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Securing transport/animal encounters in road spaces and airspaces
From disturbed traffic to diverted animals

Pierre Lannoy
Assistant Professor
Centre METICES – Institut de Sociologie
Université Libre de Bruxelles (Belgium)

This paper discusses the various approaches taken to encounters between motorised transport and animals throughout the 20th century. It focuses more on two transport systems: automobiles and aviation. The field under study is broad and the question is viewed from several angles: legal, geographical, technical, scientific, and, of course, institutional.

In this historical and social stretch I have attempted to identify what can be considered as watersheds in the way of seeing, thus dealing with, the problem of encounters between vehicles and animals in movement on and around transport infrastructures. This social-historic study will bring out two registers of response to the animal problem, or more precisely two modes of 'co-constitution' for humans and animals in 'driving spaces' (Merriman, 2007) and 'airspaces' (Pascoe, 2001), both being considered here as '*machine spaces*' or '*territories devoted primarily to the use of machines*' (Horvath, 1974).

We shall first see how the earliest development of automobile and air traffic was characterised by a concern for the domestic nature of the animal kingdom. In the beginning, domestic animals were components of traffic problems whereas wild animals were simply ignored.

We will then see a second phase, from the 1960s, marked by a growing relevance in the distinction between domestic animals and wild fauna which altered the concerns that managers and users of traffic had regarding animals. I will then discuss various approaches to the problem of encounters between 'wild animals' and humans in road or air traffic.

Clearing of fields and ways

Although the pioneer image generally associated with the first pilots and motorists might lead us to think they were primarily faced with a world full of wild animals surprised by these newfangled interlopers, we will see that the story was actually quite different. It was the domestic register that shaped the first relations between animals and motor traffic, both cars and planes.

On the roads

Let's first look at the automobile. What animals did the earliest drivers come up against? Horses, dogs and cats, in both the city and the countryside. And in rural areas cattle and poultry. In short, domestic

animals. The problem for both drivers and animal owners was their incompatible uses of the roadway, giving rise to fearful near-misses, slowdowns, collisions and accidents.

The scenario is well known for it has been widely studied by automobile historians (Fridenson, 1991; Studeny, 1995; Bertho-Lavenir, 1999; Flonneau, 2008; Moran, 2009; Orselli, 2011). It is worth mentioning, however, how encounters between automobiles and animals were made safer in France. A *modus vivendi* gradually reached during the first decades of the 1900s was based on two elements.

To begin with on behalf automobiles there was a large campaign to rein in the behaviour of animals and their owners. Those who used roads before the age of motoring found themselves obliged to become more disciplined in the way they occupied (and also kept off) these areas and exercise greater self-control. This dual constraint involved keeping the roads free for the automobiles by keeping to one's place (at home, in the yard, meadows, on pavements,...) and controlling both human and animal behaviour to avoid accidents. Although calls to keep the road free (restrictions on road grazing and enclosure rules) obviously predated the automobile, in earlier times they were frequently ignored.

In an 1856 directive addressed to the mayors of the rural townships in the Seine Department, the prefect Haussmann reminded them that '*on the sideroads and pavements it is expressly forbidden to lead or leave horses, mules, donkeys, cattle or other animals to wander alone or in herds; it is also forbidden to attach horses and other animals to trees'* (Orselli, 2011:171).[1]

Later, in 1902, a report to the prefect of Indre-et-Loire denounced the '*continual infraction'* of '*renting a strip of field at the edge of the road so livestock can travel back and forth to the stables, damaging the roadside vegetation'* (Orselli, 2011 :171-2). Or, yet again:

'*In June 1913, a bailiff mandated by the Armorican Automobile Club noted, along a 60km circuit from Lorient to Auray and back, no fewer than 56 major violations including numerous cows and horses wandering along the road, convoys of 5 coaches with a single driver, several animal-drawn vehicles or handcarts travelling along the left and failing to move to the right. The bailiff did not even count the dogs and poultry, all prohibited on the roads but less dangerous for motorists!'* (Orselli, 2011 :172).

This form of road occupation apparently undermined road traffic safety: such 'encounters' between motorists and animals were serious problems, especially in the minds of the spokesmen for automobile groups and the State.

Successive traffic codes reiterated this will to keep the roads free. Here is the wording in articles 56-58 of the traffic code adopted in 1922 (entirely repeated in the renewed regulation of 1948):

> *'Article 56. Herds. - Groups or herds of any animal species on public roadways must be led in such a way that it does not block public traffic and that the animals can be crossed or passed in satisfactory conditions. Animal herds must not stop on the road.*
>
> *'Article 57. Letting run or abandoning animals on the public roadway. - Notwithstanding the provisions of the Criminal Code concerning harmful or ferocious animals, it is prohibited to let any animal whatsoever stray onto public roads and to leave draft, pack or saddle animals unattended.*

[1] Quotations from French sources in this paper are the author's own translation.

Article 58. Grazing - It is prohibited to send or allow animals of any species to graze on public roads, with the exception of rural roads and byways not used by general traffic that have been notified to the public through a prefect order. These animals must be attached.'

We can find the same principles in Belgian law, which stipulates the following for cities:

'Art. 47. - The following must always be driven at a walking gait in urban areas:
1° Vehicles with no shock absorbers;
2° Handcarts
3° Dogcarts
4° Animals.

Art. 48. - In urban areas it is prohibited to allow draft or mounted animals to gallop, unless they are on ways specially reserved for this purpose.' [2]

In 1926 an American motorist who was also an ornithologist noted, as he travelled along the roads in Iowa, that birds could also be traffic victims: *'Wildlife seems to be more fortunate in this matter than the farmer's chickens. […] the farmer […] seems to think it is less expensive to have a few fowls killed by cars than to fence them in'* [3]. Another observer nonetheless mentions that poultry owners in Illinois appear to be more disciplined: *'The small numbers of chickens killed was rather surprising and it is probable that a greater effort is being made to keep them off the highways'* (Flint, 1926: 427)[4]. As in Europe, chickens and farmers had to learn a new definition of domestic: that which stops at the edge of the road, now become deadly.

Secondly and contrary to what one might expect, non-motorists were not alone in changing their road habits; it was not a unilateral phenomenon. Motorists were also called on to rein in their driving tactics. On the one hand, automobile proponents urged novices to drive prudently, slow down in towns and villages, and signal their approach by klaxonning. This taming of motorist behaviour became official with the first motor traffic codes and continues to our day.

'Art. 69. - Users and in particular the drivers of motor vehicles, liable to startle draught, burden and riding animals and livestock, are required to slow down, move to the side or halt.' [5]

A motorists' guide published in Belgium in 1949 clarifies article 57 of the French code, which was quoted above:

'This article [...] means that the road is not a doghouse or henhouse. In the case of an accident involving a dog or chicken on the road, the driver is not responsible; on condition, obviously, that he did all he could to avoid it! Certainly any driver who interpreted this article literally and knowingly committed a series of small murders on the pretext that he

[2] *Règlement général sur la police du roulage et de la circulation*, Arrêté royal du 1er février 1934, Chapitre 1, Section IX « Vitesse » (General regulations on traffic policing, Royal order of 1 February 1934, Chapter 1, Section IX: Speed).
[3] Dill, Homer R., Is the Automobile Exterminating the Woodpecker?, *Science*, Vol. 63, No. 1620 (Jan. 15, 1926), p.70.
[4] Flint, W.P., The Automobile and Wild Life, *Science*, Vol. 63, No. 1634 (Apr. 23, 1926), p.427.
[5] *Règlement général sur la police du roulage et de la circulation*, Arrêté royal du 1er février 1934, Chapitre 1, Section XV « Frayeur des animaux » (*Ibid*., Section XV: Frightening animals).

would not have to answer to them, would first be guilty of crude and callous behaviour and, often, could be charged with speeding in an agglomeration.'[6]

Although dogs and chickens are ordered back into their domestic space, motorists also must tame their sadistic and arrogant penchants, under pain of being called to order.

On another front, on behalf of rural populations, the mayors and prefects exerted pressure to establish various categories of roads, primarily in the aim to keep their power to authorise road uses not always compatible with laws catering to cars. The main uses were related to movement and grazing of herds. For example, in a circular of 15 February 1923, the Interior and Public Works Ministers informed the prefects of certain measures that loosened the Traffic Code adopted on 27 May 1921:

> 'Revised with the collaboration of qualified representatives of various categories of road users, this decree which largely takes into account the complaints received from rural populations, must be considered as establishing the freely accepted charter of the rights and duties of all those who, for any purpose, use the thoroughfares open for public traffic. [...] You are asked to determine, through two separate regulations, the country roads and byways and the sections of these local public ways that are not used by general traffic, where *the movement of unlit agricultural vehicles after dark* and *grazing of animals on a handheld leash* can be authorised, in virtue of articles 4 and 58 […] The new regulation also makes it your responsibility (article 56) to establish, if relevant, for your department, the conditions and itineraries for the gathering and seasonal movement of *herds in transhumance.*'[7]

On behalf of these domestic animals concessions were made to 'rural usages' even if still today they are occasionally seen as the expression of a chronic traditionalism (Orselli, 2011:158).

We can thus see that before the Second World War the root of the problem was domestic animals. It was their encounters with road traffic that needed to be made safer. This was accomplished by transforming the domestic modes of animals and their owners, by training and restraining them (to certain sections of the road, or completely off the road). But the process also involved domesticating other road users: children, pedestrians and motorists who had to learn not to act 'stupidly' or behave like wild or raging animals. A new form of animal domesticity was invented: more control for all road users, especially aiming to decrease non-vehicle presence. With the massive development of automobile traffic and the road network, encounters with domestic animals, other than the eternal 'dog run over', progressively became exceptional situation or examples of 'local colour'.

From fields to airfields

Even if some utopists envisioned airports located at the heart of the city (Roseau, 2007), early aviators chose to settle outside the cities in open areas where they could not only fly but also store equipment.

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[6] Navez, André, *Guide de l'automobiliste comprenant le code de la route commenté et expliqué à la lumière des derniers jugements et arrêtés*, Bruxelles, Publigetext, 1949, p.150.

[7] *Circulez ! Code de la route. Texte officiel illustré de cinquante dessins humoristiques de Pecquériaux avec une pré-farce en 4 actes de Cami*, Paris, Denoël et Steele, 1930, p.114. The italics are in the original text.

The countryside held the advantage of flat, unencumbered stretches of fields, infrastructures suitable for the first airplanes. This land, however, was often used for crops or grazing, and occupied by draught animals and livestock. Rural areas were the epitome of territories that were domesticated, kept up and worked. The people and animals living in the countryside were thus simultaneously the providers, spectators and impediments to the development of aviation.

They were providers in the sense that the rural setting offered precisely those conditions that made aviation possible: the nature of land ownership, absence of physical obstacles (sparse constructions, arable land or pastures), unobstructed view, and so on. The chronicles of aviation's early years include illustrating anecdotes about: the farmer who offered Louis Blériot a field as a runway and his barn to shelter the aircraft; the Viry aerodrome in Haute Savoie which started out as 'farmland which the *châtelain* shared with a small number of pilots' [8] ; the British air force which systematically installed its first 'air stations' in the countryside amidst the fields and meadows, and the Dutch Schiphol airport which was developed on land previously reclaimed from the sea and used for farming. And lastly, we have the story of Madame Duparchy, an aristocrat of Juvisy just outside Paris, who owned the grounds of the Château de Savigny. In 1908 she threw the tenant farmers off her land so she could rent it to rich amateur aviators. She also obliged the township to hand over the grassy roads adjoining the fields where the local residents traditionally grazed their livestock (Buisson, 2009). In a Marxist sense of the word, these portions of land became ‘machine spaces’ trough a process of ‘alienation’, their former uses and users were removed in order to make possible the handling of flying machines (Horvath, 1974:181).

But those in the country also participated as spectators and witnesses enchanted by air traffic: a striking example is a series of postcards with a photomontage relating Henry Farman's first flight from Chalons to Reims on 30 October 1908. [9] The cards intend to illustrate the serenity with which the local people and animals discovered this new contraption. Some of their captions say:

Caption 1: 'History of aviation. The first flight. On 30 October 1908 Henry Farman left the Bouy airfield and flew from the Camp de Chalons to Reins. A farmer labourer in the Sillery plains noticed the flight.'

Caption 2: 'The first flight. On 30 October 1908 the aviator Henry Farman flew from the Camp de Chalons to Reins (27 km) in 17 minutes, with an average speed of 95 km/hour. In the Sillery plain a young shepherd, surprised by the unusual sound of the motor, looks over his shoulder and spots the biplane.'

Caption 3: 'History of aviation. The first flight. On 30 October 1908 Henry Farman left the Bouy airfield and flew from the Camp de Chalons to Reims, for the first time overcoming natural barriers, which aviators will meet again in the future. A horse is frightened by the noise of the motor.'

And aviation was indeed fascinating: crowds of spectators visited the airfields, to the point that it gradually proved necessary to 'tame' this enthusiastic curiosity, for example by erecting fences to separate them, not so much from the runway but from the section of the field where the planes flew. Along similar lines, the British military authorities stressed an additional advantage the countryside

[8] From the site of aeronautics pioneers in Geneva - www.pionnair-ge.com/spip1/spip.php?article169.

[9] This series was proudly reproduced on a site called *Champagner, cradle of world aviation*, developed by 'Les Grandes Marques et Maisons de Champagne' http://aviation.maisons-champagne.com/dir.php?centre=02-histoire&menu=02 .

held for aviation: their fields were far from the cities, and also from crowds of curious citizens who proved to be too invasive (Clarke, 2008).

The rural inhabitants, though, also showed signs of discontent or ill-adaptation to air traffic. This was notably the case for the Schiphol Airport in the Netherlands: its chroniclers recall a time when angry farmers threw vegetables at passengers crossing the airfield (Dierikx, 1999; Cresswell, 2006). Some animals also expressed their opposition, as told in two anecdotes. A birdwatcher relates that in 1919 his farmer grandfather on several occasions saw a kingbird attack a biplane flying low over a field. He noted that '*the courage and audacity of this bird in attacking a noisy and relatively huge airplane was certainly extraordinary*' [10]. Then there was Tom, a dog belonging to a farm boy who attended Louis Blériot's maiden flight on 25 July 1909. The animal became so excited by the noise of the airplane and the crowd around it that he jumped, teeth barred, at the whirling propeller and was mortally wounded. [11]

In short, the countryside, a domesticated territory, was a space well adapted to the earliest phases of aviation. The animals, also domesticated, do not pose any real problem. Quite the contrary. Animals, albeit involuntarily, gave rural or periurban space its cleared nature. It was only later, from the 1940s but especially in the 1950s-1960s, that airports were radically transformed into specialized, 'artificial' (lighting, concrete, detection apparatus, etc.) and secured spaces, separated from the surrounding territory - an area where domestic animals were excluded, except when they became passengers themselves.[12]

The animal cause: inventing wildlife

In the 1960s a new feature appeared in the relationship between animals and road or air traffic. The problem gradually formulated had nothing to do with (insufficiently) domesticated animals. This time it was the wild nature of some creatures that mobilised the managers and users of traffic infrastructures.

Blame it on the wildlife

The decades of the 1960s and 1970s invented the 'animal cause' by placing wild animals at the heart of transport problems. They were either accused of causing a number of dangers and accidents which the infrastructure managers henceforth had to prevent, or they were the objects of political action by defenders of nature who started to plead and fight to preserve flora and fauna and to denounce what will be later labelled as 'roadkill', a recent catchword for the recurring acknowledgment that machine

[10] Williams, John R. (1935), Kingbird (Tyrannus tyrannus) Attacks Airplane, *The Auk*, 52/1, p.89.

[11] Histoblériot, 'The first victim of Blériot XI', 29 February 2012 (source : http://www.papybleriot.fr/archives/2012/02/29/23641550.html).

[12] See e.g. Coppens (2011:65), showing a picture of a '*cargo of calves, shipped from Brussels to the Congo on a DC-6'* in the 1950s.

spaces are also ‘places of death’ (Horvath, 1974:181), not only for humans, but also for animals. Through lack of space I will only discuss the first facet of the phenomenon.[13]

Without wishing to exaggerate, we might suggest that, for France, the 'animal cause', designating animals as a factor in road safety, was born in 1963. This is the year, in fact, when Sign A15b ('wild animal passage', represented by a deer) entered into the Traffic Code (Duhamel, 1994).[14] So wild animals were first recognised by traffic institutions in a semiological form.[15] They continued wending their way through technical arrangements, legal texts, academic specialisations and actions by ecologists.[16]

But 1963 was also the year when the first 'Symposium on the problem of birds and airports' was organized, in the French town of Nice, from 25 to 27 November 1963.[17]

This symposium was a true innovation, something we may find hard to measure at our 50 year distance. To begin with, it was the first gathering in history on this subject, on the idea that bird populations were a hindrance and threat for air traffic. Several texts published on the subject after this date affirmed that birds had always been a problem for aviators, and as proof of this long history of dangerous relations almost ritually referred to a 1912 accident in which the American pilot Calbraith Rogers lost his life when his plane collided with a bird. As a modern specialist states:

> '*Despite this tragic event, strikes with birds and other wildlife were of little concern for the first 50 years of aviation.*' (Dolbeer, 2013:1)

He also points out:

> '*In fact, only three civil aircraft were destroyed and two human fatalities were documented worldwide between 1912 and 1959.*' (Dolbeer, 2013:1)

In other words, the literature on the subject reveals no trace of a proven 'bird problem' before the 1960s. Quite the contrary, as the following anecdote suggests: In 1951, the Belgian airport of Haren allowed pigeon fanciers to launch their pigeons at the end of the runways (Van Humbeek, 2002:134). If there ever were a 'problem of birds at airports' it was invented in the early 1960s.

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[13] The phenomenon of ‘roadkill’ (a term coined for the first time in the 1990s) has already been studied by cultural historians (Moran, 2009; Sterba, 2012), philosophers (Smith, 2009; Kuha, 2011) or sociologists (Mikael, 2004).

[14] *Arrêté du 22 octobre 1963 sur la signalisation routière* [Order of 22 October 1963 on road signs] (J.O. 28/12/63). The motives for this innovative signalling remain to be elucidated... Belgium adopted the same sign ('large animal crossing') in 1968 (Royal order of 16 March 1968). At the international level, the sign was standardised under the code A14b in the Vienna Convention on Road Signs and Signals of 8 November 1968.

[15] As early as the 1920s, animals had already appeared on the road - posthumously - as innocent victims and fauna indicators, in the chronicles of American and German ornithologists and naturalists. R.M. Knutson's book *Flattened Fauna*, published in 1987, is a contemporary extension of this particular taxonomic attention. Also worth mentioning is Johannes Erritzoe's website: *Bird Traffic casualties and road quality for breeding birds. A summary of existing papers with a bibliography*, which also provides an interesting compilation of publications from the field of ornithology (http://www.birdresearch.dk/unilang/traffic/trafik.htm).

[16] For more details on this evolution, see e.g. Bobbé (1999), Forman (2003), Rabin & Gwiazdzinski (2007), Bonnin (2008), Carsignol (2006, 2012), Luginbühl (2013), Vandevelde (2013).

[17] Busnel, René-Guy, Giban, Jacques, *Le problème des oiseaux sur les aérodromes. Compte rendu des réunions tenues à Nice les 25, 26 et 27 novembre 1963*, Paris, Institut National de la Recherche Agronomique, 1965.

But this was not the only innovation: the Nice symposium also inaugurated a new alliance between professions and ushered in a significant process of institutionalisation. On the one hand, the conference participants represented a broad range of professions: airport managers, representatives of national air forces, scientists (ornithologists and biologists), public officials. Furthermore, the symposium was international, most likely linked to the geographical-institutional specificity of aeronautics. [18] The agenda dealt with three main themes: counting/registering the incidents, knowledge of bird species and behaviour, and the development of techniques to manage the problem of birds in and around airports, both military and civil: techniques to follow bird movements (radars, migratory maps, etc), acoustic and visual methods to frighten them away, infrastructure arrangements, and so on. No lack of innovations! In both its composition and contents, the Nice symposium installed a formula that continues even today.

On the other hand, this symposium led to other bodies devoted exclusively to the question of birds. Thus, one of the 'unanimous recommendations' expressed by the participants at the close of the meeting was to create national committees on this matter. This recommendation received thorough follow-up, internationally as well:

> *'Some pioneers in 1963 arranged a symposium in Nice for discussions and lectures concerning this new section of air safety work. The results of the symposium were promising so three years later it was decided to begin a continuous, international activity which took form of the establishment of an organization called Bird Strike Committee Europe.'* [19]

The Bird Strike Committee Europe (BSCE) met for the first time in Frankfurt in July 1966, where it decided to continue this new organisation, primarily in the form of annual meetings, information exchange and publications for authorities and specialists. The European initiative was followed in 1969 by the first worldwide conference in Kingston, Ontario (*World Conference on Bird Hazards to Aircraft*). A few years later the BSCE became the IBSC (*International Bird Strike Committee*), an organisation equally dynamic which continues its activities still today.

So we can see that birds do not just cause accidents, they also cause innovation! The problem they posed for aviation took shape, an institutional, technological and scientific shape. However, if these animals attained such power at that time it is also because aeronautics was also undergoing a transformation, and it was time to think of new methods to ensure safety.

In the 1960s turboprop aircraft first appeared in civil aviation. These engines offered more power and velocity compared to their predecessors, yet the design of these new motors made them more vulnerable to bird strikes than propellers (Solman, 1973). Turboprops were also more expensive and difficult to repair. Moreover, concerns about the risk of accidents were also more compelling in view of the growing number of planes in the air and the passengers they carried. The problem (or nuisance

[18] The problem of 'bird strikes' apparently was raised already in 1960 at the ICAO (International Civil Aviation Organization), although the initiative to organize the Nice symposium came from the French Ministry of Agriculture (322). On the subject of the institutional geography of civil aviation, see Beyer (2008).

[19] Turesson, Lars-Olof, 'Code of Practice of BSCE', *Proceedings of the 15th BSCE Conference*, BSCE 15/WP 20, Brussels, 1981, p.2.

index) of birds thus rose proportionally alongside the growth of air travel. The vast media coverage of the accident of US Airways flight 1549 over New York on 15 January 2009 is a perfect illustration. [20]

Furthermore, use of these new engines entailed changes in the landing zones: runways had to be stabilized and tarmac came into general use. The runways also had to be stretched and multiplied to ensure fluid and safe air traffic, in constant growth. In view of the speed of aircrafts and the intensity of air traffic and ground operations, access to the runways and aprons by travellers and spectators was restricted to gradually become prohibited. And the public were pushed farther from traffic areas. This spatial extension of the airport, in the form of large spaces empty of all non-machine presence, was a haven for various wild animal species, offering food (whether natural vegetation or water or artificial, like the cables that rabbits loved to nibble) and tranquillity as well. Although air traffic can be a nuisance or danger for animals, they adapt quite quickly, and an airfield has much fewer humans milling about than other stretches of land. In other words, jet technology requires a space whose qualities correspond to habitats viable for species that are dangerous for aircraft.

From the 1960s, as we have seen, there was a will to turn the treatment of animal presence near airports into a science. The 1963 Nice symposium was one of the first major events, and can be seen as the start of the process. Today, what is now known as the '*animal peril*' is the object of scientific and professionalised management, at the crossroads of biology, ethology, engineering and law: expertise in animal prevention is found in training centres, scientific manuals, specialised crews and private firms (Pillet & Seillan, 2010). Airplanes transformed by the turboprop, airfields transformed by tarmac, animals transformed by preventive measures. As Haraway (2010:110) writes: '*it is indeed an ontological choreography, a vital game invented by the participants […]. They invent this game and are transformed by it.*' Wildlife has never been as present in the world of aviation as it is now.

A 'New Middle Ages' on Airfields?

The 1960s and 1970s provided road and air transport with a new protagonist: wildlife. Managing animal/traffic encounters is clearly marked by a modern-day will to be 'scientific' as shown in the sector's publications (see e.g. Conover, 2002; Pillet & Seillan, 2010; De Vault et al., 2013; Luginbühl, 2013). Yet, surprisingly enough, the control efforts have also mobilised another type of expertise - age-old wisdom about wildlife: falconry, wolfhunting and beekeeping. Their passage through the airport space, however, has radically transformed their components - and their continuity is just as superficial as that of domestic or wild animals.

The earliest publications on the question of hazards caused by birds in airports, already report experiences involving falconry. At the 1963 Nice symposium two Canadian speakers reminded participants that '*the use of Falcons to frighten birds was tried in Great Britain during the Second World War*' [21]. They continued, explaining that '*We hired an experienced falconer who came to train four*

[20] A collision between Canadian geese and an Airbus A320 forced the plane to ditch in the Hudson River. Not one life was lost, however, thanks to the pilot's skilful water landing. The incident was reported extensively throughout the world and several works were later published on the subject (e.g. Prochnau & Parker, 2009; Langewiesche, 2010).

[21] Munro, D.A., Harris, R.D., Du danger que constituent les oiseaux près des aérodromes du Canada, *in* Busnel, René-Guy, Giban, Jacques, *Le problème des oiseaux sur les aérodromes*, op. cit., p.179.

peregrine falcons to attack glaucous-winged gulls'. Although it was still too early to judge the results of this experiment, they nonetheless explained that they '*intended to pursue this work*' and to '*try to train the falcon species*'.

In other words, falconry has been literally reinvented. Indeed, although it was an ancient art that was first mobilised, it has also been the object of a series of transformations linked to its specific used in airports:

- Falconer services have become contractualised, which raises the question of salaries and has led to the use of temporary services;
- Birds of prey (or raptors) must be trained to attack the species that frequent airports, species that are not their 'natural' prey, as a result the raptors have become specialised;
- The bird of prey is a 'specialist' so its use in an airport also requires a human staff of ('trained and dedicated operators') and technical equipment (cages and 'radio-equipped vehicles'), without which the falcon cannot work efficiently: it has become obvious that '*both the falconers and the falcons are to be well trained*' [22] ;
- Some species of raptors are covered by legal protection measures, which condition their use or even simply prohibit keeping them in captivity. This limits the availability of birds, and means that their use cannot become a '*standard method for all airports*' (Blokpoel, 1976:121) ;
- As a result, in order to maintain a sufficient number of raptors, attempts have been made at breeding in captivity, in particular by resorting to artificial insemination (Blokpoel, 1976:121).

The famous Spanish naturalist Felix Rodriguez de la Fuente said that falconry as both a 'medieval art and a modern technique', referring especially to its use in airports, a service he performed on several occasions. He discussed his experiences not only in the second edition of his work, *El arte de cetrería*, published in 1970 but also when he spoke to a BSCE meeting in 1971 in Copenhagen. For Fuente, the term 'modern' denoted new uses for this ancient art of falconry. However, it was not only the uses that were transformed but the whole set of elements involved in inventing a highly particular form of falconry - airport falconry. This not only calls for efficient birds of prey, but with adjusted hunting skills, salary costs, restrictive legislation, artificially attributed genes, and so on. The aviation stakeholders have invented a new animal species, the 'airport raptor', with quite hybrid characteristics.

In France, another medieval art was updated in airport zones, this time not to control birds but mammals. The ancient art of *louveterie*, of wolfhunting, was first established under Charlemagne to organise hunts to eliminate wolves that endangered the villages. The public authorities mandated these hunters to regulate the relations between wild animals (historically symbolised by the wolf) and humans. Aviation heralded a true reinvention of this institution, forgotten along with the *Ancien Régime*. While in 1907 a legal work on hunting and destruction of dangerous animals considered that 'louveterie *per se must disappear*' and that it was an '*institution that had caused its own demise*' [23], a brochure edited a short century later, in 2010, by the technical service of the General Directorate for Civil Aviation (reporting to the Ministry of Ecology, Energy, Sustainable Development and the Sea) justifies its return:

[22] Rodriguez de la Fuente, F. (1971), Falconry for the Control of Birds Dangerous in the Airports. Results of Three Years Practice, *Proceedings of the 6th BSCE Conference*, IBSC 06/WP 5, Copenhagen, 1971, p.4.
[23] Soudée, Gabriel, *Chasse et destruction des animaux malfaisants et nuisibles*, Paris, Berger-Levrault, 1907, p.91.

> 'Louveterie *was an institution created by Charlemagne in 813 to organise the destruction of wolves and protect the inhabitants and their livestock against predators. The wolfhunter was the first agent of the Crown. After two short disappearances, under Charles VI from 1395 to 1405 and again during the 1789 French Revolution under a regulation of 9 August 1787,* louveterie *was finally abolished for economic reasons, despite all the services rendered by the hunters over the centuries. Through a quirk of History, however, the Wolfhunter Officers Corps still exists, and the need to again place* louveterie *at the service of the citizens imposes on the State the need to restore this service.'* [24]

The environmental code, adopted in 2000, specifies that the Wolfhunting officers are '*technical advisors for the administration in the destruction of harmful animals*' (art. R427-1). They are also the ones who actually kill the animals, especially on airfields. Recalling Max Weber's analysis (1995:97-99), we could thus say that the State attributes itself the monopoly of legitimate physical violence not only on humans but on animals as well.[25] We should also add an extra element to this analysis: the fact that animals considered as harmful for aviation activities can be targeted for hunting down or 'destruction' does not arise from their supposedly wild nature but quite the opposite, from their intrinsically administrative nature. The hunting parties organised by the French airports only allow administratively defined entities to participate, and only authorise acts defined administratively. Those involved (prefects, departmental offices for agriculture and forests, agents of air navigation, safety, and airport gendarmerie services, wolfhunting corps officers, etc.) all participate as administrative agents, the weapons must comply with the regulations and their actual use on the airfields follow a series of precise instructions (flanking not grazing shot, night shooting with flares), the number of animals to be 'destroyed' is determined ahead of time and afterwards they are subject to minute administrative traceability and accounting processes. The areas in which these 'administrative hunts' take place (airports) are themselves governed by special regulations, established by a State authority. And lastly, especially, the animals concerned hold precise legal status (species 'subject to quotas' and not 'protected' species, etc.) and it is solely in virtue of these properties that they can be targeted, in both the administrative and hunting sense of the term.

As we can see, although wolfhunting owes its substantially official State character to its medieval origins, the concrete form of its practice in aviation zones presupposes a series of special adjustments that make this practice a composite accomplishment, bringing to life - all the better to destroy it - a carefully constructed wildlife.

Another traditional craft undertaken in some airports (Düsseldorf, Lyon, Malmö, Chicago, among others) is beekeeping, in the aim to bring more safety to the relations between airport activity and its

[24] Briot, J.L., Besse, L., *Régulations des populations animales sur les aéroports. Guide technique*, Toulouse, Service Technique de l'Aviation Civile, 2010, p.6.

[25] The legitimacy of this institutionalised 'destruction' has been nonetheless denounced by some animal defence associations. For example, see the position of *Rassemblement pour l'Abolition de la Chasse* (Grouping to Abolish Hunting) which considers wolfhunting an 'aberrant practice'. (www.abolition-chasse.org/aberrant_lieutenant_louveterie.htm).

natural environment. Like the falconer's bird of prey, the bee is a wild animal that is used and transformed to enable the infrastructure managers to control a number of risks.

Thus, in June 2010 the firm 'Aéroports de Paris' (which 'manages, equips and runs' the airports at Orly, Roissy and Bourget) announced that they were installing six beehives at Charles-de-Gaulle 'in the aim to intensify monitoring of air quality at the airport'[26]. A professional beekeeper, working on behalf of the UNAF (National Union for French Beekeeping), is in charge of the insects and their production. As in the case of falconry and wolfhunting, the work is entrusted to duly mandated craftsmen. The airport managers are interested in bees because these insects serve as independent agents to analyse the quality of the site's immediate environment. Their independence (quite simply in their capacity as 'wild' animals) is nevertheless mediated by the work of a laboratory that analyses their 'natural' production, in other words honey, since the quality of the nectar is not immediately detectable:

> *'[The bees] will be monitored throughout the year by a UNAF beekeeper. With an average of 40 flights per day, per bee, each visiting about 700 flowers, the bee is in contact with the air, soil, vegetation and water. The honey collected will be analysed by an independent laboratory to ascertain its taste quality and detect any possible pollutants*.'[27]

Unpaid and by their very 'nature' busy, the bees drafted for this job will help reassure the airport authorities, and especially their detractors, about the state of the environment affected by aviation. In fact, the true relation these insects are charged to secure is primarily that between the airport and groups which, in a more or less structured but always incisive manner, denounce the environmental damage caused by airports. The bees were thus hired for two jobs, as ecological testers ('the bee as a bio-indicator'[28]) and agents in environmental marketing.

> '*When it was analysed by an independent body, the honey produced in Roissy showed no trace of lead, nitric oxide nor pesticides. A few slight traces of zinc can be explained by the fact that the bees drink water from the roadside drain pipes. With any doubt about its purity erased, the honey also serves as a witness of the airport's biodiversity, the analysis revealed essences of hawthorn (25%), Brassicaceae (25%) as well as other species (willow, honeysuckle, maple, alder buckthorn, etc.). And lastly, the honey is packed as a promotional gift in small pots marked 'Miel de l'aéroport Paris Charles-de-Gaulle', which the Ministry of the Environment has distributed to local residents and the airport director, Franck Goldanel, offers to VIP visitors.'* (Azouvi, 2012:223).

Partners and recipients of the activity of the bees at the airport, nevertheless appear to see different objectives for this operation. As signers of the charter 'The bee, sentinel of the environment', the UNAF is first and foremost concerned about the 'importance of preserving this pollinating fauna to safeguard our crops and biodiversity' and, in this context, they seek to recruit institutional partners, both public and private, who can promote the situation of bees as a 'national cause'. The fact that bees can also serve as indicators for the quality around airports is likely of only marginal interest. This aspect is not

[26] Aéroports de Paris, « Développement durable. Aéroports de Paris signe la charte « L'Abeille, sentinelle de l'environnement » de l'Union Nationale de l'Apiculture Française », ('Sustainable Development. The Airports of Paris sign the UNAP charter 'The Bee a sentinel for the environment'), Press release, 18 June 2010.
[27] Ibid.
[28] Ibid.

even mentioned on UNAF's web page devoted to Roissy. As for the residents living near the airport, the production of high quality honey does not seem to qualm their attempts at criticism.[29]

Without delving deeper at this time, we can already highlight some common areas between these three airport safety practices:

- They are age-old arts, mainly crafts that mobilise the skills of an initiated group and rely on a special and close relationship with a wildlife species.
- They employ practitioners mandated by the airport authorities and, indirectly, by the State.
- The aim to bring more safety to the relations between air traffic and animal activity, either directly or indirectly (as indicator of an environment that is safe in terms of ecology and health).
- Their deployment redefines both the qualities of the animal species and the networks of components required by humans to control them.

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This paper has tried to illustrate two ideas. The first is that the problem of wild animals on roads and airfields is an invention that can be situated historically, occurring much later than solutions proposed for domestic animals. The wildlife question was constituted in the context of the massification of road and air traffic. The second idea is that animals assume their domestic or wild nature through multiple processes to transform spaces, rights, knowledge and institutions (Bobbé, 1999). This is done in the aim to render operational measures by which these same animals, in their own habitats and habits, can adapt to these changes and avoid the dangerous encounter with motorised traffic. An animal's 'wild' or 'natural' mode of existence is thus far from being *sui generis*: quite the contrary, its texture is an ontologically composite tissue which is continually reformulated in the laboratory we call Society.

[29] For example the article « Le miel de Roissy n'adoucit pas les riverains » (Honey from Roissy does not sweeten the local residents') published 3 December 2008 in the *Le Parisien*. In particular it discusses the remarks by the Chair of the residents' association (source: www.leparisien.fr/seine-saint-denis-93/le-miel-de-roissy-n-adoucit-pas-les-riverains-03-12-2008-329848.php).

References

Azouvi, Cyril (2012), *Roissy, un monde secret. Enquête dans les coulisses du plus grand aéroport d'Europe* (Paris: Denoël).

Bailly, Jean-Christophe (2007), *Le versant animal* (Paris: Bayard).

Beyer, Antoine (2008), Les frontières du « ciel unique européen ». Enjeux techniques et territoriaux du contrôle aérien en Europe, *Flux*, 71/1, 8-23.

Bertho-Lavenir, Catherine (1999), *La roue et le stylo. Comment nous sommes devenus touristes* (Paris: Odile Jacob).

Blanc, Nathalie (2000), *Les animaux et la ville* (Paris: Odile Jacob).

Blokpoel, Hans (1976), *Bird Hazards to Aircraft* (Canada: Clarke, Irwin & Cy).

Bobbé, Sophie (1999), De l'aménagement du territoire au ménagement de la faune. Des passeurs de frontière, *Actes du colloque « Route et faune sauvage »*, Strasbourg, Conseil de l'Europe, 311-322 (http://www.iiac.cnrs.fr/CentreEdgarMorin/sites/CentreEdgarMorin/IMG/pdf/art3.pdf).

Bonnin, Marie (2008), *Les corridors écologiques. Vers un troisième temps de la conservation de la nature ?* (Paris: L'Harmattan).

Buisson, Jeannie (2009), *Des aéroplanes aux lotissements. Port-Aviation* (Paris : Ccinia Communication).

Burgat, Florence (2006), *Liberté et inquiétude de la vie animale* (Paris: Kimé).

Carsignol, Jean (2006), *Routes et passages à faune. 40 ans d'évolution* (Bagneux : Sétra, coll. 'Les rapports').

Carsignol, Jean (2012), Des passages à gibier à la Trame Verte et Bleue : 50 ans d'évolution pour atténuer la fragmentation des milieux naturels en France, *Le Naturaliste canadien*, 136/2, 76-82.

Clarke, Bob (2008), *The Archeology of Airfields* (Gloucestershire: The History Press).

Conover, Michael (2002), *Resolving Human-Wildlife Conflicts. The Science of Wildlife Damage Management* (Boca Raton: Lewis Publishers).

Coppens, Marguerite, dir. (2011), *SABENA. Le progrès venait du ciel. L'histoire du transport aérien belge* (Gent: Borgerhoff & Lamberigts).

Cresswell, Tim (2006), *On The Move. Mobility in the Modern Western World* (New York: Routledge).

DeVault, T.L., Blackwell, B.F., Belant, J.L., eds. (2013), *Wildlife in Airports Environments. Preventing Animal-Aircraft Collisions through Science-Based Management* (Baltimore: The Johns Hopkins University Press).

Dierikx, Marc (1999), *Schiphol. Amsterdam's Airport below the Sea* (Shrewsbury: Airlife).

Dolbeer, Richard A. (2013), The History of Wildlife Strikes and Management at Airports, *in* DeVault, Blackwell & Belant, 1-6.

Duhamel, Marina (1994), *Un demi-siècle de signalisation routière. Naissance et évolution du panneau de signalisation routière en France, 1894-1946* (Paris: Presses de l'Ecole Nationale des Ponts et Chaussées).

Flonneau, Mathieu (2008), *Les cultures du volant, XXe-XXIe siècles* (Paris: Autrement).

Forman, Richard T.T. [et al.] (2003), *Road Ecology: Science and Solutions* (Washington: Island Press).

Fridenson, Patrick (1991), La société française et les accidents de la route (1890-1914), *Ethnologie française*, XXI, 306-313.

Haraway, Donna J. (2008), *When Species Meet* (Minneapolis: University of Minnesota Press).

Haraway, Donna J. (2010), *Manifeste des espèces de compagnie. Chiens, humains et autres partenaires* (Paris : L'Eclat).

Horvath, Ronald J. (1974), Machine Space, *Geographical Review*, 64/2, 167-188.

Knutson, Roger M. (2006), *Flattened Fauna. A Field Guide to Common Animals of Roads, Streets, and Highways* (Berkeley: Ten Speed Press).

Kuha, Mai (2011), Degrees of Anthropocentrism in Accounts of Wildlife-Vehicle Collisions, *Society & Animals*, 19, 19-21.

Langewiesche, William (2010), *Fly By Wire. The Geese, the Glide, the 'Miracle' on the Hudson* (London: Penguin Books).
Luginbühl, Yves, dir. (2013), *Infrastructures de transports terrestres, écosystèmes et paysages* (Paris: La Documentation française).
Merriman, Peter (2007), *Driving Spaces. A Cultural-Historical Geography of England's M1 Motorway* (Malden: Blackwell).
Michael, Mike (2004), Roadkill: Between Humans, Nonhuman Animals, and Technologies, *Society & Animals*, 12(4), 277-298.
Moran, Joe (2009), *On Roads. A Hidden History* (London: Profile Books).
Orselli, Jean (2011), *Usages et usagers de la route. Requiem pour un million de morts* (Paris: L'Harmattan).
Pascoe, David (2001), *Airspaces* (London: Reaktion Books).
Pillet, Stéphane, Seillan, Hubert (2010), Prévention du péril animalier sur les aéroports, *Préventique Sécurité*, 110, 14-24.
Prochnau, William, Parker, Laura (2009), *Miracle on the Hudson* (New York: Ballantine Books).
Rabin, Gilles and Gwiazdzinski, Luc (2007), *Si la route m'était contée* (Paris, Eyrolles).
Roseau, Nathalie (2007), Les métamorphoses de l'infrastructure. New York et l'imaginaire de la ville aérienne, *in* Prelorenzo, C., Rouillard, D., dir., *Le temps des infrastructures* (Paris : L'Harmattan), 57-70.
Smith, Mick (2009), Road Kill: Remembering What is Left in our Encounters with Other Animals, in M. Smith, J. Davidson, L. Cameron, L. Bondi, (eds.), *Emotion, Place and Culture* (Farnham: Ashgate).
Solman, V.E.F. (1973), Birds and Aircraft, *Biological Conservation*, 5/2, 79-86.
Sterba, Jim (2012), *Nature Wars. The Incredible Story of How Wildlife Comebacks Turned Backyards into Battlegrounds* (New York: Crown Publishers).
Studeny, Christophe (1995), *L'invention de la vitesse. France, XVIIIe-XXe siècle* (Paris: Gallimard).
Van Humbeek, Frans (2002), *Brussels Airport. The History of Haren, Melsbroek and Zaventem* (Nieuwkerken-Waas: Het Streekboek).
Vandevelde, Jean-Christophe (2013), Les choix de tracé des grandes infrastructures de transport : quelle place pour la biodiversité ?, *Développement durable et territoires*, 4:1 [online].
Viard, Jean (2012), *Penser la nature. Tiers espace entre ville et campagne* (La Tour-d'Aigues: L'Aube).
Weber, Max (1995), *Economie et société. 1. Les catégories de la sociologie* (Paris: Pocket).
Wohl, Robert (1994), *A Passion for Wings. Aviation and the Western Imagination, 1908-1918* (New Haven and London: Yale University Press).
Wohl, Robert (2005), *The Spectacle of Flight. Aviation and the Western Imagination, 1920-1950* (New Haven and London: Yale University Press).