes, richt **hoofdstuk 2** de blik op ethiek op de boerderij. Dit hoofdstuk biedt een etnografische verkenning van de morele ervaringen van boeren. De verscheidenheid aan normen die voorkomen in hedendaagse boerenpraktijken wordt hierin systematisch weergegeven in termen van verschillende vormen van rechtvaardigen. Het via dit kader beschouwen van de praktische argumenten en inzet van boeren laat zien dat boerenpraktijken onderwerp zijn van gemengde motieven, waarin een combinatie van soorten zorgen een rol speelt. Boerderijen zijn niet alleen industriële locaties voor efficiënte voedselproductie, maar ook huiselijke omgevingen waar boerenfamilies leven, van wie je nog altijd zou kunnen denken dat ze veelzijdige verhoudingen hebben tot hun dieren en land. Wanneer we ons richten op losse kwesties komt het volledige spectrum van rechtvaardigingen in het boerenleven over als een onefficiënte rommelige praktijk of zelfs een 'ethische chaos'. Maar wanneer we deze beschouwen als een fijnzinnig web

van maatschappelijke domeinen en normatieve logica's, zou het eigenaardige verweven karakter van ethiek op de boerderij beter worden verwoord in publieke debatten. Een meer omvattende beschrijving van specifieke kwesties kan dan worden ontwikkeld die recht doet aan de manieren waarop boeren de mozaïek van kwesties samenbrengen, geïnformeerd door een diversiteit aan morele ervaringen. Dit zou mogelijk de neiging binnen beleidsontwikkeling, technologische innovatie, wetenschappelijk onderzoek en ethisch denken om ons morele landschap te compartimentaliseren kunnen tegengaan.

Ethiek wordt dan een voortgaand leerproces waarin overwegingen uit verschillende ordes van rechtvaardiging een rol kunnen spelen en waarin belichaamde vormen van ervaring, vaardigheden, identiteiten en relaties onderdeel zijn van veranderingsprocessen. Je kan dan maar zelden verwachten dat ethische vragen op de boerderij eenduidige en algemeen geldende antwoorden opleveren, aangezien deze altijd zijn verbonden met ideeën over wat voor soort boer je zou moeten zijn, wat een goed leven voor een dier is, en hoe ons tot het land te verhouden.

In **hoofdstuk 3** verschuift de aandacht naar technologie. Terwijl technologische verandering vaak wordt beschouwd als een gevaar voor democratische processen en morele besluitvorming, wordt hier beargumenteerd dat de co-evolutie van ethiek en technologie bij uitstek gelegenheid biedt voor politieke en morele betrokkenheid. Twee technologische projecten die voorstelden om boerderijen en boeren af te schaffen worden bekeken: plannen om varkens te houden in grote 'agro productieparks' die bekend werden onder de naam 'varkensflats', en pogingen om technieken te ontwikkelen waarmee vlees kan worden gemaakt door cellen te laten groeien buiten dieren, onder de naam 'kweekvlees'. In plaats van de mogelijke voor- en tegens van deze voorstellen te analyseren, gaat het in dit hoofdstuk om de dynamische ethische processen die zij in gang zetten. Door nauwgezet te onderzoeken hoe kenmerken van deze ontwerpen werden opgenomen in publieke debatten en ethisch denken, volgt dit hoofdstuk het morele 'wereld ontsluitende' karakter van technologische projecten.

Ten eerste, zelfs nog voor zij gerealiseerde systemen of commercieel levensvatbare producten zijn, functioneerden deze twee technologieën als nieuwe gelegenheid voor debat. Niet alleen over het al dan niet accepteren van de voorgestelde technologie, maar ook over de bredere kwestie waarin deze waren bedoeld om in te interveniëren. Deze debatten vonden plaats in hele andere omstandigheden dan waar landbouwkwesties gewoonlijk worden bediscussieerd, en er waren anderen dan de

gebruikelijke deelnemers bij betrokken. Aan de ene kant ontstonden nieuwe coalities rond de nieuwe technologieën, zoals tussen boeren en stedelijke protesteerders, en tussen biotechnologen en veganisten. Terwijl aan de andere kant bestaande groepen verdeeld raakten, zoals dierenrechten- en milieuorganisaties.

Ten tweede gaven beide ontwerpen aanleiding tot verschuivingen in hoe de bestaande maatschappelijke kwesties rondom de veehouderij werden begrepen. Door deze nieuw voorgestelde alternatieven voor veehouderijpraktijken in te beelden ontstonden impliciet nieuwe standaarden om de bestaande situatie mee te beoordelen. Zowel varkensflats als kweekvlees onthulden dat de hedendaagse intensieve vleesproductie op allerlei manieren inefficiënt en suboptimaal is. Systeemgrenzen werden opnieuw getrokken en specifieke soorten argumenten kwamen naar voren met de beide technologieën. Analogieën tussen intensieve veehouderij en de holocaust werden plotseling door velen gebezigd in reactie op de varkensflat. En waar deze een collectieve publieke weigering om het voorstel serieus te overwegen voortbracht, was kweekvlees veel minder controversieel, met als voornaamste onderwerp van debat of men het al dan niet zou willen eten. In de discussie over deze ontwerpvoorstellen konden zelfs ontologische verschuivingen worden ontwaard ten aanzien van wat we zouden moeten zien als 'echt vlees' en de 'ware aard' van de veehouderij.

En ten derde bracht het reageren op deze nieuwe technologieën een hernieuwd idee over het karakter van politiek en moreel handelen, terwijl eveneens de gevoeligheden die een moreel subject vormt in relatie tot een kwestie werden heroverwogen. Dit betrof ideeën over wat passende gevoeligheden zijn en een verschoven opvatting over belichaming, emoties, ervaring en de relevantie van bepaalde morele posities. Bijvoorbeeld bij het leren om zich te verhouden tot de fysieke weerzin die voor sommigen wordt opgeroepen door de gedachte aan kweekvlees.

Het hoofdstuk doordent de interne spanningen en ambiguïteiten van dit proces van morele en politieke verandering door een vergelijking van de betekenissen van 'wereld ontsluiten' zoals die door Dewey en Heidegger zijn beschreven. De kritiek op zowel varkensflats als kweekvlees is meestal in lijn met de Heideggeriaanse afwijzing van moderne technologie op metafysische gronden: het zijn uitingen van een verkeerd soort denken dat alles, onszelf inclusief, tot slechts hulpbronnen maakt. Met Dewey kunnen we daarentegen wijzen op hoe deze voorstellen kunnen worden beschouwd als onderdeel van een experimentele vorm van creatief onderzoek die op dramatische wijze

technologisch ontwerp, wetenschappelijk onderzoek en artistieke verbeelding in zich verenigt. De invloed van deze technologieën kan worden gezien als vergelijkbaar met de kunsten, waarmee artistiek ontwerpen een manier is om ons actief tot wereld ontsluiting en processen van co-evolutie te verhouden. Maar ook al kwamen allerlei soorten maatschappelijke groepen samen om deze ontwerpen –en daarmee dus ook gangbare veehouderij– op vaak verhitte en soms creatieve wijze te bediscussiëren, er was een zeer kleine (varkensflats) of geen (kweekvlees) rol voor boeren. Hun ervaringen, ideeën en kennis werden impliciet weggezet als achterhaald, hoogstens onderdeel van het probleem.

Hoofdstuk 4 brengt ons weer terug op de boerderij, om te zien hoe co-evolutie niet alleen plaatsvindt in publieke debatten in gang gezet door spectaculaire ontwerpen, maar ook in meer alledaagse materiële processen van technologische verandering. Melkrobots, die nauwelijks bekend zijn bij een groter publiek, zijn het afgelopen decennium meer en meer in gebruik genomen op Nederlandse melkveebedrijven. In eerste instantie leek het een kleine technologische stap om het aansluiten van de melkmachine op de uiers van de koe te automatiseren. Maar in de praktijk bleek dit een volledig nieuwe opzet van het melkveehoudersbedrijf met zich mee te brengen. De ethische implicaties en beoordeling van dit nieuwe apparaat spreken niet vanzelf, maar zijn onderdeel van een dynamisch proces waarin verschuift wat wordt gezien als een goede boer, een goede koe en een goede robot.

Dit hoofdstuk verkent de vraag hoe we met ethiek aan de slag kunnen gaan vanuit een relationeel en veranderlijk begrip van mensen, dieren en technologieën. Op basis van vraaggesprekken, het bijwonen van boerennetwerkbijeenkomsten, een korte praktijkcursus melkveehouderij, en het bestuderen van professionele literatuur en webfora, wordt de co-evolutie van ethiek en technologie gedetailleerd beschreven. Met een robot worden de koeien niet meer tweemaal daags gemolken door de boer, maar moeten zij zichzelf vrijwillig individueel melden bij de robot. Dit betekent dat zij een deel van hun kudde mentaliteit moeten kwijtraken om voorzichzelf te beslissen wanneer het tijd is om gemolken te worden. Tegelijkertijd moeten boeren leren deze beslissingen aan de koeien over te laten op zo'n manier dat zij productief blijven. In het kielzog van het installeren van de robot op boerderijen heeft een ethische norm van (individuele) vrijheid of zelfs autonomie van koeien terrein gewonnen. Dit is niet slechts onderdeel van de verkoopretoriek van robotproducenten. Zelfs critici van de robot formuleren hun bedenkingen in deze termen: er wordt gesteld dat de robot niet zo bevrijdend is als

beloofd, of slechts een bepaald idee van vrijheid en subjectiviteit bevordert. Boeren die een robot in gebruik nemen komen er gaandeweg achter dat 'robotkoeien' daadwerkelijk anders zijn. Dit betekent dat in de praktijk dierenwelzijn niet eenvoudig in algemene termen is vast te stellen, maar ook afhangt van contexten en relaties. Dus, wat een koe is, en hoe we ons het beste tot haar kunnen verhouden, is de uitkomst van voortgaande processen van maatschappelijk-technologische verandering.

'Robotboeren' veranderden ook. Niet langer hebben zij een routinematige omgang met alle koeien maar gaan ze over tot management op basis van uitzonderingen. Terwijl automatisering veelal wordt geassocieerd met vervreemding en een afname van ambachtelijkheid, kwamen boeren er juist achter dat ze een rustigere en vriendelijkere verhouding tot hun koeien ontwikkelden, aangezien deze de boer niet langer in verband brachten met gemolken en opgedreven worden. Met de robot kwam een ideaal op om 'de kudde niet te verstoren', wat betekent dat de boer meer aan processen in de kudde overlaat, terwijl de robot deze verandert. Daarmee verschuift de verantwoordelijkheid van de boer van het zorgen voor dieren naar dieren in staat stellen goed voor zichzelf te zorgen. Net als bij de casus in het vorige hoofdstuk omvat ook hier de dynamiek van ethische beoordelen veranderingen in de termen van het debat en de subjectiviteiten van, in dit geval, zowel boeren als koeien. Tegelijkertijd, als daadwerkelijke co-evolutie, zien we hoe deze nieuwe rollen en ethische normen ook weer de materiële organisatie van de robot in de stal beïnvloeden. Boeren nemen in veel gevallen afstand van eerdere opstellingen met 'gedwongen koeverkeer', waarbij de koeien verplicht door de robot moesten om hun voer te bereiken, om in plaats daarvan gelegenheid te bieden voor hen om (in zekere zin) meer vrijelijk hun gedrag te bepalen.

Met het omarmen van co-evolutie en het loslaten van vaste normen en meer formele vormen van morele kritiek ontstaat er een gevaar dat we ethisch terrein verliezen en kritische termen zoals 'natuurlijk', 'autonomie', 'vrijheid', 'exploitatie' en 'vervreemding' moeten opgeven. Enerzijds hebben deze termen in een technologische cultuur inderdaad geen vaste betekenis. Maar anderzijds stelt dit hoofdstuk dat deze termen, juist doordat ze worden betwist, nog steeds belangrijk zijn bij het omgaan met veranderende ervaring en morele betrokkenheid van boeren.

Hoofdstuk 5 gebruikt ook het voorbeeld van de melkrobot. Maar in plaats van slechts de beschrijving van co-evolutie uit het vorige hoofdstuk met nadere details uit te werken, is dit hoofdstuk geschreven in een meer argumentatieve stijl: als een soort manifest voor

de waardering van de actieve rol van dieren als politieke wezens met wie we 'dierendeliberatie' aangaan.

Er is in toenemende mate aandacht voor niet alleen de morele maar ook de politieke status van dieren. Dit levert de uitdaging op hoe dierenpolitiek te begrijpen, zowel in theorie als in de praktijk. Tegenover de gangbare aanname dat dieren 'geen stem hebben' en dat op een of andere manier vertegenwoordigd worden door mensen het enige is waar ze op kunnen hopen, ontwikkelt dit hoofdstuk een begrip van deliberatieve democratie waarin bestaande vormen van politieke communicatie over de soortgrenzen heen worden erkend. Het hoofdstuk introduceert het idee van ontwerpen als politiek en ontwerpen met dieren als deliberatief door middel van een eenvoudige huiselijke technologie: het kattenluikje. Dit alledaagse voorbeeld laat al zien hoe mensen en huiskatten onderhandelen en hun onderlinge verhouding uittesten. Wanneer ontwerpen van technologie wordt begrepen als een proces van knutselen met onze ideeën van het goede leven en passende mens-dier relaties, dan kan het ontwerpen voor en met dieren worden gewaardeerd als een leerproces tussen de soorten dat politieke status zou kunnen worden verleend.

Het hoofdstuk volgt een groep boeren en techneuten die samen met een kleine kudde melkkoeien gedurende een paar jaar experimenteerden met een mobiele melkrobot om de koeien buiten in de wei te melken. Weer leidde een schijnbaar eenvoudige aanpassing van een technologie tot een complexe dynamiek. Technische uitdagingen om het apparaat aan de praat te krijgen en de koeien productief te laten zijn waren verweven met wat in ethische theorievorming zou worden gezien als conceptuele vragen over het belang en de betekenis van natuurlijkheid, vrijheid, vrijwilligheid, en de verantwoordelijkheid van boeren. Deze vragen werden niet puur en alleen opgevat op een discursief, talig niveau. Er werd met verschillende praktische betekenissen van deze centrale noties geëxperimenteerd door nieuwe materiële arrangementen te creëren en de daaropvolgende interacties te bekijken. Voortdurend was het karakter van de koe onderwerp van interpretatie door de boer: om te bepalen of ze genetisch 'lui' zijn of niet het juiste voer krijgen, of ze te eigenwijs of niet intelligent genoeg zijn om de robot te bezoeken, of dat ze het niet prettig vinden om naar de robot gedirigeerd te worden en liever zelf beslissen wanneer ze er in gaan. Het proces van knutselen of *bricolage* liet zien hoe in situaties van technologische innovatie een responsieve verhouding ontstaat van wederzijds leren, waarin de subjectiviteiten van zowel boeren als dieren voortdurend opnieuw worden gedefinieerd en afgebakend.

De theorie van deliberatieve democratie benadrukt dat politiek niet moet worden beschouwd als een samenkomen van individuen met gegeven voorkeuren, maar als een proces waarin zij ontstaan. Hedendaagse denkers over deliberatie geven aan dat het een politieke stijl is die vertrekt vanuit alledaagse ervaringen en dat deliberatieve vormen van interactie op onverwachte plekken kunnen worden aangetroffen. De erkenning van de actieve en betekenisvolle rol van dieren en de waardering van het deliberatieve karakter van deze alledaagse, deels materiële en niet-discursieve processen kan bijdragen aan het serieus nemen van dieren in publieke debatten over hoe tenminste een aantal van tot nu toe genegeerde leden van onze politieke gemeenschap moeten worden gehouden, gemanaged, behouden, of bevrijd. Door oog te hebben voor de onderlinge afhankelijkheid, wederkerigheid en inherente meerduidigheid van onze omgang met dieren, en die van hen met ons, kunnen we ons aangespoord voelen tot een onderzoekende, experimentele en voortdurende politiek van alledaagse ontmoetingen met dieren.

In een **intermezzo** bevindt de auteur van het proefschrift zich weer aan tafel met een groep boeren. Een vergelijkbare situatie zoals die werd geschetst in het voorwoord, maar dit keer op een melkveeboerderij in een discussie over de mobiele melkrobot. In plaats van bij te dragen door de gebruikte concepten te definiëren en te proberen de boeren zich specifieke termen eigen te laten maken om het ethische karakter van wat ze aan het doen zijn te begrijpen, begon hij te experimenteren met een andere, meer evocatieve, visuele benadering.

In **hoofdstuk 6** keren we terug naar de varkenshouderij en naar de Europese regel rond hokverrijking die beoogt de verveling van varkens te verminderen en te voorkomen dat zij in elkaars staarten bijten. Wanneer spectaculaire technologische voorstellen nieuwe morele werelden kunnen openen, en wanneer het implementeren van technologie kan leiden tot deliberatie met dieren op de boerderij, dan is het ontwerpen van een aansprekende veehouderijtechnologie een veelbelovende manier om deze situatie zowel te bestuderen als er in te interveniëren. Door de eis om varkens iets te spelen te geven radicaal door te trekken wordt een project geschetst om computerspellen te maken waarmee ze kunnen worden vermaakt. Dit op zichzelf zou een manier kunnen zijn om aandacht te vragen voor zowel het welzijn als de geestelijke vermogens van varkens. Maar het is nog interessanter om te proberen in te grijpen in de verhouding tussen mens en dier door een spel te maken waarmee de varkens met mensen zouden kunnen spelen.

Dit project verbindt debatten over het gebruik van dieren en dierenwelzijn met de gedachte van John Berger over 'het verdwijnen van het dier' in de moderne cultuur, waarin "nog slechts huisdieren en karkassen overblijven." Spelen met varkens biedt daarbij een manier om actief in de weer te gaan met recente discussies over alternatieve vormen van wetenschappelijk onderzoek naar dierlijke cognitie en gedrag, zoals onder de noemer 'meersoortige etnografie'.

Dit hoofdstuk beschrijft een eerste spelidee, waarvoor de ontwerpers een (deels trucage) video hebben gemaakt: *Pig Chase* verbindt mensen en varkens door hen in staat te stellen samen een lichtgevende stip te bewegen over een scherm in de varkensstal en op een iPad. Het evocatieve karakter van deze interventie in het publieke debat hield in dat we de mogelijke betekenissen ervan en de potentie om mens-varken verhoudingen te doordenken niet volledig beheersten of zelfs maar konden voorzien. Daarom wordt de verscheidenheid aan reacties die het project al heeft weten te genereren gebruikt om de mogelijke implicaties te schetsen van 'met je eten spelen', zoals het project in de populaire media werd genoemd.

Hoofdstuk 7 verkent de mate waarin het ontwerpen aan spelen met varkens kan werken als een subversieve ingreep ten opzichte van bestaande dierpraktijken zoals de veehouderij en het houden van huisdieren. Vragen die in het ontwerpproces opkomen betreffen het ideaal van natuurlijkheid, de hiërarchische ordening van soorten op basis van cognitieve vermogens, mogelijke symmetrie in mens-dier verhoudingen, en het al dan niet open karakter van spelen. Ideeën ten aanzien van deze thema's waren deels aan het begin van het ontwerpproces ontwikkeld als ontwerpcriteria, om te zorgen dat dieren daarin en in het uiteindelijke spelontwerp een betekenisvolle en actieve rol hadden. Hier worden deze thema's verder uitgewerkt, op basis van literatuur op het gebied van mens-dier relaties en discussies over nieuwe vormen van onderzoek naar diergedrag die een meer actieve menselijke aanwezigheid daarin toestaan of daar zelfs toe oproepen. Maar deze thema's zijn ook de belangrijkste kwesties waar we in het ontwerpproces mee worstelden. Uiteindelijk komt het hierbij neer op de vraag wat het betekent om te spelen en het eigenaardige karakter van spel tussen verschillende (dier)soorten.

Door specifieke ontwerpkeuzes voor het eerste prototype van het spel, dat we momenteel aan het testen zijn, uitgebreid te bespreken, toont het hoofdstuk de wijze waarop het ontwerpproces kan werken als een vorm van 'meersoortige filosofie': als

een zowel materiële als discursieve vorm van onderzoek naar onderling verweven ethische, filosofische en wetenschappelijke vragen over hoe we ons kunnen (en misschien moeten) verhouden tot varkens.

Het volgende **hoofdstuk, 8**, speculeert verder over de morele aard van dit type gemedieerde interventie, in het licht van historische processen van co-evoluerende moraliteiten en genres. Bij het doordenken van het ontwerpproces en de mogelijke effecten die de ervaring van onderling spelen op menselijke en niet-menselijke spelers zou kunnen hebben, bleken vragen over de (morele) subjectiviteit van mensen diepgaand verweven te zijn met de vraag hoe (dierlijk) denkvermogen te begrijpen. Dit hoofdstuk verkent vervolgens hoe de co-evolutie van moraliteit met bepaalde culturele genres, zoals romans, film of computerspellen, invloed zou kunnen hebben op alternatieve vormen van omgaan met dieren. Een reeks van debatten over mens-dier relaties worden in verband gebracht met tegenstellingen zoals die tussen empathie en sympathie, en tussen liberale idealen van individualisering versus de post-humanistische nadruk op het primair relationele karakter van (al dan niet menselijke) individuen. Uiteindelijk wordt beargumenteerd dat de spanning gegenereerd door deze tegenstellingen, die centraal bleken in het voorstellen van de verhouding tussen (premoderne) boeren en hun dieren, neer te komen op ons vermogen om onderscheid te maken tussen aanraken en aangeraakt worden. Het hoofdstuk eindigt met het serieus nemen van de beschuldiging van een aantal (online) commentatoren dat het project uiterst problematisch, of zelfs walgelijk en pervers is. Daarmee richten we ons (weer) op de vraag naar de mogelijkheid van een gemeenschap van meer dan alleen mensen in onze technologische (veehouderij) cultuur.

De conclusie van die proefschrift is dat de beste manier om aan landbouweethiek te doen is om naar boerderijen te gaan, met boeren te praten, samen met dieren te leven en nieuwe technologieën te ontwikkelen. Maar wanneer praktisch knutselen het ideaal is, is het dan niet vreemd om hier zoveel moeilijke woorden aan vuil te maken? **Hoofdstuk 9** spruit voort uit een gevoel van verwondering over het zelfondermijnende karakter van het schrijven van een ellenlang academisch traktaat dat beoogt te beargumenteren dat ethiek eigenlijk plaatsvindt in materiële praktijken op de boerderij. Dit is de paradox van het schrijven over pragmatische ethiek: pragmatisch gezien verandert al dat geschrijf en ge lees over gesitueerde ervaringen, belichaamde praktijken en het belang van met beide voeten in de modder staan ons slechts in breinen op stokjes. De onvermijdelijke

eigenlijke boodschap van een proefschrift lijkt te zijn dat ware kennis en ethische argumenten zijn geschreven in academisch proza.

Na het overdenken van diverse impliciete effecten van schrijven en taal als de veelal aangenomen manier van omgaan met ethische kwesties, stelt dit proefschrift dat het volledig afzien van woorden te ver zou gaan. Taal en schrijfsels kunnen inspireren tot creatieve materiële praktijken en deze ook weer bekritisieren, in een heen-en-weer tussen lezen en knutselen. Net zoals theoretische discussies het maken van Pig Chase informeerden en andersom; zoang maar duidelijk is dat het benutten van het alfabet geen neutrale keuze is bij het doen aan ethiek, en dat materiële praktijken ook serieus worden genomen als een vorm van ethische reflectie.

Dit hoofdstuk eindigt met de gedachte dat het doel van het proefschrift het best kan worden opgevat als laten zien, niet vertellen. De minst zelfondermijnende manier om het af te sluiten is dan door te laten zien hoe het 'spelen met varkens' ontwerpproject zelf, als een gesitueerde en materiële onderneming, kan worden beschouwd als de eigenlijke conclusie van dit theoretische en praktische onderzoek.

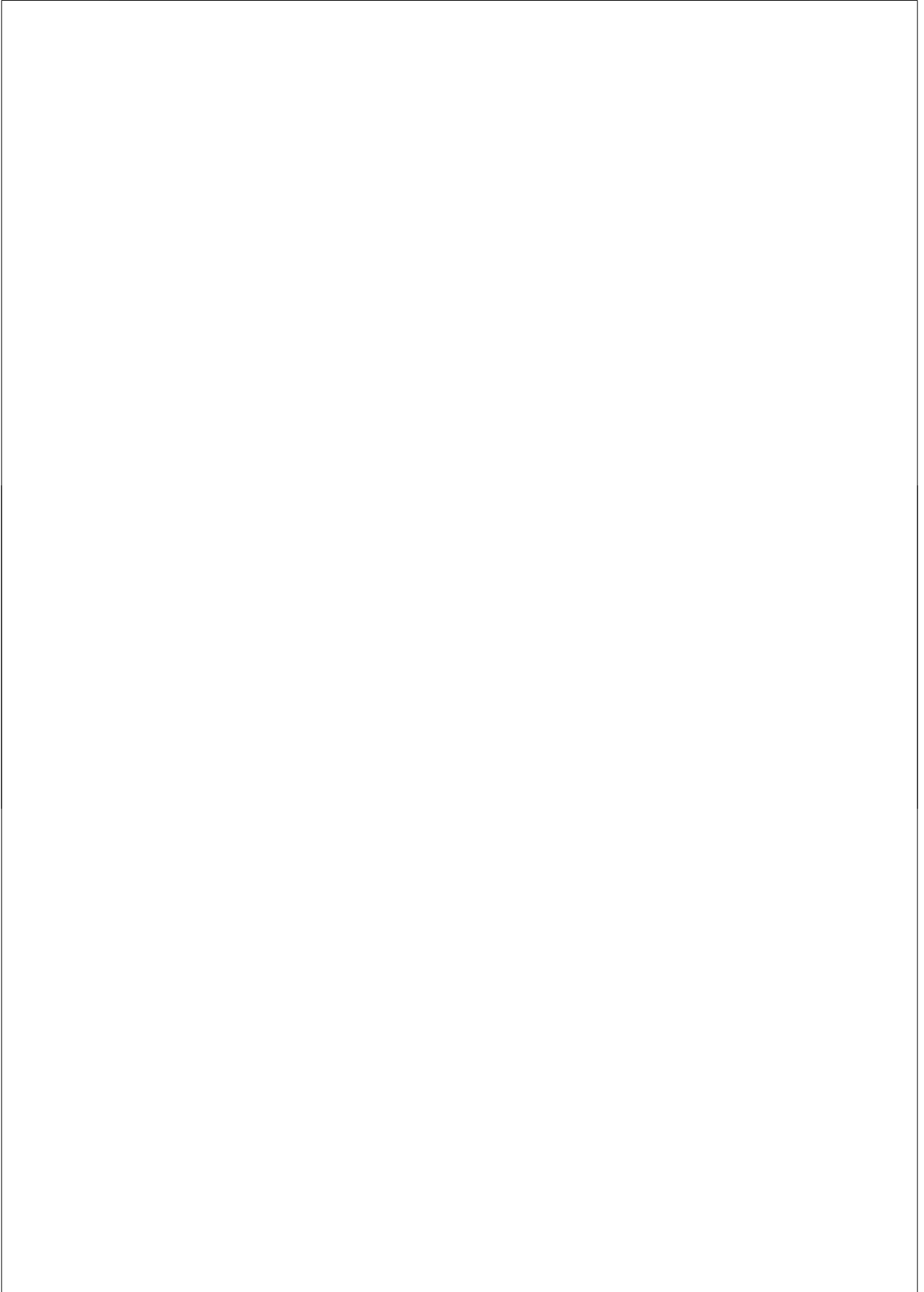
Hoofdstuk 10 poogt inderdaad verre te blijven van het maken van algemene claims. Ook biedt het geen set instrumenten voor beleidsmakers. In plaats daarvan kijkt dit hoofdstuk terug op hoe de verschillende voorgaande hoofdstukken het varkensspel ontwerpproject informeerden, en hoe dat op een handige manier ons zou kunnen helpen om processen van co-evolutie tussen technologie en ethiek op de boerderij te begrijpen. De hoofdstukken van het proefschrift kunnen worden beschouwd als pogingen om enthousiasme op te wekken om deel te nemen aan deliberatie, die op steeds ruimere manier wordt begrepen: onder boeren en hun belichaamde praktijken, in radicale technologische ontwerpen, door te knutselen aan agro-technologie, met dieren als actieve deelnemers hieraan, en creatief ontwerpen als een manier om ons actief tot dit proces te verhouden. Naast de besproken suggestieve genres, die oproepen tot actie rond milieu- en dierenkwesties, is mens-dier computerspelontwerp verkend als een nieuwe manier om interessante situaties voor morele ervaring, reflectie en debat te creëren. In het spelproject wordt een ander moreel subject uitgenodigd en vormgegeven, voorbij burger en consument. Een nieuw genre ontstaat om ons met ethiek bezig te houden, door ons te betrekken in affectieve relaties.

Het voorgestelde ontwerp vertrekt niet vanuit de gedachte dat het moreel neutraal zou zijn. In plaats daarvan beoogt het de ervaring van ambivalentie ten opzichte van dierhouderij te intensiveren, door industriële voedselproductie te combineren met idealen van betekenisvolle mens-dier interactie zoals bij het hedendaagse huisdier. In het ontwerpproject wordt het proces van maatschappelijk-technische co-evolutie ingezet als interventie. Daarbij is het ook een vorm van onderzoek naar de manier waarop technologische verandering aanleiding vormt voor debat, nieuwe manieren van kijken naar een kwestie levert, en invloed heeft op wat het betekent een moreel subject te zijn ten aanzien van voedselproductie met en van dieren. In plaats van het aanbieden van een puur technische oplossing, of het geloof dat we volledig bepaald worden door de technologie, houdt dit type ontwerpen in dat we ons actief verhouden tot co-evoluerende normen, inclusief het verschuiven van de betekenissen van centrale noties. Wat het betekent om te spelen en wat de morele betekenis van gemedieerd spelen met andere soorten zou kunnen zijn kan worden bediscussieerd in het licht van dit project.

We hebben onze design interventie expliciet opgezet als een experiment met nieuwe mens-dier verhoudingen, inclusief het ontwikkelen van nieuwe gevoeligheden en het vergroten van onze responsiviteit ten opzichte van diergedrag. Dit maakte het vanzelfsprekend om dieren een serieuze rol als medeontwerpers te geven. Gedurende het proces leerden we steeds meer te reageren op hun gedrag en ontwikkelden we verschillende manieren om de betekenis ervan te interpreteren. Aangezien we interactief bezig waren ons het leven op de boerderij opnieuw te verbeelden en dat te verbinden met een breder publiek, stelden we ons het spelproject voor als een platform om te delibereren met dieren.

Het is niet altijd eenvoudig om ons lokaal bezig te houden met kwesties die niet volledig zijn te begrijpen vanuit gesigneerde ervaring. Er lijkt geen standaardoplossing te zijn voor dit type probleem. Om ethiek te bedrijven op co-evolutionaire wijze kunnen we ons onderdompelen in inspirerende voorbeelden van kunstenaars en ontwerpers. Om zo onze zinnen te openen voor vormen van lijden en ons inbeeldingsvermogen te vergroten voor manieren waarop lokale omstandigheden altijd zijn verbonden aan wereldwijde kwesties – kwesties die zelf altijd ook lokaal zijn en niet alleen van op afstand zijn op te lossen.

In het **nawoord** keren we terug bij de varkenshouder uit het voorwoord, die in de tussentijd haar boerderij radicaal heeft veranderd.



Acknowledgments

Far from being the solitary affair that writing a PhD thesis is often said to be, this one has led me to meet an amazing array of people who in various ways and stages have been kind enough to help me and spur me on. Listing everyone who has been important in realizing this thesis is a hopeless task. Nevertheless I think it is not only a friendly gesture to try and give due credits. Also this attempt may offer some insight into how I went about studying ethics, on the farm and by design. Thus besides acknowledgments, this is also a kind of methods section, revealing the social nature of 'empirical philosophy in action'. More or less 'in order of appearance', these people I would like to thank:

Before coming to Wageningen, Ibo van de Poel at the TU Delft had helped me on my first steps of researching ethics in the field. Whereas at the UvA the late Wouter Achterberg had raised an interest in environmental philosophy and Gerard de Vries introduced me to STS and the work of Latour. Him I also need to thank for forwarding me the vacancy that led to this thesis, at a moment when I had no idea I would be suitable for attempting an academic career.

My main indebtedness in making this thesis is of course to my promotor Michiel Korthals and co-promotor Volkert Beekman. First of all for not only setting up the 'Ethical Room for Manoeuvre in Livestock Farming' project, but also for believing that I was the appropriate candidate to execute it. This appeared to be an unwavering trust even when I kept on moving in ever more strange directions without churning out the promised chapters. I don't remember a hint of panic with them when I drifted into extensively studying the philosophy of biofuels, or the abolition of slavery as a system innovation process. Michiel, thank you for providing a lot of room for manoeuvre and for showing me how things may become truly interesting when pushed just a little further. Volkert, even though you weren't panicking, you were probably right when three months into the project you told me I had started to run behind schedule. When

writing is deleting, which I believe in my case is extremely so, then Volkert has written large parts of this thesis. I cannot thank you enough for mass murdering my darlings and with Michiel weeding out numerous (though not quite all) pointless digressions.

The project was kindly funded by NWO as part of the 'Ethics, Research and Policy' programme, which to my luck meant that also three very friendly and interesting animal welfare specialists of Wageningen UR 'Livestock Research' were actively involved. Hans Spoolder, thank you for your ideas on developments in animal welfare research. Leonie Heutinck, thank you for putting me onto the milking robot, for doing some interviews together and for insights into dairy farming. And Marc Bracke, for involving me in your work on pig pen enrichment and taking me along to the farm meeting described in the prologue, which eventually proved to be the start of a central part of the thesis. I still remember fondly your enthusiasm when I first told you I met up with designers who may be able to make something for pigs to play with us.

Besides these colleagues who were formally involved, I enjoyed the added bonus of a vibrant Applied Philosophy (by now rebranded as just Philosophy) chair group. My super kind roommates Liesbeth Schipper and Silvia Blok always brightened up the day and were good sparring partners at hand on animal and nature ethics. The others who were ahead on the PhD track and with whom we had a good time figuring out what pragmatist ethics might mean in various practices: from Rixt Komduur's nutri-genomics, to Bram de Jonge's plant knowledge benefit sharing, from Gilbert Leistra's legitimations of nature policies, to Tassos Michalopoulos' supermarket tomatoes and biofuels and to Mohammad Balali's traditional Iranian irrigation systems. With Vincent Pompe I had heated discussions on what it is like to have ethical room for manoeuvre, and with Cristian Timmermann it was fun lamenting the sorrows of academia.

The permanent members of the group have been very central in developing this thesis: Leon Peijnenburg with helpful scepticism regarding buzzwords and vague notions such as 'practices' and 'participation' and for discussions on slavery and its abolition. Henk van den Belt who was equally sceptic towards the theoretical hypes I liked to embrace but nevertheless open to encourage my 'wild ideas', while trying to provide some more serious backing to my leapfrogging across theories and philosophers, and always willing to discuss Heidegger over lunch. Jozef Keulartz, thanks for as a true pragmatist downplaying any theory, for promoting Rachel Carson, and for discussions on zoo and circus animal welfare and enrichment debates which he was working on when I started

to think of playing with pigs. The 'special professors': Henk Jochemsen with a shared interest in the positions of farmers. The wonderful Bert Blans, who sadly passed away just after retiring. And most of all Cor van der Weele, for convincing me of the fascinating character of in vitro meat on which we are still intensively collaborating, for promoting Dewey, and for showing the value of writing clearly and sincerely about complicated matters.

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But this is running ahead of things. Various people outside of my formal institutional base have been crucial from the start. In an early stage I received a very warm welcome, especially by Karel de Greef and Bram Bos, to the both practical and theoretical field of livestock innovation projects as developed by the Wageningen UR Livestock Research system innovation group. Your projects are inspiring in many ways and made me want to initiate a little innovation project myself.

As a complete farming ignoramus, the practical training course at the now defunct PTC+ Oenkerk, on occasion organized by the 'Boerengroep' of Wageningen University was a wonderful way to get immersed in dairy farming life. My thanks goes out to all farmer-lecturers and the other participants, but most of all to Lars Keizerwaard and Douwe Kappers. Not only for your enthusiasm to organize this, but your plans of starting your own dairy farm lent a serious touch to a week that was as fascinating as it was fun. Lars, the idea that I got my first (and last) cheese making lesson with someone who now on his farm makes the best goat cheese of the Netherlands is humbling.

Perhaps lack of space, but also research ethics and the norm of anonymity prevent me from thanking all the farmers (around 50 of them) who were kind and open enough to talk to or even welcome in their home this strange character of an 'agricultural

philosopher'. But obviously these visits were central for realizing this thesis. I hope (but in most cases doubt) that it actually somehow may have been worth your trouble. A few farmers I can thank because they have been explicitly involved in our game design project: Marijke Nooijen for her unwavering enthusiasm (at vair.nl you can feed her pigs an apple); and Dick van der Vegt for his willingness to have a bunch of designers for days amidst your pigs and to play with them through our prototype. In general when farmers are willing to talk professionally this mostly means a very personal welcome in a home, whereby personal and professional identities and concerns are indistinguishable. This experience was the start of chapter 2.

The weeklong field trips with vocational and academic farming students set up by Wanka Lelieveld were fascinating not only for having innovative farmers explain their inspiring practices on their farms, but also to discuss these afterwards with sceptical young farmers. Thanks also to the others involved in these trips: Florian Kuyper, Barbara Tielemans, Sanne van den Dungen, Harmen Riphagen, the historian of intensive pig farming Mathijs Witte, and fellow agro-STS-er Hanneke Miedema, aspiring dairy farmer Maarten Kea, and agro-technologist Peter Groot Koerkamp. I learned a lot from students of HAS Den Bosch, CAH Dronten, Jan Harm Borger, students of AOC Leeuwarden, Durk Oosterhof, Gea Zandvliet, and various students of Wageningen University.

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and the kind editor of the Journal of Agricultural and Environmental Ethics, Richard Haynes.

I presented a very early version of chapter 3 at the 2008 Summerschool of the Netherlands Graduate Research School of Science, Technology and Modern Culture (WTMC), organized by Sally Wyatt and Willem Halffman, and featuring Andrew Feenberg and Lucy Suchman. They together with the other participants helped me to turn a mere idea into an argument. Interesting conversations started there with Anne-Charlotte Hoes, Sarah Slaghuis, en Jenny Boulboullé. On *varkensflats*, *agroparks* and the like, I enjoyed a small debate with Peter Smeets set up by De Boerengroep. Marjan Slob and Jan de Wilt later invited me for a fascinating discussion on the unease over the issue of scale in agriculture. Tsjalling Swierstra organized a session at the 2009 Society for the Philosophy of Technology conference which was valuable for feedback. The 2011 symposium on in vitro meat at the Centre for Society and Genomics, Radboud University Nijmegen with Neil Stephens provided a friendly setting to discuss ideas, as did the recent 'in vitro flesh' meeting organized by Jan Deckers in rothbury, UK. (I think I finally manage to quote you rightly in this thesis, Neil.) A very big thanks also to Michael Lynch as the editor of Social Studies of Science for extensive helpful comments, together with those of three anonymous reviewers. Mark Coeckelbergh had some incisive comments on the final version. More cultured meat experiences sprung from people at V2 Rotterdam organizing the 'Art Meat Flesh' In Vitro Meat Live Cooking Battle: Michel van Dartel, Oron Catts, Cat Kramer and Zack Denfeld of the Center for Genomic Gastronomy, and Bernard Roelen as the adversary. Koert van Mensvoort and Hendrik Jan Grievink for having me at your Next Nature in vitro meat design workshop. Earlier I had enjoyed discussing some ideas on the topic with Steven Dorresteyn and Daisy van der Schaft at the Enschede Science Cafe. The Bergen/Trondheim crowd helped me connect ideas of this paper with the rest of the thesis: Roger Strand, Alan Alvarez, Lars Ursin, Asle Kiran, Sophia Efstathiou. Rune Nydal, Peter Danielsson, Desiree Foerster, and others. They also listened to an even more meandering version of chapter 9.

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Agriculture and Human Values, Harvey James. Along the way (farm) animal geographers Lewis Holloway and Chris Bear turned our shared interest in farmers, cows and robots into an exciting scholarly conversation. Also it was interesting to be interviewed on robots and creative design in connection to the Dutch Design Week by Sebastiaan Aalst of Foodcabinet.

Chapter 5 has been severely cut down and sharpened after an intense week of discussions at the Antwerp joint sessions of the European Consortium for Political Research. And further so after the firm editing by the organizers Marcel Wissenburg and David Schlossberg for their forthcoming Political Animals and Animal Politics edited volume. The chapter was seriously grilled at the practical philosophy colloquium at my temporary home the Philosophy Department / Ethics Institute of Utrecht University. Thank you Bernice Bovenkerk and Frederike Kaldewaij for offering me the stimulating experience of what it's like to be torn apart by a pack of hounds.¹³² I very much enjoyed ongoing conversations with truly everyone at Utrecht, but to name a few who were especially relevant: Jan Vorstenbosch, Mariette van den Hoven, Ineke Bolt, Robert Heeger Franck Meijboom, Rob van Gerwen, Frans Stafleu, Marcel Verweij, Joel Anderson, Kirsten Pols, Frans Brom and Caroline Harnacke. Paragraph 1.4 grew from my wonder over ethics as a theoretical and empirical field, on which I enjoyed a conversation on a train with Niels Nijssingh.

The intermezzo/cover image I tested not only with farmers but also at the Hunnie polder arts event in the 'Green Heart' of the Netherlands, set up by artists Sophie Krier and Henriette Waal. And I enjoyed the conversation at the graduation seminar of the Willem de Kooning Rotterdam art school, where I was invited by Kevin Sträter.

Moving to chapters 6 to 8 I truly get into trouble thanking all those relevant, here the people actively involved slowly exploded. Marc Bracke was important in the early stage of the project when we were thinking through what pigs might be interested in and what gaming with them may mean to farmers. It was at times exhausting but overall very exciting to start what turned out to be an ongoing collaboration with the Utrecht School of the Arts (HKU) team. Marinka Copier, wonderful that you were willing to embark on this adventure with me and to find out together in what roles we could

¹³² It took friendly conversations with them afterwards, as well as with Kersty Hobson and Eva Meijer to help me regain some theoretical confidence to persevere with seeing animals as deliberating.

collaborate. Designers Kars Alfrink, Irene van Peer and Hein Lagerweij, thank you very much for accepting me in your midst, I truly learned a lot from your enviable hands-on creativity and our joint public talks. I look forward to us giving our vision another go. Also consecutive groups of HKU students came up with interesting ideas on forms and meanings of interspecies play.

It was nice to also infuse the fish welfare project with the aim of creating meaningful interaction, together with the HKU designers including Rob Zimmermann. This led to very enjoyable conversations on fish minds, biology and ethics with Gert Flik, Ruud van den Bos, Hans van de Vis, Bernice Bovenkerk, Franck Meijboom, Remy Manuel en Jeroen Boerrigter. Also others in the NWO 'Value of Animal Welfare' program came up with interesting ideas and comments, Marianne Benard, Marjolein Kops and Irene Camerlink.

In the mean time I had moved to King's College London for a year, which turned out to be very rewarding. Thank you Jamie Lorimer for what has become an ongoing intensive collaboration and for helping me discover various more-than-human geographies. Krithika Srinivasan has also been a major inspiration for thinking through animals. Others at the London animal studies reading group provided fresh perspectives, such as Beth Greenhough, Kim Stallwood and Alasdair Cochrane. As did the friends from the post doc room: Sebastien Nobert, the Emma's Jackson, Hinton and Street and the rest of the wonderful idiosyncratic bunch that geography departments tend to gather together.

Besides those directly involved in interspecies play projects, there has been a large array of people with whom our Pig Chase conversation piece generated interesting ideas. Most notably Ellen van Weeghel, Arianna Ferrari, Henny van Rij of the ministry EZ, the Vienna crowd of Herwig Grimm, Gyula Gajdon and Judith Benz-Schwarzburg with whom we organized a pig game design workshop at Eursafe in Tübingen, and those present there. Giovanni Aloï and Tom Tyler, who heard me present the pig game story once too often but nevertheless invited a piece for the special issue of *Antennae* on animals in video games. Game designer Hanna Wirman of Hong Kong polytechnic for inspiring conversations on her project to create Orang Utan games in Indonesia. Others who connected the project in fresh ways to various animal debates were Anat Pick, Hanneke Nijland, Timothy Pachirat, Jonathan Balcombe, Paul Thompson, Ike Kamphof, Godelieve Kranendonk, Hans Hopster, Marijke de Jong of the Dierenbescherming, Geert Wilms at Landbouw Innovatie Brabant, Tineke Schuurmans and her 'Meating' pig oriented art

events, Sabrina Brando with her ethics course for animal trainers, Tamar Stelling of NRC Handelsblad, Jan Groeneveld and Jan Hartholt of Kasteel Groeneveld. Thanks also Ine Gevers and other curators of 'How art saves the world' at the Gemeentemuseum/GEM Den Haag for exhibiting our concept video.

For integrating the various lines in the thesis it was helpful to collaborate with Jeroen Kramer and his students at the Rietveld DesignLAB in combination with my Wageningen students who were trying to make sense of arts and design. Also helpful was a conversation with Taco Schmidt on design thinking, and with Michiel de Krom on his sociological findings on animal welfare in pig farming practice.

There are others associated with this odd communal place that is Wageningen University I need to thank: all the people at (what is now) WASS graduate school, and especially its committed leadership, (until recently) Eveline Vaane. It was good to know that you were waiting for me to finish. The fellow members of the PhD council Enna Vlajic, Jolanda Jansen, Robert Demeter, Nidhi Gupta, Evelien van de Veer and Els Bilman. Gert Jan Becx-Komduur and the rest of the board of the RUW foundation which still keeps on organizing surprising and interesting events.

Over the past few months I was lucky enough to have some in depth conversations and receive incisive critiques of the entire thesis. At my new lively Wageningen home base of cultural geography, where a bunch of you had some tough and exciting comments, Hamzah Muzaini, Lauren Wagner, Iulian Barba Lata, Martijn Duineveld, Meghann Ormond, Maarten Jacobs, Arjaan Pellis, and Henk de Haan, to unjustly name but a few of those who came up with critiques and ideas. Especially Claudio Minca I need to thank for being willing to take this endless PhD on board and for giving me the final push I needed to get rid of it. Esther Turnhout, Bas Arts and Susan Boonman-Bersson, thank you for also taking me on board of FNP and involving me in your projects and teaching.

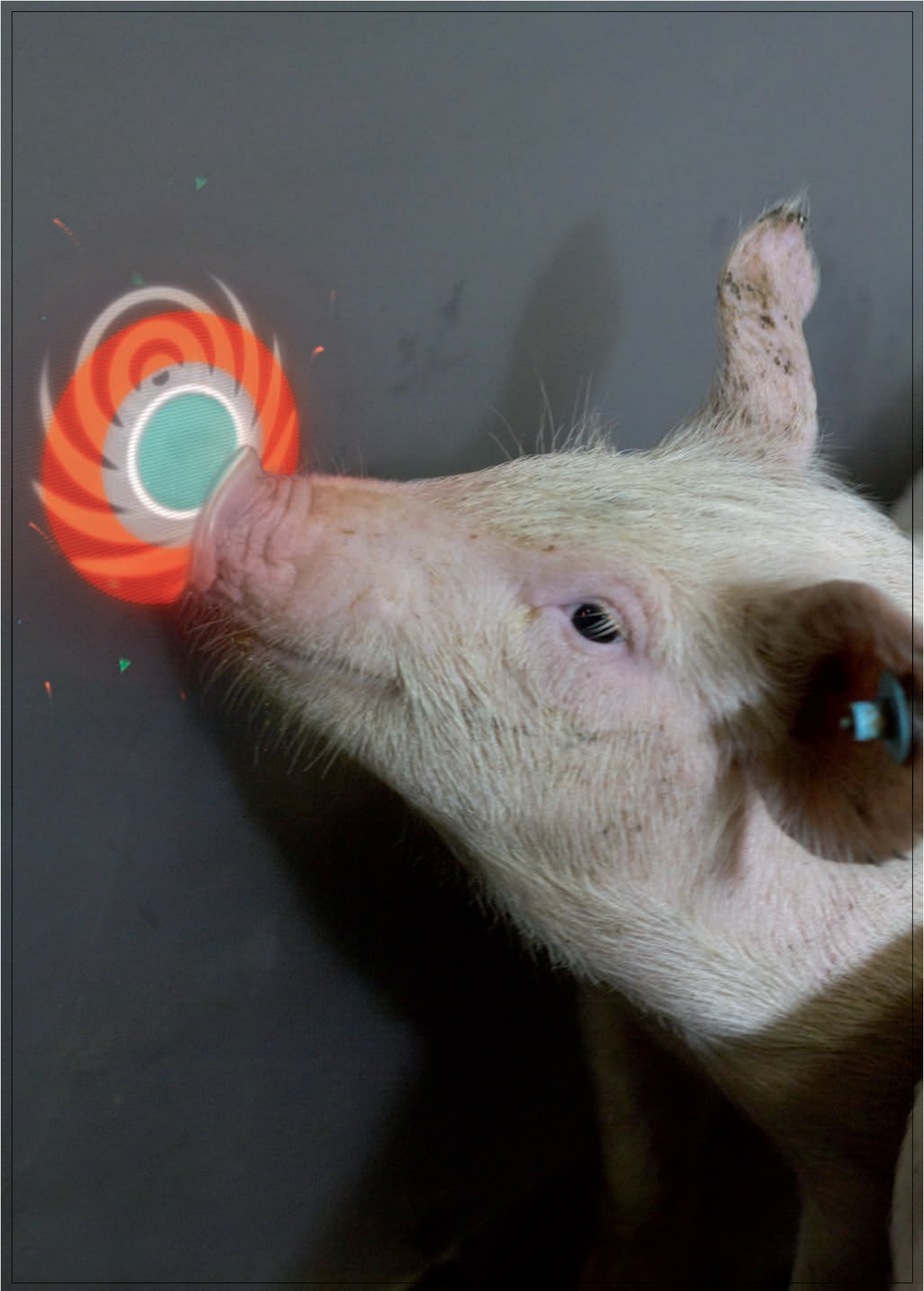
The group of Martin Drenthen in Nijmegen, with Glenn Deliege, Andrea Gammon and Mateusz Tokarski was very kind to have me for a 3.5 hour intense but friendly discussion of the thesis. I enjoyed an extensive discussion with fellow experiential philosopher Mihnea Tanasescu with an interest in animals and animal politics. And pig boredom expert Francoise Wemelsfelder was kind enough to have me ask her about chapter 8 while scaling a hill in Northern England, responding in a way that took me all the way down to ponder it over.

Then I need to thank Bev Sykes for proofreading an earlier version of chapter 4, chapter 10 and the English summary; as well as Irene Pekaar and Gerben Kruk for helping out with image post-production. Martijn Coppoolse and Jasper Jorritsma, great that you are willing to stand guard on stage during the defence. And thank you very much, my committee members Annemarie Mol, Cees Leeuwis, Henry Buller, and Tsjalling Swierstra, for not only coming to Wageningen, but especially for your willingness to plough through all those pages of meandering ideas.

Of course not all who were important for realizing this thesis have been mentioned in order of their appearance. So the remainder is in reverse:

Renate, in each thesis acknowledgement there is someone who cannot be thanked enough. Thank you nevertheless, for revealing that prolonged co-evolution can be an enjoyable process wherever it leads. With you combining the roles of being my biggest sceptic and most enduring support, this thesis is very much the product of our shared life. And you were probably right in vetoing my initial research plan of trying to become a dairy or pig farmer as a participatory method.

Also I'd like to thank my wise sister Eugenie who always seemed confident I was making sensible choices, which since she is a professional career advisor at times seemed quite puzzling to me. Finally there are two people for whom ending this thesis is a rite of passage as well. I guess (or hereby propose) finishing my formal education absolves you from any further parental duties and worries. Peter and Mary, I dedicate this thesis to you, for showing, not telling, me how to read and how to listen.



Biography

Clemens Driessen was born in Amsterdam on a cold and stormy winter night in 1976. His parents soon after moved him and his older sister to the coastal suburban town of Castricum. There, little Clemens spent his free time reading cowboy stories, climbing trees, playing field hockey and doing some windsurfing. After graduating in the Gymnasium class of the Bonhoeffer College he went to Delft to study Systems Engineering and Policy Analysis at the University of Technology. After a year, he started to combine this with Philosophy at the University of Amsterdam. Since he advanced in both rather smoothly but unspectacularly, he was in danger of finishing within a year of five without a sense of what to do. Instead, he landed a weekend job at a bookstore and spent the next five years reading JG Ballard novels, contemplating life, and wondering how to get an interesting new take on technology, science, politics and (occasionally) animals. In 2005 he resumed his studies when Bruno Latour occupied the Spinoza chair at the UvA, which opened his eyes to doing philosophy 'by other means'. He finished his MSc in Delft with Ibo van de Poel by studying the ethics of the 'membrane bioreactor' at engineering firm DHV, and his MA in Amsterdam with a thesis on rare hamsters, organ donation, childhood ADHD and high-rise pig farms, supervised by Gerard de Vries.

In 2006 Michiel Korthals and Volkert Beekman hired Clemens as a PhD student at the (then) Applied Philosophy group of Wageningen University, to write a dissertation on the ethics of farmers. The next four years he spent amidst farmers, cows, pigs, students and books, while also promoting Wageningen student debate as a board member of the RUW foundation. In the final of his four years in the Dutch PhD system he initiated a project to design, together with designers of the Utrecht School of the Arts, a video game for pigs and humans to play together. This led him to give a series of public talks and a range of national and international (and regional) media interviews – but not to finish the PhD. Instead, in 2010 he went straight on to become a 'post doc' at the Geography Department of King's College London. Together with Jamie Lorimer, he studied 'rewilding' as a form of nature conservation, in particular focusing on the

Oostvaardersplassen nature reserve and the dubious history of the back-bred de-domesticated Heck cattle living there. The latter eventually led him to feature as an on-site expert in the National Geographic Channel documentary 'Hitler's Jurassic Monsters'. After returning to the Netherlands in 2011, he became a 'post doc' at the Philosophy department of Utrecht University, on a project researching the (lack of) public appreciation of the welfare of fish, in collaboration with Franck Meijboom and Bernice Bovenkerk. In 2012 and 2013 he combined this with part time teaching jobs at Wageningen University and Utrecht University, teaching ethics and philosophy of science to students of pharmacy, veterinary science, disaster studies, landscape architecture, ecology, biology, and the earth sciences.

Besides his academic output, he has given talks and written book chapters for broader audiences on art, architecture, nature and animals. And he has been involved in various artistic performances and design workshops in relation to nature, agriculture and food. In 2013 he researched the public appreciation of 'in vitro meat' for the Dutch ministry of Economic Affairs with Cor van der Weele. With Jeroen Kramer he set up an elective course 'Environmental Humanities: Wageningen Goes Arts & Design' in which Wageningen students team up with design students of the Rietveld Academy for the Arts in Amsterdam. Currently Clemens is a lecturer and 'post doc' at the Cultural Geography as well as the Forest and Nature Conservation Policy chair groups of Wageningen University. He is a board member of the Dutch Society for Bioethics (NVBe), organizes the national 'Day of Environmental Philosophy', is a guest lecturer at several art schools, and again wondering what to study next. Meanwhile he and the love of his life have been blessed with two enthusiastic toddlers with whom they live in Rotterdam.

Publications

Publications from this thesis

- Driessen, C. (2012). Farmers Engaged in Deliberative Practices; An Ethnographic Exploration of the Mosaic of Concerns in Livestock Agriculture, *Journal of Agricultural and Environmental Ethics* 25(2): 163-179 (chapter 2).
- Driessen, C., Korthals, M. (2012). Pig towers and In-vitro meat: disclosing moral worlds by design. *Social Studies of Science*, 42(6): 799-822 (chapter 3).
- Driessen, C., Heutinck, L. (2014). Cows desiring to be milked? Milking robots and the co-evolution of ethics and technology on Dutch dairy farms. *Agriculture and Human Values*. (online first) (chapter 4).
- Driessen, C. (2014). Animal Deliberation. In: M. Wissenburg and D.Schlossberg (ed.), *Animal Politics and Political Animals*. Palgrave Macmillan (in press) (chapter 5).
- Driessen, C, Alfrink, K, Copier, M, Lagerweij, H, Van Peer, I, (2014). What could playing with pigs do to us? Game design as multispecies philosophy. *Antennae, the Journal of Nature in Visual Culture* (forthcoming) (chapters 6 and 8).

Other peer reviewed publications

- Driessen, C., Lorimer, J. (2015). Back-breeding the aurochs: the Heck brothers, National Socialism and imagined geographies for nonhuman Lebensraum. In: C. Minca and P. Giaccaria. *Hitler's Geographies*. University of Chicago Press (under review).
- Lorimer, J., Driessen, C. (2014). Wild experiments at the Oostvaardersplassen: rethinking environmentalism in the Anthropocene. *Transactions of the Institute of British Geographers*, 39: 169–181.
- Lorimer, J., Driessen, C. (2013). Bovine biopolitics and the promise of monsters in the rewilding of Heck cattle. *Geoforum*. 48(8): 249–259.

356 publications

Van der Weele, C., Driessen C. (2013). Emerging Profiles for Cultured Meat; Ethics through and as Design. *Animals*. 3(3): 647-662.

Driessen, C. (2013). In awe of fish? Animal ethics for non-cuddly species (Nemo vs Jaws). In: H. Rocklinsberg & P. Sandin (ed.), *The ethics of consumption*. Wageningen Academic Publishers, pp. 251-6.

Non peer reviewed book chapters

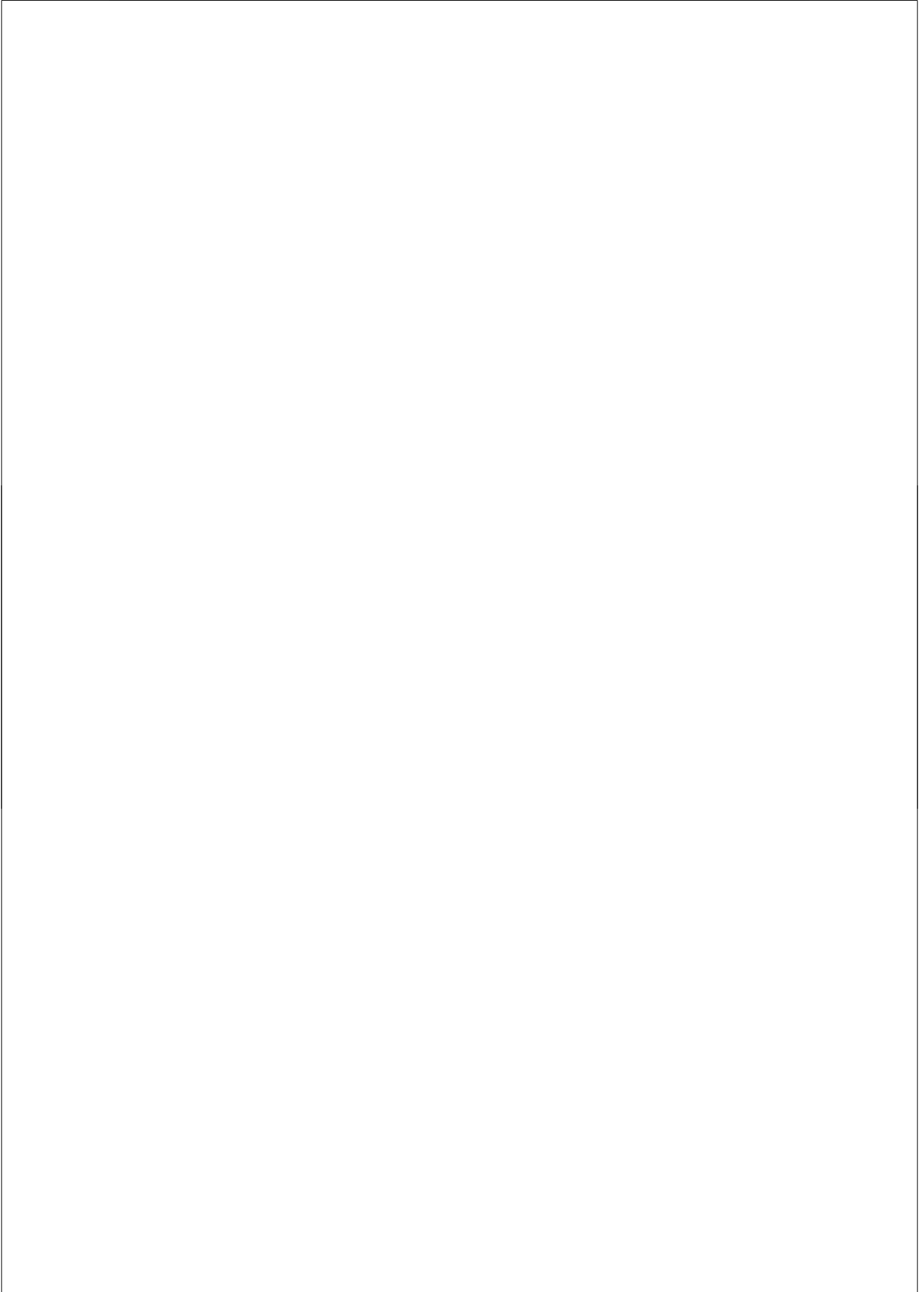
Van der Weele, C., Driessen, C. (2014). In vitro meat as animal liberation. In: *The In Vitro Meat Cookbook*. Van Mensvoort, K., Grievink, H.J. (ed.) BIS Publishers, pp.76-88.

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Driessen, C. (2013). 'Anthropocentrism'/'Menscentrisme'. In: Gevers, I. (ed.) *Yes naturally; a new vision for ecological intelligence*. Rotterdam: Nai 010 Uitgevers/Publishers, pp.77-91.

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Driessen, C. (2009). 'One Day these will be Beautiful Ruins Too'. In: Kramer J., Van der Veer, M. (ed.), *Citydust: KramervanderVeer at the Venice Biennale*.



Clemens Driessen
Wageningen School of Social Sciences (WASS)
Completed Training and Supervision Plan



Wageningen School
of Social Sciences

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
Rathenau Summerschool Technology Assessment	Rathenau Institute	2006	2
International Summerschool: 'A Critical Theory of Technology'	Netherlands Graduate School of Science, Technology and Modern Culture (WTMC)	2008	3
PhD Workshop: Rationality in Science & Technology	Dutch-Flemish Network for Philosophy of Science and Technology (NFWT)	2006	2
PhD workshop: The concept of nature and its cognates in social and natural sciences and humanities	Dutch-Flemish Network for Philosophy of Science and Technology (NFWT)	2009	2
Animal Ethics Summerschool	Research School for Animal Welfare & Ruralia Institute; University of Helsinki	2007	5
Discussion Group 20 th century Ethics; Applied Philosophy Group	WUR	2006-2010	6
Masterclass Ethics of nature: Environment, animals and natural resources	NWO programme 'Ethics, Research and Policy (E&OB)	2008	1
Mansholt Multidisciplinary Seminar (Peer review presentation)	WASS	2009	1
Practical Training Dairy farming	Practical Training Centre Oenkerk, Friesland	2007	
B) General research related competences			
Introduction course	WASS	2007	1.5
Scientific writing	CENTA	2008	2
Qualitative Research Methods	WASS	2006	3
Ethical Dilemmas for Life Scientists	WUR	2007	1
C) Career related competences/personal development			
Guest Lecture 'Food Ethics'	WUR	2007	1
Lecturing: 'Analyse van een Probleemveld' (Food & Health; Disasters)	WUR	2008; 2009	1

PhD Council (WASS & WUR)	WUR	2008- 2009	1.5
Stacking pigs: Dutch pig tower debates and the changing nature of ethical livestock production	Conference of the European Society for Agriculture and Food Ethics (Eursafe)	2007	1
Participation or demarcation? Animal science and animal ethics in action	Conference of the Society of the Philosophy of Science in Practice (SPSP)	2007	1
Cows Desiring to be Milked: Dairy Farming Ethics and the Development of Automated Milking Systems	Conference of the European Association for the Study of Science and Technology (EASST/4S)	2008	1
Technologies as disclosing moral worlds; Shifting the ethical focus from risks and side effects to ethical learning processes	Conference of the Society for the Philosophy of Technology (SPT)	2009	1
Ethics in transition; what system innovators could learn from the abolition of slavery and the emergence of fair trade.	Conference of the Knowledge Network for System Innovations and Transitions (KSI)	2009	1
Designing a computer game for pigs; to create a playful interface between animals, science and ethics'	Conference of the European Association for the Study of Science and Technology (EASST/4S)	2010	1
Board member	RUW Foundation	2009 - 2010	1
Total			40

*One credit according to ECTS is on average equivalent to 28 hours of study load

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(c) Clemens Driessen 2014

Cover: 'Landscape with milking robot and cows', photomontage by the author, 2009.
Based on a photo of the mobile robot *Natureluur* by the author and the painting 'Landschap met vee' by Jan Kobell, 1804 (Rijksmuseum Amsterdam).

Image back cover and on pages 166, 174, 175, 176, 177, 178, 327, and 352:
'Playing with Pigs' (HKU/Wageningen University).