What makes human-animal relations ”organizational’? The de-scription of anthrozootechnical agencements

Antoine Doré, Jérôme Michalon

Article

Organization
2017, Vol. 24(6) 761–780

DOI: 10.1177/1350508416670249
journals.sagepub.com/home/org

What makes human–animal relations 'organizational'? The de-scription of anthrozootechnical agencements

Antoine Doré
INRA, UMR AGIR 1248, France; Michigan State University, USA

Jérôme Michalon
Centre Max Weber (UMR 5283), France

Abstract

Questions concerning animals' role in society have received little attention from Organization Studies. This article develops and tests some theoretical and methodological propositions aimed at contributing to the elaboration of an analytical framework for interpreting our organized relations with animals and furthering our understanding of what makes human–animal relations 'organizational'. First, examining the role of animals in the 'non-human turn' that has been emerging, especially with the Actor–Network Theory and the Symmetrical Anthropology project, it adresses the limits of the 'non-human' category to analyze situations of coordination of collective action involving animals. It then develops the concept of anthrozootechnical agencement to envisage the role of animals in the course of action through the lens of their relational properties and applies the notion of script to propose an operational formulation of the specifically organizational trials to which these particular agencements are subjected. Based on three case studies (the role of the leash in the organization of human–dog relations, the management of wolves' return to France, and the production of milk on a dairy farm), this article shows that two main types of operation make human–animal relations 'organizational': first, the organization of anthrozootechnical relations is constituted by and constitutive of the combination of three types of specifically organizational test to which these particular agencements are subjected (the performance test, the coherence test, and the dimensioning test); second, the work of organizing anthrozootechnical relations then consists in elaborating, executing, and transforming heterogeneous scripts that are never strictly indexed on the nature (human, animal, technique) of the entities they concern.

Corresponding author:
Antoine Doré, INRA, UMR AGIR 1248, BP 52627, 31326 Castanet-Tolosan Cedex, France.
Email: antoine.dore@toulouse.inra.fr

Keywords
Actor–network theory, animal studies, human–animal relations, organization, script

Introduction

The aim of this article is to develop an analytical framework for interpreting our organized relations with animals. Until now, the literature has focused on human–animal or human–technical object relations and has neglected the study of three-term relations. Our general hypothesis is that coordinated human–animal action often involves technical mediation and that human–non-human interactions can most usefully be described in a framework that transcends dyadic relations. The idea here is to work on several analytical concepts and to propose elements of method that contribute to an operational description of specifically organizational situations characterizing human–animal relations.

This article consists of three main parts. First, we examine the role of animals in the 'non-human turn' that has been emerging, especially with the 'symmetrical anthropology' project (Latour, 1993 [1991]), and discuss the limits of the 'non-human' category to analyze situations of coordination of collective action involving animals. Second, we set out the theoretical framework used to describe the organizational interactions between animals, technical objects, and humans. We then develop the concept of anthrozootechnical (AZT) agencement and apply the notion of script to describe, explain, and theorize the problematic of 'organizing animals'. At this point, three subsections are each devoted to a case study and a specifically organizational test. Finally, we conclude with a more in-depth examination of AZT agencements, with a view to understanding what makes human–animal relations 'organizational'.

'Non-humans': a problematic category

The question of taking non-humans into account in the analysis of social, cultural, and political facts has been a subject of renewed interest in the social and human sciences in recent decades (Grusin, 2015; Houdart and Thiery, 2011). Sociologists of science and techniques, Actor–Network Theory (ANT) scholars in particular, have worked extensively on it, showing that non-humans are part of society and that their presence therefore has to be taken into consideration along with that of humans.

Thus, ANT researchers contributed significantly to the development and evolution of Organization Studies (OS) (Bruni, 2005; Czarniawska, 2009; Dale, 2005; Engeström and Blackler, 2005; Orlikowski, 2007; Woolgar et al., 2009).[1] The diversity of studies on the role of technical objects in the construction of organized action is ample illustration of the non-human turn in OS, but reviewing research on this turn also highlights the minor and even inexistent interest shown in other non-humans: animals. Given the role of ANT in the growing attention paid to technical objects in organizations, we propose to contribute to extending the non-human turn of OS to animals, starting with a critical analysis of the 'non-human' category.

Technical objects constitute the majority of non-humans studied by ANT; animals have a relatively minor and ambiguous place. On one hand, they participate in the accomplishment of 'the social' as objects or standards of knowledge on (almost) the same footing as technical objects. How scientists produced common knowledge on animals? How they constructed knowable animals? The 1980s saw the development of research works based on the idea that animals were not objects of knowledge *sui generis*. From this perspective, it is scientific work that makes certain animals centers of interest and stabilizes some of their properties (e.g. Callon, 1986; Lynch, 1988). On the other hand, animals are sometimes seen more as an otherness constituting 'the social'. In the

mid-1980s, Bruno Latour and primatologist Shirley Strum developed original reflection together on the social link by *comparing* baboons and humans (Latour, 1996; Latour and Strum, 1986; Strum and Latour, 1987). From their perspective, the latter differs from the former in so far as the interactions are framed and mediated by a set of objects, instruments, tools, conceptual devices, and so on, which extend them in space and time. Here, human societies and animal societies are *compared side-by-side*; their relations remain irrelevant.

When they are taken as a research subject and seen as participants in the course of the action, animals tend to be relegated to the world of objects. It is paradoxically often via the detour of the study of objects, and not due to animals' proximity with the human species, that they made their entry into the human and social sciences as entities with agency.

In this article, we argue that the heuristic potential of ANT's theoretical and methodological tools for analyzing human–animal relations is hindered by the human/non-human ontological opposition, just as the nature/society opposition does not enable scholars to take seriously the 'intermediate' and problematical status of animals faced with this alternative.

Many life situations lead us intuitively to note that animals (usually) do not exist as technical objects. They have a milieu, an Umwelt, which Jacob von Uexküll (2010 [1934/1940]) defines simply as the combination of all that animals perceive (the perceptive world) and all that they do (the active world). Many life situations also lead us to note that animals (usually) do not exist as humans. They live in another 'world' than ours, which sometimes crosses ours and sometimes radically differs from it.

Situations of interaction between humans and animals have been amply documented in some studies on ethologists' 'partner animals' (Birke et al., 2004; Crist, 1997; Despret, 1996, 2004; Haraway, 1989). From our perspective, this work is of particular interest for two main reasons: it accounts for the ways in which animals can be active partners in knowledge production, rather than entities transformed into abstract analytical objects, and unlike a substantial part of the *Animal Studies* literature, it emphasizes the performative dimension of the scientific devices participating in an agentivity of animals that is not postulated in advance.[2] Yet, apart from a few more recent exceptions (Haraway, 2005, 2008; Tannen, 2004), these studies focus primarily on particular situations of knowledge production. And although they are undeniably heuristic, such situations have certain limits for the analysis of more ordinary and prevalent situations of 'living with' animals. The work of Animal Studies scholars (Katcher and Beck, 1983; Taylor, 2013) has not really integrated the organizational dimension of these situations, above all because they generally focus on dyadic relations (Michalon et al., 2016). Our aim is therefore to propose an analytical framework enabling us to further our understanding of what makes human–animal relations 'organizational', notably in day-to-day organizational situations.

Describing the organizational interactions between animals, technical objects, and humans

How can our organized *relations* with animals be interpreted? In this section, we seek to answer this question, in two steps. First, we develop the concept of AZT *agencement* to examine the role of animals in the course of action, through the lens of their relational properties. We then apply the notion of script to propose an operational formulation of the specifically organizational trials to which these particular agencements are subjected. These two steps enable us to put forward a series of hypotheses that we test with three empirical case studies in the following sections.

The qualifier '*anthrozootechnical*' supports the idea that the attention paid to animals should not be accompanied by a loss of attention to techniques (Doré, 2011): relations between humans and animals are also mediated, more or less directly, by objects; hence, they often involve what

Madeleine Akrich (1993) calls 'technical mediations'. '*Anthrozootechnical*' also emphasizes the fact that the situations we study generally concern human beings, animals, and techniques bound in relations of solidarity so that their ontological statuses of humans, animals, or objects become entangled or even combined. The status of human being, animal being, or object being is never completely pure, unambiguous, and definitively stable.

The concept of *agencement* is furthermore intended to analyze the modalities of establishing heterogeneous and mobile entities caught in multiple and fluctuating relations. It is defined by Gilles Deleuze as '*a multiplicity comprising many heterogeneous terms, which establishes ties, relations between them, through ages, sexes, reigns—of different natures. Hence, the only unit of agencement is co-functioning* […]' (Deleuze and Parnet, 1977: 84). Describing an agencement is therefore a matter of accounting for the way in which '*heterogeneous entities hold together*', and the conditions of '*coexistence*' of different entities and of the '*sequence*' of connections through which they are linked (Deleuze and Guattari, 1980: 403). As Michel Callon (2016) clearly showed in economic sociology, the concept is an eminently empiricist one that relates to the organization of the market in action, rather than simply the aggregation of transactions. Through the description of material and cognitive mediations in market encounters (Muniesa et al., 2007), the notion of 'market agencement' redefines the economic actor as '*made up of human bodies but also of prostheses, tools, equipment, technical devices, algorithms, etc.*' (Callon, 2005: 4). In our case, that enables us to analyze the modes of AZT coordination, without seeking to attribute inherent properties and fixed ontologies to entities.

The concept of agencement can therefore not be a substitute for that of organization. Organization is envisaged here as a particular but not exclusive form of agencement. In order to propose an operational formulation of the organizational specificity of certain forms of agencement, we suggest the notion of '*script*'. Based on the proposition of Akrich (1992) and then of Latour (2013 [2012], 2013), we argue that organization is a specific mode of agencement that consists in producing, monitoring, executing, and diverting scripts and in making them coherent. The concept of script is not new. The propositions of Roger Schank and Robert Abelson (1977) concerning cognitive scripts have largely been taken up and expanded on within OS to analyze the predictable sequences of behaviors and interactions in organizations (Gioia and Poole, 1984; Lord and Kernan, 1987; Poole et al., 1990).[3] The concept of script has also been mobilized and enriched in ANT. Akrich (1992) has made it a pivotal concept in the 'de-scription' of technical objects and the role they play in the heterogeneous networks of human and non-human actants.[4] Latour has extensively rearticulated this concept of script in more recent work in which he seeks to define the specific mode of existence characterizing organizations. He argues that talking or acting organizationally consists in making or fulfilling scripts (Latour, 2013). Whether it be a meeting between friends or a United Nations conference, these scripts are action programs that define the roles of many human and non-human entities, which in turn establish the referential indications that perform their behaviors and engage them a common 'story'.

By 'script' we mean the material and/or narrative translation of a program of action that stages and performs behaviors and situations of action and interaction between various entities, with a greater or lesser degree of success. A 'script' could also be defined as an 'instruction manual' embodied in a text or an artifact: the recipe is a textual translation of the program of action 'preparing a meal' (i.e. a series of tasks to obtain the meal; Conein, 1990); the heavy key fob of a hotel is the material translation of the following program of action '*Do not forget to bring the keys back to the front desk*' (Akrich and Latour, 1992). Thus, the recipe and the heavy key fob embody a model of coordination and selection of actions through material and/or textual scripts.

In this article, we argue that our organizational relations with animals should be understood by the de-scription (description of scripts) of AZT agencements. First, this argument is based above

all on a cross-cutting proposition: the concept of script maintains its full heuristic scope in the framework of the analysis of situations involving animals. Second, this argument underpins the project of an analysis of specific processes in and through which organizations are redefined and recomposed in relation to particular situations involving animals. These processes can be qualified as *tests*, that is, situations where the real can resist, in the canonical sense defined by Latour (1988 [1984]: 158). Here, they more specifically form *organizational tests*, where the organization—although it does not denote '*a palpable phenomenon*' (Garfinkel, 1956: 181; Strong and Dingwall, 1983)—is both experienced and set in the course of the action and where it becomes descriptible as an experiential reality. Finally, this argument can be broken down into one main hypothesis and two additional ones:

In/different scripts. AZT agencements are organized by different types of scripts (human–animal, animal–object, and object–human). The nature of these scripts is however not indexed on the nature of the beings. It is rather the scripts and the modalities of their production and their execution that compose and recompose human, animal, and technical ontologies which are distinct and stable to varying degrees. For research purposes, it is, however, important to distinguish three main modes of possible relations between a human and an animal: (1) an anthropotechnical relation directed at the animal, where the latter is mainly considered by the human as an object, as a thing without a milieu, without semiotic skill; (2) an anthrozoological relation directed at the animal, where the human considers that he or she is dealing with an entity that lives in its own world and is the center of this world; and (3) an anthropological relation directed at the animal, where the human thinks of the animal as an entity that lives according to the human being's world, with appreciably identical means of perception and action.

Interconnected scripts. The organization of AZT agencements cannot be summed up as an addition of heterogeneous scripts; it stems from interconnections between them.

Script framing. Scripts define frameworks of individual and collective behavior. They set deadlines, boundaries, time frames, rhythms, distances, intervals, amplitudes, and so on. They compose modes of synchronization and coordination of varying importance in space and time.

We are now going to defend these hypotheses one-by-one, by means of three different case studies involving different categories of animals (pets, wild animals, and livestock), on different scales (from locally situated interactions to large international organizations), and with different organizational status (from domestic informal organizations to formal political or industrial organizations). Each case will serve non-exclusively to exemplify one of the properties of the scripts presented above and to identify and describe three types of specifically organizational test (Latour, 2013 [2012]) to which AZT agencements are subjected: *the performance test* (Does the script work?), *the coherence test* (Can the multiple scripts that willy-nilly engage a given entity be reconciled?), and *the dimensioning test* (What is the extent of the organization of an AZT agencement?). We will see in section 'Discussion' that these tests are interdependent and that they concern all three case studies.

What is a leash? The performance test

When we think of the relationship between humans and dogs in the Western Areas, one particular object immediately comes to mind: the leash. Today this object governs human–dog relations in the urban context of these areas. Traditionally used for hunting, training or on draught dogs, the leash acquired a particular status from the mid-19th century in Western Europe. At the

time, numerous measures were taken to control animals in towns: stray dogs were prohibited, dogs without owners were put down, and dog taxes were collected (Baratay, 2011). The regulation of dogs' presence in urban areas was consequently gradually associated with the issue of private ownership of animals: being a dog in a town implied having a human owner. This association was materialized in the leash (Pierre, 1997): having a dog on a leash attested to and participated in a form of responsibility that dog owners accepted, for their acts and more broadly for the animal's life. The leash thus became a key technical object in the organization of human–dog relations in many urban areas.

But what is a leash? In a nutshell, this object can be defined as a thong of variable length, of which one extremity is attached to the animal by means of a collar or a harness, while the other end is intended to be held by a human hand. What could be simpler? Indeed. But if we look more closely at this ordinary object, we see that there are different types of leash and different ways of using them. Hence, a variety of scripts link dogs and leashes, leashes and humans, humans and dogs, to form heterogeneous agencements.

On the dog's end, the leash is generally tied to a collar. The animal is attached at its neck. The owner can thus control its movements by resisting the pull on the leash, to a greater or lesser degree. Apart from the soundness of the leash and the human's physical strength, the collar has a repressive role on the animal: the pressure exerted on its neck dissuades it from moving, otherwise it is strangled. This enables the owner to restrict the movements of an animal that is potentially stronger than he or she is. Here, controlling movements is not the only function of the leash. It also serves to send warning signals or to inflict sometimes violent punishment, by jerking on the leash. Some types of collar are designed to increase disciplinary functions, either by accentuating the strangling, or by producing pain from pointed metallic studs on the inside of the collar, or else by sending electric or sound impulses to prevent the animal from barking or any other behavior deemed to be undesirable. In parallel with the development of this type of animal control device, another approach is to use a harness instead of a collar. This object, placed under the animal's neck and forelegs, spreads out the pressure exerted by the leash and thereby relaxes that on the neck. Although the physical tension of this type of leash is enough to contain the movements and behavior of small dogs, it rapidly becomes unfeasible with many stronger animals. The harness therefore evidences and participates in a relation to the animal that generally cannot be summed up as one of control. On the owner's side, the end of the leash generally consists of a ring for the person's hand. In most cases, this ring is simply a loop formed with the thong attached to the animal. Other types of leash have more sophisticated systems. The ring may, for example, be detachable, by means of a brass clasp. It can also have various shapes that may be designed for comfort, ranging from a quilted ring to a real gauntlet surrounding the handle of a neoprene-padded strap, to reduce any shock from the animal's pulling.

The public space contains numerous signposts signaling dog owners' obligation to keep their animals on a leash or, occasionally, indicating the possibility of letting them off the leash (in specific places such as dog parks). The brief description of the 'leash' object presented above points to a wide variety of possible modalities for executing these scripts that organize human–dog relations in urban areas. The role of dogs and their owners prescribed by these signposts can be instantiated in multiple ways and be based on contrasting conceptions of performance, that is, a successful management of relations between them. Two main practical significations of dog–leash–human agencements can be distinguished: the leash as a tool of coercion of a dog seen as an 'object' reacting to signals and the leash as a tool for communication with a dog seen as a 'partner'. In the former, the organization of the human–dog relations is governed by training activities in which the leash serves to control the animal by constraining it, in order to ensure its obedience in any situation. From a behaviorist perspective of negative conditioning, 'punishment' causes the animal not

to reproduce a particular behavior considered to be inappropriate. In these situations, the leash may be equipped in a way that inflicts pain on the dog (e.g. metallic studs) while protecting the owner from potential injury caused by the animal's pulling (e.g. the neoprene gauntlet). In the second case, relations between the owner and the dog are envisaged as inter-individual. Here, the leash also has an important role, but it is thematized differently in the framework of practices often qualified as 'canine education', where it serves to transmit messages to which the animals have to learn to respond.

But alone the leash does not determine the nature of human–dog relations. The same object can be used for coercive purposes or to enhance interaction, depending on the leash itself, on the human, and on the animal. Various uses of the leash—both human and canine—bear witness to and participate in very different agencements: on one hand, the dog can act as an intelligent, interactional being with whom one may communicate, or a recalcitrant being that has to be subdued with physical force; on the other hand, the human may adopt the role of the dog's 'partner' and educator, even its significant other, or that of 'trainer' and 'dominator'. The leash participates in the production and transformation of these different modes of existence (Michalon, 2014). Sometimes a coercive tool, sometimes a communication tool, it is also reconfigured by these agencements.

The study of the role of the leash in the organization of human–dog relations in urban settings is a fine example of the fecundity of the AZT agencement concept. It is precisely when the performance of the scripts is tested that the organization of an AZT agencement is stabilized or not and that the behavior and nature (human, animal, and technical) of the beings caught up in these agencements are established. In some agencements, the leash participates in the establishment of the dog as an 'object' by compensating for or more or less coercively channeling certain behavioral properties of the dog, to ensure that it knows and keeps to its place in its owner's world. In other agencements, the leash contributes to establishing a dog as a 'partner animal' that participates—with these specific means of perception and action—in the elaboration and execution of scripts, and thus develops original forms of reciprocity with its owner by demonstrating an 'understanding' of the humans with whom it lives and acts. Through this very simple example, we see how the concept of AZT agencement can unfold the unsuspected vastness of implications of *a priori* insignificant organizational situations in our relations with animals. But the organization of AZT agencements is rarely the sum of such a limited number of scripts. It is more often a matter of complicated interconnections between numerous heterogeneous scripts, entangled in complicated interconnections, as we will see in the emblematic case of the organization of wolves' reappearance in France.

Wolves at the gates: the coherence test

The wolves are back! In Norway, Germany, Switzerland, France, and elsewhere, these large carnivores have returned to areas in which they were exterminated a few decades ago. This has generated extensive debate, as more or less structured worlds drift apart to form unstable and conflicting networks. Livestock farmers, naturalists, tourists, sheep, hunters, mouflons, local councilors, and so on—the fate of the inhabitants of the colonized areas is once again inextricably entangled with that of the wolves, in widely diverse and sometimes radically antagonistic ways. Killers of sheep, guarantors of a balance in the ecosystem, game predators, symbols of wild life: wolves interfere in these areas in ambivalent, multiple, and discordant forms—forms that deciders have difficulty articulating coherently and in ways acceptable to all (Doré, 2013). The organization of the management of wolves' return to France is therefore a particularly fine illustration of the implications of the interrelatedness of the heterogeneous, distinct and even contradictory scripts in which certain entities are engaged, whether they like it or not.

As a protected species, wolves generally may not be killed or trapped. Farmers are therefore compelled to live with these predators. The State provides financial and technical aid for them to install protective devices for their flocks. These set ups consist of new objects scattered around pastoral spaces, and which literally restructure the complex agencement whereby humans, sheep, the mountains, pastures, watering points, and so on hold, together. For all these entities, it is now necessary to compromise with the wolves and therefore, quite often, with electrified enclosures, livestock guard dogs, shepherds' assistants, sound and visual alarms, mountain huts, pastoral technicians, and so on. The entire organization of the shepherds' work is thus transformed, constrained and reoriented by the relatively discreet but sometimes highly tangible presence of '*threatening wolves*'. While some farmers readily adopt protective measures, many refuse them, considering that they are incompatible with their conception of '*work well done*' and/or that '*accepting protective measures means accepting the wolves*'. Yet, when wolves encounter these set ups protecting a flock, they move over to the unprotected pastures nearby. The refractory farmers are thus technically forced to accept the organization of the wolves' conservation that, in their eyes, these measures embody. In so doing, they witness a substantial decrease in the damage to their flocks, even if the protective measures are never infallible (some wolves manage to get round attempts to keep them away).

Apart from major changes in the organization of the shepherds' work, all of these measures institute new relations and bring to the fore sometimes unexpected actors. The introduction of livestock guard dogs on mountain pastures, for example, has had its surprises as walkers have on occasion been bitten. The stakeholders of tourism[5] then become seriously involved, not to boast the virtues of the return of the wolves as a factor in the development of green tourism, as many of its advocates emphasize, but on the contrary, to deplore the problems that it generates for them:

> Some people cancel their reservation for a cottage when they find out that it's situated in an area where there are wolves. When there are wolves there are guard dogs, and there is fear of being bitten on holiday, of not being able to leave their kids to play outside, of not being able to do mountain biking, and so on. (Tourism official at the Conseil Général de la Savoie during a committee meeting about the wolves, 2009)

Moreover, the introduction of these dogs causes new and ambiguous relations to develop between those who define the conditions of eligibility and implementation of the protective measures (representatives of the State), those who promote them (nature conservation organizations), and those they are intended for (farmers and shepherds). Several court cases in which farmers were sued for unintentional injury caused by their dog to walkers have compounded farmers' exasperation. They have called into question the coherence of the organization of flock protection, as they are often accused in court of having applied measures that were in fact prescribed by the State.

As in our first case study, managing the wolves' return implies and generates various performance tests. We see, for example, that the organization of relations between wolves and farming activities depends on a set up for protecting the flocks.

Not unlike the case of the leash, the efficacy of this set up depends on the instantiation of a number of roles through various performance tests. On one hand, it contains a description of the predators which, in a sense, paints a picture of the physical and ethological 'archetype' of 'threatening wolves'. Some of the techniques used are intended to *physically* complicate the wolves' intrusion (protective nets, taking the flocks into the sheepfold, shooting at the predator), while others rely more on certain *behavioral* traits of the undesirable animals (sound and light devices, guardian dogs, warning shots). The system moreover prescribes relatively precise roles for the users, and the implementation of protective measures implies radical changes, not only by the shepherds but also by the sheep.

The organization of the protection of flocks proves to be quite effective by significantly reducing predation pressure. Yet it is constantly under strain: every solution (often partial and temporary) to a particular problem sets off new ones in other respects, in other places, and so on. Compared to our first case study, managing the return of the wolves implies and generates turbulent agencements involving multiple entities in numerous scripts that are more or less compatible and coherent. First (the quantitative overflowing of scripts), *organization in one place triggers disorganization in another.* Hence, reducing the pressure of predators on the flock sometimes also means increasing sanitary threats due to the sheep being penned in at night, or family problems when the farmer has to spend nights out in the mountains to watch over his animals. Second (overflowing of actants), *a new actor, animal, or object never appears alone; it is often attended by a whole series of new entities with problems of differing degrees*. For example, the introduction of guard dogs in mountain pastures is accompanied by the appearance of mountain bikers who fear for their calves, of hunters of small game who hate these dogs for killing chicks, and so on. This example of the introduction of guard dogs also illustrates some forms of unexpected misappropriation of scripts (qualitative overflowing of scripts) and 'reprogramming' of the initial role of entities. From the point of view of the organization of green tourism, wolves go from the status of a potential resource to that of an obstacle.

The description of the AZT agencement that constitutes this emblematic case of wolves' return to France affords us insight into who these wolves struggling with humans are, and who these humans battling against the wolves are, and to account for the competences of both. It enables to show the balance of power in which each of them deploys a particular type of intelligence. On one hand, the humans confronted with the wolves constantly have to learn, continuously groping and making concrete changes that lead them to endeavor to '*function like wolves*'. On the other hand, the wolves are actually endowed with somewhat surprising and unsuspected competences faced with humans and their allies.

The organization of relations between wolves and farmers is truly a test of coherence concerning the mutual influences between a multitude of scripts. The example of guide dogs and their blind owners, is also evocative about that issue. Not only does the leash-harness device play a crucial part in the accomplishment of real work of mutual coordination and adjustment between a guide dog and its visually impaired owner (Mondémé, 2016), it also embodies the articulation of different scripts. The urban environment in which guide dogs and their owners move about is extremely dense: they encounter traffic, pedestrians, cyclists, traffic lights, strips on the ground with rough surfaces, sidewalks, obstacles all over these same sidewalks, and so on. The list of scripts that the dog-owner team has to take into account to be able to get from point A to point B is almost infinite. The same can be said of any movement in urban spaces, but here the absence of one of the five senses (sight) requires the delegation to the dog of perceptive competences and visual understanding of the environment, as well as the use of a technical device to transform this visual information into physical information. We see here that performance requires the alignment of various scripts, to achieve coordinated action. The performance of AZT agencements is thus linked to everything implicit in the creation of coherence of various heterogeneous scripts that are entangled in complicated interconnections.

In AZT agencements, each script is involved, in one way or another, in the dynamics of the other scripts with which it maintains varying numbers of relations that may be direct and coherent, to a greater or lesser degree. Relations of complementarity, continuity, or contiguity are established between the different scripts, while certain zones of tension, discontinuity or discord and hinder or even paralyze the definition and implementation of a coherent and unquestionable organization. Each of the scripts is, in its own way, caught in a set of mutual implications through which an AZT agencement, articulated and bearable to varying degrees, is composed. By turning now to the case

of dairy farming with Holstein cows—a fine illustration of a 'globalized' organization of relations with animals—we are going to see that the agencement of these scripts is also a process of varying degrees of synchronization and coordination that contributes to the spatio-temporal framing of organized action.

Global dairy cows: the dimensioning test

Milk has become a food of global importance. A significant proportion of the hundreds of millions of liters produced every year is the fruit of a worldwide organization of the dairy industry, based *inter alia* on the meteoric rise of the Holstein breed. The rapid growth of this dairy breed has attended the general movement of specialization and intensification of farm production systems. Designed to produce large quantities of standard milk for multiple purposes (milk powder, butter, cheese, etc.), it quickly replaced other breeds. Often considered to be the ultimate 'animal machine', Holstein is the product of a combination of innovations in zootechnical farm management, animal selection and husbandry, and diet. First, in the late 19th century, zootechnicians developed standardized biometric protocols to classify and calibrate animals: length of the body, chest size, hip width, udder size, and so on. All these measurements were correlated to the cows' productive performance. Then, with the generalization of artificial insemination and, to a lesser extent, embryo transfer and in vitro fertilization, it became possible to multiply on a global scale the descendants of animals rated with the best performance. The flow of animal biological resources, no longer based only on the circulation of animals, intensified; frozen semen became a '*convenient vehicle*' (Vissac, 2006). Finally, the expansion of the Holstein breed was closely intertwined with the industrialization of production and the global trade of maize and soy that provide concentrated fodder crucial to the exploitation of these animals' milk-producing potential. This general trend is continuing today and now also involves the manufacturers of automatic milking machines.

As in our first two case studies, we see that various performance and coherence tests are at the heart of the organization of AZT relations in the framework of Holstein milk production. Managing Holstein milk production implies and generates complex agencements involving multiple entities in numerous programs of action that are more or less effective, and more or less compatible: food, reproduction, genomic selection, automatic milking, and so on. But above all, compared to our first two case studies, the analysis of Holstein milk production enables us to highlight the importance of varying degrees of synchronization and coordination in the organization of AZT relations. This case study enables us to grasp the dimensioning tests that determine our organized relations with animals and the extent of AZT agencements. We set out here with a sequence of ordinary action on a dairy farm.

This is a French farm with 150 dairy cows, equipped with two milking robots. Between the stall and the milking robot, Eglantine has just entered the waiting area before being milked. This cow is the daughter of a genomic young Canadian bull whose genetic potential was evaluated by genome selection, that is, based on its DNA map. Its semen was commercialized as soon as it was sexually mature, whereas 5 or 6 years were previously necessary, when bulls' potential could be known only by measuring the observed performance of their descendants. After specific hormonal treatment and diet, Eglantine was given an embryo transplant. The last calf that she produced is the offspring of the best cow in the herd and a North American bull specifically selected for the milking robots: its daughters have udders that lend themselves to automatic milking. Feeling her udder swelling with milk, Eglantine decides to go to the robot of her own accord. After a chip in her ear is detected, she is allowed to enter. The milking starts: a personalized ration of concentrated feed descends into the trough, the udder is brushed and washed, the teat cups are put in place, the first drops of milk analyzed, and the milking starts. The robot is equipped with a real little laboratory that generates

measurements and indicators of dairy, reproductive, sanitary, and food performance. Specific applications on his smartphone enable the farmer to monitor the milking from a distance and in real time and to share the numerous data he has with technical advisers (veterinarians, nutritionists, etc.). He nevertheless frequently goes to the stalls to check his cows and the robot, although the milking device allows him to '*no longer constantly be* into *them*' (Lagneaux and Servais, 2014).

This ordinary scene in the daily life of a dairy farm involves a wide variety of scripts (genetic, reproductive, food, health, milk market, etc.) connected to times, actors, and places at varying distances, all of which participate significantly in framing the individual and collective behaviors of the humans and animals on the farm. For this to work, the cows have to '*collaborate*' (Porcher, 2016; Porcher and Schmitt, 2012) in the smooth functioning of the robot: learn to go to be milked, without the farmer; respect the daily number of times it is milked; remain calm in the robot; and so on. The farmer must also comply with certain rules directly or indirectly related to the robot. Based on data generated by the robot, the agent can monitor the functioning of the device, the inseminator, the animals' sexual activity, the vet, the sanitary state of the farm, the nutritionist, the food performance of the production system, and so on. All these actors can prescribe corrective measures to the farmer. The robot, cows, and farmers are agenced in a configuration tightly framed by scripts which are neither completely human-oriented, nor completely technical-oriented, nor completely animal-oriented (here, the robot manages the cow and the farmer, just as the cow and the farmer, in their own way, manage the robot). These scripts are neither completely here and/or now, nor completely elsewhere and/or anterior (the nutritionist from the regional technical institute, the breeder-selector from a farm in Ontario that bred Eglantine's father, the village vet, the agent selling the robots, etc.—all participate from a distance, with the farmer, in the organization of these daily breeding scenes). Such scripts also imply and generate a sort of rhythm of the organized action: genome selection accelerates genetic progress—the best bulls are very quickly overtaken and replaced by others with better performance and many breeders no longer know the fathers of their cows—and the milking robot totally reconfigures the time of the cows as they can go to be milked at their own pace and the farmers are freed of milking constraints. Thus, the scale of the organization of dairy production is the fruit of multiple tests of dimensioning that set the scale and scope of action, and that also define the forms of temporal frames, the pace.

As for the management of the wolves' return, this case is marked by tests of coherence that bring into play multiple relations of complementarity, continuity, discordance, and non-synchronicity between different scripts. But the description of AZT agencements of milk production also shows the significance of the alignment and serializing of the scripts that define the scope of an organization. Through these dimensioning tests, the daily action of a German village cow can, for example, be connected to the organization of infant nutrition in a major milk powder importer such as China. Dimensioning tests, as well, turns dogs circulation in urban areas into a collective problem but also a matter of responsibility for their owners. The leash is effectively a preferred instrument of policies for managing the co-presence of humans and dogs in urban environments, in relation to various types of public problem: packs of stray dogs, attacks, sanitary problems, road safety (vehicle/dog collisions), and so on. In a sense, it participates in the introduction of public policies aimed at large-scale rationalization of presence and circulation in the public sphere: it delimits certain spaces, induces a control over the movement of dogs and their owners, and so on. The leash also participates in framing daily situated interactions between dogs and their owners: it establishes a maximal distance to be respected between them, localizes and privatizes the human–dog relationship, and so on. It is moreover through these dimensioning tests that the presence of guard dogs for flocks threatened by wolves on a small French mountain pasture is linked to national and European nature conservation policies. A guard dog cannot be introduced on a mountain pasture without this large infrastructure of more or less visible scripts linking this animal to the European Union or to the national

ministry in charge of ecology (which prescribe, finance and organize the introduction of these dogs on mountain pastures in the name of the wolves' protection). Over and above these questions concerning the performance of these protective dogs (largely recognized by the farmers), the choice of whether or not to adopt these animals is in itself a real test of dimensioning for the farmers who, as noted above, consider that '*accepting protective measures means accepting the wolves*' and the national and international organization of their protection. Finally, through these dimensioning tests, referential indications are established. These, in turn, remotely perform the human and animal behaviors that are engaged, willy-nilly, in a common 'history', the importance of which is not (always) suspected. While the test of coherence leads to the actors being *overwhelmed* to a greater or lesser degree by the scripts, as we have seen in the case of the wolves, the test of dimensioning is characterized by other potential effects: being more or less *overtaken* by the scripts. In the former case, it is a matter of being engaged with many heterogeneous, distinct, and even contradictory scripts. The difficulty posed by the test of coherence is of articulating them in a bearable agencement. In the latter case, it is a matter of being affected by actions at a distance (spatial and/or temporal) through the alignment and serializing of scripts which connect—with a greater or lesser degree of reciprocity—an actor here and now to another source of action elsewhere.

Discussion

In this article, we have developed and tested some theoretical and methodological propositions aimed at (1) contributing to the elaboration of an analytical framework for interpreting our relations with animals and (2) furthering our understanding of what makes human–animal relations 'organizational'.

First, we argue that our relations with animals should be understood by the de-scription of AZT agencements. The three case studies presented have enabled us to highlight the fact that coordinated action between humans and animals often involves technical mediations. Our case studies have also allowed us to show that the multiplication of the technical objects observed in certain situations where human–animal relations are organized is not necessarily associated with greater predominance of 'animal machines'. On the contrary, the technique sometimes contributes to a better consideration of 'animality' in the organization of AZT agencements. Closer attention may thus be paid to the animals' own world and to their specific semiotic competences (Doré, 2010). Whether this concerns dogs on a leash, wolves that have to be steered away from flocks, or cows milked by a robot, material devices call on singular, sophisticated, or surprising animal competences as regards the execution (for cows facing milking machines), misappropriation (for dogs on a leash), or avoidance (for wolves faced with devices to protect the flocks) of technical scripts. That is why we propose this concept of 'anthrozootechnical agencements' to do away with the dyadic human/non-human distinction that partially tends to relegate animals to the rank of objects. Finally, the three case studies presented in this article have served to emphasize the fact that human beings, animals, and techniques are caught up in ties of solidarity such as the ontological status of humans, animals, or objects that overlap or even combine. Rather than starting with pre-existing units, preformed subjects, entities constituted in advance, the idea of the concept of AZT agencement is to study the constant movements of construction of cohesion between heterogeneous entities that simultaneously shape the processes of collective agencement, along with those of subjectification and individuation. Thus, unlike substantialist concepts, AZT agencement has a twofold heuristic interest: for Animal Studies and for OS. It avoids reliance on prior distinctions between humans, animals, and technical objects, by taking ontological uncertainties seriously; and it focuses the analysis on organizing processes rather than on organizations (as we show in the following paragraphs on tests and scripts).

Second, this conceptual framework of AZT agencement enables to highlight the fact that what makes human–animal relations 'organizational' involves two main types of operation: elaborating and executing three types of specifically organizational tests, and elaborating and executing heterogeneous scripts. First, the organization of AZT relations is constituted by and constitutive of the combination of three types of specifically organizational tests to which these particular agencements are subjected. In this article, we have looked closely at a specific type of test through a particular case study. At the same time, we have also shown how each of the three cases chosen involved the three types of test every time.

The performance test

Does the script work? Practices and discourses concerning issues of performance and their solutions are part of the important mediations that spawn conventions in organizations (Abrahamson and Fairchild, 1999; Boussard, 2008). In these mediations, performance is explicitly defined as 'what works'. But the keys to success or failure are never given immediately by a state of the world, whether material (techniques), zoological (animals), or anthropological (human); they are built up through anthropozootechnical relations. Performance is measured or tested against variable (and sometimes contradictory) criteria which often do not exist without instruments (e.g. the wolf experiences in its own way the performance of the organization of pastoralism–predator cohabitation through the flock-protection devices). Moreover, these multiple performance criteria each relate to specific conceptions of the activity (of humans and also of animals).[6] It is when the performance of scripts is tested that the organization of an AZT agencement is stabilized or not. At this point, we find the appearance of the practical signification of the behavior of the entities concerned (the roles taken on in the execution of the script) and of the action program. For instance, it is in situated action that the owner becomes the 'partner' or 'dominator' of the dog and that the scripts framing their relationship become 'coercive' or 'educational'. It is also at this point that an entity becomes more 'human', 'animal', or 'technical'. In short, the behavior and nature of beings caught in organizational agencements is a coproduct of the tests of these scripts' performance. Hence, the organization of AZT agencements stems from a doubly performative dimension.

The coherence test

Can the multiple scripts that willy-nilly engage a given entity be reconciled? With the example of the wolves' return to France, we have seen that the organization of AZT agencements cannot be summed up by the addition of heterogeneous scripts. Instead, it brings interconnections between heterogeneous scripts into play. The modalities of putting together scripts in which this entity participates (articulation, avoidance, aggregation, etc.) define a more or less complex ecology of action programs that characterize a way of 'organizationally' agencing human, animal, and technical entities. As Latour points out, the presence of scripts alone is not enough to qualify an organization. There is 'organization' when there is connection and articulation of scripts, when 'nothing, *absolutely nothing*, ensures *that they are mutually compatible*' (Latour, 2013 [2012]: 393). An organization of human–animal relations can succeed only if it is able to create original ties between different entities (human, animal, and technical) aimed at a certain organizational unity. Thus, the question of organizational unity is key to coherence tests: that is where it is tested, not in an abstract way, as if it were already a given, but as a more or less uncertain dynamic in which unity is built, transformed, and adjusted over time.

The dimensioning test

What is the extent of the organization of an AZT agencement? With the example of the organization of milk production, we have shown that scripts define not only the frames of individual and collective behaviors but also their scope and their rhythms. The extent of the organization is not a matter of 'size' or 'embeddedness of scale'; it depends more on the scope of scripts, that is, on their inscription in alignments of varying lengths and ramifications, with other scripts. As Callon and Latour (1981) clearly showed, the difference between micro- and macro-organizations depends not on their 'nature' but on the differing degrees of success of operations of alignment and ramification. The scope of a script organizing the activities of a multinational corporation is larger than that of a script organizing the activities of a craftsman because it is set in a network of connections that are not necessarily more diverse, but are more ramified and aligned. These modalities of alignment and ramification are established through tests of dimensioning. The analysis of these tests of dimensioning therefore aims to account more fully for the multiple and often ambivalent modalities of framing of AZT agencements, through the combined study of face-to-face—or even body-to-body—relations between humans and animals (in the context of abattoirs' organization, dog-lover brigades, vets' consulting rooms, etc.) and 'remote' relations (in the context of the organization of international meat-product markets, sanitary policies for controlling epizooties, campaigns to protect endangered species, etc.).

As we have just seen, each of these tests corresponds to specific felicity conditions; the success or failure of a performance, coherence, or dimensioning test is experienced in relation to different criteria. Yet, these tests are interdependent.

The work of organizing AZT relations then consists in elaborating, executing, and transforming heterogeneous scripts that define and frame individual and collective behaviors, and that have to be inventoried and analyzed. The farmer, the cow, and the milking robot constitute a sometimes unstable agencement that brings into play heterogeneous scripts in which the cow participates actively. With the analysis of the scripts that compose AZT agencements, we see emerging what Akrich (1991: 342–343) calls a '*geography of competences*' (of humans and animals), where technical objects (here, the milking robot) generally play a predominant part. For instance, with the introduction of the milking robot, some of the breeders' competences were delegated to the robot (e.g. which carries out certain automatic analyses on the herd's health) and to the cows (which, for example, manage the rhythm and frequency of their own milking). Furthermore, although the scripts that organize relations between humans and animals, animals and objects, and objects and humans are not (always) equivalent, we maintain that this difference is never strictly indexed on the nature (human, animal, technique) of the entities and that it should not be envisaged as a starting point of the organization of AZT agencements. A difference in this nature is rather one of the possible consequences of the modalities of definition and execution of scripts. Hence, we are not postulating that the scripts organizing interactions between a human and a dog in no way resembles that which organizes relations of the same human and his or her car, employee or scissors. Instead, the description of concrete relations between these heterogeneous entities leads us to point out that these interactions differ radically in certain situations, whereas they are very similar in others: one human may treat her employer 'like' an animal, her dog 'like' an object, her car 'like' a friend, and so on. The challenge is precisely to characterize what 'like' means.

To sum up, AZT agencements present four important characteristics for the analysis of the scripts and tests that make human–animal relations 'organizational': (1) they consist of heterogeneous relations not only between humans, animals, and technical objects but also between humans and others humans, and between animals and other animals; (2) the nature of these relations is never strictly indexed on the nature of the entities (a human being can be treated as an animal, an

animal as an object, etc.); (3) the nature (human, animal, or technical) of entities is a product of the agencement, and the observer should not make prior distinctions on the nature of entities in order to describe how differences emerge in the agencement; and (4) for feasibility reasons, the analysis of these AZT agencements nevertheless implies a minimal preliminary definition of the respective nature of the relations to be observed (human–animal, human–human, human–object, etc.).

Finally, this notion of AZT agencement—associated with the concepts of script and test—is articulated to a conception of the organization envisaged as a particular mode of existence (Latour, 2013 [2012]). If, as several authors have already pointed out (Alcadipani and Hassard, 2010; Czarniawska, 2004; Czarniawska and Hernes, 2005; Gherardi, 2009; Robichaud and Cooren, 2013), this type of approach presents the advantage of 'denaturalizing' organizations, facilitating an analysis of organizing practices, and implementing Karl Weick's (1979) famous proposition consisting of focusing the analysis on organizing processes, rather than on organizations, it seems also to present other virtues with regard to the specific implications of the analysis of the organization of human–animal relations. First, this type of approach enables us to take seriously and to characterize the active participation of animals (and humans) in organizational processes, and thus to account, with a greater or lesser degree of symmetry, for what it means to be human in organizations inhabited by animals and what it means to be animal in organizations inhabited by humans. It enables to show, in particular, how an organization (its performance, coherence, and dimension) is actively tested and enacted by humans and animals, through technical objects. Second, apart from its particular interest as regards the phenomena that arise beyond the limits of formal organizations (Czarniawska, 2009), this type of approach is also relevant for envisaging more 'classical' organizational entities. The analysis of AZT relations in the framework of Holstein milk production can for instance be developed in this direction by focusing more specifically on the organization of industrial agriculture and on the role of cows in the entanglement of economic, financial, legal, and other scripts that constitute the infrastructure of milk production. Furthermore, this type of approach also seems to us to be relevant for accounting for the increase and diversification of the modalities of animals' presence in formal organizations such as hospitals, retirement homes, and so on.

Conclusion

At a time when the concept of multi-specific ethnography is starting to emerge (Kirksey and Helmreich, 2010), OS cannot settle for the ontological human/non-human dichotomy. This divide does not make possible taking seriously the 'intermediary' and problematical status of animals in a growing number of organizational situations.

While the organization of animals may in practice resemble the organization of techniques (anthropotechnical relations with animals) or, more rarely, that of humans (anthropological relations with animals), it seems important to consolidate possible interpretations of our organized relations with animals in a way that takes into account the particularity of certain situations concerning them (anthropozoological relations with animals). We have thus shown that it is possible to consider the specific nature of organizational settings, without the insoluble question of the prior definition of the nature (human, animal, or technical) of the entities considered. Instead, we suggest a minimal definition of the respective nature of anthropological, anthropozoological, and anthropotechnical relations. As OS have concepts and research methods for analyzing the organization of animals based on the modalities of humans' relations with technical objects and with other humans, the theoretical and methodological challenge consists in defining and characterizing better the modalities of their relations with animals. In this article, we have defined and based these relational modalities on the recognition (by humans) of animals' participation in three types of

organizational test: performance, coherence, and dimensioning. The latter participate in the elaboration and execution of scripts, according to specific semiotic aptitudes, that is, according to cognitive capabilities and singular collective and individual competences.

If the ontological human/non-human dichotomy constitutes an obstacle to the description and characterization of the organization of human–animal relations, what about the 'living/non-living' divide? Is it a sound alternative to the 'human/non-human' dichotomy, for extending the non-human turn of OS to animals? We see this proposition as a particularly interesting direction in which to pursue the reflection started here, notably by exploring the possibilities and limits of a generalization of the notion of AZT agencement to other living beings (plants, microorganisms, etc.) and of a contribution of our theoretical and methodological propositions to the relatively numerous studies that propose a non-anthropocentric reinterpretation of Foucauldian theses on biopolitics. Without claiming to explore this question in great depth here, it seems possible, as we reach the end of this article, to highlight that which appears to be one of the main pitfalls in this 'living/non-living' dichotomy. More than ever, '*processes of power and knowledge take into account the processes of life, and undertake to control and modify them*' (Foucault, 1976: 187) to shape what Foucault characterized as biopolitics. We are thus witnessing a very real transition of the ontological referent to which the exercise of power in organizations relates: a transition that is accompanying the growing success of the 'life forms' and of the 'living/non-living' dichotomy as analytical categories in the social sciences. Yet, as Noëlie Vialles (1994 [1987]) so amply showed in his anthropological analysis of the killing of animals in slaughterhouses, '*The contingency and individuality of the biological sphere resists the formal rigour of technical organization*' (p. 51) and, we might add, the formal rationalization of the '*calculating management of life*' (Foucault, 1976: 184). As we have endeavored to show in this article, it is possible to take this '*contingency*' and this '*individuality*' into account empirically in the case of animals which, owing to their particular semiotic competences, participate actively (by resisting, in the case of wolves, or by collaborating, in the case of cows) in the organization of AZT agencement. From this perspective, it is important not to distribute beings according to a living/non-living dichotomy that creates a new boundary, instead of helping to understand the circulation of the agentivity between heterogeneous beings. We need rather to focus on the characterization of the *Umwelt* that allows for a (non-dichotomic) distribution of beings according to their means to perceive (the perceptive world) and to act (the active world; von Uexküll, 2010 [1934/1940]). Although the characterization of animal *milieus* has been studied for a long time, very little attention has been paid to plants and other living organisms. The prospect of generalizing our theoretical and methodological proposals to these other living beings therefore seems limited by this lack of analysis and of interest in these life forms.

While at one stage zootechnics led humans to consider animals as production machines, a number of moral and political questions that have arisen today attest to a transformation of the human/non-human dichotomy, and to a redistribution of beings perceived as means (certain animals and objects) and as ends (humans, increasingly joined by a series of entities, including certain animals in particular). Such transformations have major impacts on the ways in which we organize our relations with animals, from everyday domestic situations to the international food markets. OS are thus faced with unusual situations, the significance and particularity of which they can analyze by learning to be attentive to how they consider the singular experienced world of multiple living beings.

Acknowledgements

The authors would like to thank the editors and the anonymous reviewers for their valuable comments and suggestions to improve the quality of the paper.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Coopigen research project (funding by INRA—Genomic Selection Metaprogram). This publication has been written with the support of the AgreenSkills fellowship program, which has received funding from the EU's Seventh Framework Program under grant agreement No. FP7-609398 (AgreenSkills+ contract).

Notes

1. Science, Technology, and Society (STS) scholars interested specifically in the ordering of formal organizations are rather rare (Grint and Woolgar, 1997; Law, 1994).
2. In *Animal Studies*, animals' agentivity is often taken for granted (Michalon et al., 2016). The role of technical objects—particularly the association between 'animals' and 'objects'—is generally disregarded (DeMello, 2012; Taylor, 2013; Waldau, 2013; Weil, 2012).
3. According to R. Schank and R. Abelson (1977),

   > A script is a structure that describes appropriate sequences of events in a particular context. A script is made up of slots and requirements about what can fill those slots. The structure is an interconnected whole, and what is in on slot affects what can be in another. […] a script is a predetermined, stereotyped sequence of actions that defines a well-known situation. […]. Every script has associated with it a number of roles. When a script is called for use, i.e., 'instantiated' by a story, the actors in the story assume the roles within the instantiated script. (p. 210)

4. 'A large part of the work of innovators is that of "inscribing" this vision of (or prediction about) the world in the technical content of the new object'. It is the end product of this work that she calls a 'script' (Akrich, 1992: 208).
5. Tourism is often the main economic resource of the regions concerned.
6. The effectiveness of the organization of flocks' protection against wolves is, for example, envisaged by humans in very different ways, depending on their perception of wolves' activity. By perceiving wolves as relative biological and ethological invariants, some actors consider that there is a definitive technical solution to the problem of protecting the flocks, and that the differences of performance between one situation and another are directly correlated to farmers' (lack) of competencies. By contrast, other actors, who perceive wolves as competent beings, consider that there is no definitive technical solution to this problem, since wolves are capable of adapting and of learning to 'respond' actively to the technical devices, in order to circumvent them.

References

Abrahamson, E. and Fairchild, G. (1999) 'Management Fashion: Lifecycles, Triggers, and Collective Learning Processes', *Administrative Science Quarterly* 44: 708–40.

Akrich, M. (1991) 'L'analyse Socio-Technique', in D. Vinck (ed.) *La gestion de la recherche*, pp. 339–53. Bruxelles: De Boeck.

Akrich, M. (1992) 'The De-Scription of Technical Objects', in W. Bijker and J. Law (eds) *Shaping Technology/Building Society*, pp. 205–24. Cambridge, MA; London: The MIT Press.

Akrich, M. (1993) 'Les formes de la médiation technique', *Réseaux* 60: 87–98.

Akrich, M. and Latour, B. (1992) 'A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies', in W. Bijker and J. Law (eds) *Shaping Technology/Building Society*, pp. 259–64. Cambridge, MA; London: The MIT Press.

Alcadipani, R. and Hassard, J. (2010) 'Actor-Network Theory, Organizations and Critique: Towards a Politics of Organizing', *Organization* 17: 419–35.

Baratay, E. (2011) 'Chacun jette son chien, De la fin d'une vie au XIXe siècle', *Romantisme* 3: 147–62.

Birke, L., Bryld, M. and Lykke, N. (2004) 'Animal Performances: An Exploration of Intersections between Feminist Science Studies and Studies of Human/Animal Relationships', *Feminist Theory* 5: 167–83.

Boussard, V. (2008) *Sociologie de la gestion, Les faiseurs de performance*. Paris: Éditions Belin.
Bruni, A. (2005) 'Shadowing Software and Clinical Records: On the Ethnography of Non-Humans and Heterogeneous Contexts', *Organization* 12: 357–78.
Callon, M. (1986) 'Eléments pour une sociologie de la traduction. La domestication des coquilles Saint-Jacques et des marins-pêcheurs dans la baie de Saint-Brieuc', *L'année sociologique* 36: 169–208.
Callon, M. (2005) 'Why Virtualism Paves the Way to Political Impotence: A Reply to Daniel Miller's Critique of the Laws of the Markets', *Economic Sociology: European Electronic Newsletter* 6: 3–20.
Callon, M. (2016) 'Revisiting Marketization: From Interface-Markets to Market-Agencements', *Consumption Markets & Culture* 19: 17–37.
Callon, M. and Latour, B. (1981) 'Unscrewing the Big Leviathan; or How Actors Macrostructure Reality, and How Sociologists Help Them to do so?' in K. Knorr Cetina and A. Cicourel (eds) *Advances in Social Theory and Methodology*, pp. 277–303. London: Routledge and Kegan Paul.
Conein, B. (1990) 'Cognition située et coordination de l'action, la cuisine dans tous ses états', *Réseaux* 43: 99–110.
Crist, E. (1997) 'From Questions to Stimuli, from Answers to Reactions: The Case of Clever Hans', *Semiotica* 113: 1–42.
Czarniawska, B. (2004) 'On Time, Space, and Action Nets', *Organization* 11: 773–91.
Czarniawska, B. (2009) 'Commentary: STS Meets MOS', *Organization* 16: 155–60.
Czarniawska, B. and Hernes, T. (2005) *Actor-Network Theory and Organizing*, p. 360. Copenhagen: Copenhagen Business School Press.
Dale, K. (2005) 'Building a Social Materiality: Spatial and Embodied Politics in Organizational Control', *Organization* 12: 649–78.
Deleuze, G. and Guattari, F. (1980) *Mille plateaux, Capitalisme et schisophrénie 2*. Paris: Les éditions de minuit.
Deleuze, G. and Parnet, C. (1977) *Dialogues*. Paris: Groupe Flammarion.
DeMello, M. (2012) *Animals and Society: An Introduction to Human-Animal Studies*. New York: Columbia University Press.
Despret, V. (1996) *Naissance d'une théorie éthologique. La danse du cratérope écaillé*. Paris: Les Empêcheurs de penser en rond.
Despret, V. (2004) 'The Body We Care for: Figures of Anthropo-zoo-genesis', *Body & Society* 10: 111–34.
Doré, A. (2010) 'Promenade dans les mondes vécus. Les animaux peuvent-ils être des interlocuteurs de l'enquête socio-anthropologique?' *Sociétés* 108: 33–45.
Doré, A. (2011) 'Des loups dans la Cité. Eléments d'écologie pragmatiste', PhD Dissertation, Institut d'Etudes Politiques de Paris & Université de Liège, p. 642.
Doré, A. (2013) 'L'exercice des biopolitiques. Conditions matérielles et ontologiques de la gestion gouvernementale d'une population animale', *Revue d'anthropologie des connaissances* 7: 837–55.
Engeström, Y. and Blackler, F. (2005) 'On the Life of the Object', *Organization* 12: 307–30.
Foucault, M. (1976) *Histoire de la sexualité, vol. 1: La volonté de savoir*. Paris: Éditions Gallimard.
Garfinkel, H. (1956) 'Some Sociological Concepts and Methods for Psychiatrists', *Psychiatric Research Reports* 6: 181–95.
Gherardi, S. (2009) 'Practice? It's a Matter of Taste!', *Management Learning* 40: 535–50.
Gioia, D. A. and Poole, P. P. (1984) 'Scripts in Organizational Behavior', *Academy of Management Review* 9: 449–59.
Grint, K. and Woolgar, S. (1997) *The Machine at Work: Technology, Work and Organization*. Cambridge: Polity Press.
Grusin, R. (2015) *The Nonhuman Turn*, p. 288. Minneapolis, MN: University of Minnesota Press.
Haraway, D. (1989) *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York; London: Routledge.
Haraway, D. (2005) *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago, IL: Prickly Paradigm Press.
Haraway, D. (2008) *When Species Meet*. Minneapolis, MN: University of Minnesota Press.

Houdart, S. and Thiery, O. (2011) *Humains, non-humains: Comment repeupler les sciences sociales*, p. 368. Paris: La Découverte.
Katcher, A. H. and Beck, A. M. (1983) *New Perspectives in Our Lives with Companion Animals*, p. 640. Philadelphia, PA: University of Pennsylvania Press.
Kirksey, S. E. and Helmreich, S. (2010) 'The Emergence of Multispecies Ethnography', *Cultural Anthropology* 25: 545–76.
Lagneaux, S. and Servais, O. (2014) 'De la traite robotisée au raid d'avatars. Incorporation et virtualisation', *Parcours anthropologiques* 9: 73–101.
Latour, B. (1988 [1984]) *The Pasteurization of France*. Cambridge, MA: Harvard University Press.
Latour, B. (1993 [1991]) *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.
Latour, B. (1996) 'On Interobjectivity', *Mind, Culture, and Activity* 3: 228–45.
Latour, B. (2013 [2012]) *Enquiry Into Modes of Existence: An Anthropology of the Moderns*. Cambridge, MA: Harvard University Press.
Latour, B. (2013) '"What's the Story?" Organizing as a Mode of Existence', in D. Robichaud and F. Cooren (eds) *Organization and Organizing: Materiality, Agency, and Discourse*, 62–76. New York: Routledge.
Latour, B. and Strum, S. C. (1986) 'Human Social Origins: Oh Please, Tell Us Another Story', *Journal of Social and Biological Structures* 9: 169–87.
Law, J. (1994) *Organizing Modernity*. Oxford: Blackwell.
Lord, R. G. and Kernan, M. C. (1987) 'Scripts as Determinants of Purposeful Behavior in Organizations', *Academy of Management Review* 12: 265–77.
Lynch, M. (1988) 'Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences', *Social Studies of Science* 18: 265–89.
Michalon, J. (2014) *Panser avec les animaux. Sociologie du soin par le contact animalier*. Paris: Presses des Mines.
Michalon, J., Doré, A. and Mondémé, C. (2016) 'Une sociologie avec les animaux: Faut-il changer de sociologie pour étudier les relations humains/animaux?' *SociologieS* [Online] Special Issue: 'Sociétés en mouvement, sociologie en changement'.
Mondémé, C. (2016) *Interactions et socialité interspécifiques: une analyse des ressources multimodales dans la communication hommes/chiens*. Limoges: Éditions Lambert-Lucas.
Muniesa, F., Millo, Y. and Callon, M. (2007) 'An Introduction to Market Devices', *Sociological Review* 55: 1–12.
Orlikowski, W. J. (2007) 'Sociomaterial Practices: Exploring Technology at Work', *Organization Studies* 28: 1435–48.
Pierre, E. (1997) 'La zoophilie dans ses rapports à la philanthropie, en France, au XIXe siècle', *Cahiers d'histoire* 3–4: 655–75.
Poole, P. P., Gray, B. and Gioia, D. A. (1990) 'Organizational Script Development through Interactive Accommodation', *Group & Organization Management* 15: 212–32.
Porcher, J. (2016) 'Animal Work', in L. Kalof (ed.) *Oxford Handbook of Animal Studies*. Epub ahead of print June 2014. DOI: 10.1093/oxfordhb/9780199927142.001.0001.
Porcher, J. and Schmitt, T. (2012) 'Dairy Cows: Workers in the Shadows?' *Society & Animals* 20: 39–60.
Robichaud, D. and Cooren, F. (2013) *Organization and Organizing: Materiality, Agency, and Discourse*. New York; London: Routledge.
Schank, R. C. and Abelson, R. P. (1977) '*Scripts, Plans, Goals, and Understanding: An Inquiry into Human Knowledge Structures*'. Abingdon: Psychology Press.
Strong, P. M. and Dingwall, R. (1983) 'The Limits of Negotiation in Formal Organisations', in G. N. Gilbert and P. Abell (eds) *Accounts and Action*, pp. 98–116. Aldershot: Gower Publishing.
Strum, S. S. and Latour, B. (1987) 'Redefining the Social Link: From Baboons to Humans', *Social Science Information* 26: 783–802.
Tannen, D. (2004) 'Talking the Dog: Framing Pets as Interactional Resources in Family Discourse', *Research on Language and Social Interaction* 37: 399–420.
Taylor, N. (2013) *Humans, Animals, and Society: An Introduction to Human-Animal Studies*. New York: Lantern Books.

Vialles, N. (1994 [1987]) *Animal to Edible*. Cambridge: Cambridge University Press.
Vissac, B. (2006) *Les vaches de la République. Saisons et raisons d'un chercheur citoyen*. Paris: Editions Quae.
von Uexküll, J. (2010 [1934/1940]) *A Foray into the Worlds of Animals and Humans: With A Theory of Meaning*. Minneapolis, MN: University of Minnesota Press.
Waldau, P. (2013) *Animal Studies: An Introduction*. Oxford: Oxford University Press.
Weick, K. (1979) *The Social Psychology of Organizing*. Reading, MA: Addison-Wesley.
Weil, K. (2012) *Thinking Animals: Why Animal Studies Now?* New York: Columbia University Press.
Woolgar, S., Coopmans, C. and Neyland, D. (2009) 'Does STS Mean Business?' *Organization* 16: 5–30.

Author biographies

Antoine Doré is a researcher at the French National Institute for Agricultural Research (INRA). He holds a PhD in Sociology from Sciences Po—Paris Institute of Political Studies and a PhD in Environmental Science and Management from University of Liège (ULg). Dr Doré's research is set on the management and government of life, specifically on the agricultural and environmental sector. His main area of interest as well as academic expertise covers the area of Science and Technology Studies, Organization Studies, Sociological studies of human–animal relationships, Infrastructure Studies, Biopolitics as well as Mapping and interpreting controversies.

Jérôme Michalon is PhD in Sociology from the University of Saint Etienne (France). He has specialized in the study of human–animal relationships, sociology of science, sociology of health, and political sociology. In 2014, he published an essay about the social stakes of animal-assisted therapies (*Panser avec les animaux. Sociologie du soin avec le contact animalier*, Presses des Mines, 2014). He is currently working on the links between humans, technical objects, and natural entities.