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Backyard birds & human-made bat houses: Domiciles of the wild in 19th & 20th century cities

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It was a cool late spring evening as I stood impatiently waiting for the bats to emerge. At sunset every day from March to November, thousands of human spectators gather in Austin, Texas, to see the largest urban bat colony in the world come out for their night hunting. But I am not standing in front of the mouth of a cave where most people think bats live. I was standing on the Ann W. Richards Congress Avenue Bridge, which crosses the Colorado river, in the downtown heart of the capital city of Texas. The bats would be emerging from their roost hanging upside down among the bridge beams. A migratory Mexican free-tail bat colony of over one million bats have come each year to the underside of this bridge since the mid-1980s to make their home and rear their young. Watching the bat colony swirl out from under the bridge and fly away into the darkening sky affirms that wildness is present in the urban.

When we think of an urban space, we probably think of its human inhabitants and the structures and infrastructures that make their lives work from roads to hospitals to city governments. Yet there are many nonhuman inhabitants of the city, from pigeons roosting on rooftops to rats in the sewers. On that day in April, looking at the swirling bats waking up to feed and streaming out from under the bridge, I got up close and personal with some wild inhabitants that co-inhabit our urban space by repurposing human buildings as their own.

In order to think about the lives of these bats and countless other species intersect with the urban space, we can focus on their homes—their *domicile*—which is found in human structures, sometimes intentional by the humans and other times not. The word *domicile* has its roots in the Latin *domus*, literally the house. This is the same root of the Latin verb form *domesticāre*, meaning to dwell in a house or become accustomed to it. The verb *domesticate* at its most simple means “to make, or settle as, a member of a household; to cause to be at home” and more specifically for animals it is “to accustom to live under the care and near the habitations of man”.¹ Although domestication when applied to animals often refers to the conscious selection and breeding of animals for specific traits so that they could be kept by humans for productive purposes, that is a limited view of domestication. Domestication is about being at home, creating a domicile.

¹ OED Online, ‘domesticate, v.’, March 2017. Oxford University Press.
<http://www.oed.com.proxy.lib.ltu.se/view/Entry/56668>

I want to propose that rather than define domestication in the biological or agricultural sciences fashion, we consider the idea of domestication as re-formulated by Science and Technology Studies (STS) and media studies fields as the processes of technology's acceptance, rejection and use.² Scholars who developed this idea of technological domestication consciously built on the idea of animal domestication, but enlarged it to encompass the "complexity of everyday life and technology's place within its dynamics, rituals, rules, routines, and patterns".³ Although domestication research began with a focus on technologies in the home, there have been calls for expanding the remit to public spaces and connections created by technologies.⁴

The domestication of technology is understood as an ongoing adaptive process in which technology is adapted to practices while at the same time people modify their behaviors and environment to integrate new technologies. In the process, technologies are objectified, i.e. located in material, cultural, and social spaces, and incorporated, i.e. temporally inserted into the patterns of life.⁵ Technologies do not come as pre-packaged wholes which are integrated into the domestic sphere, instead they are objects of negotiation. Early telephone companies, for example, had never envisioned that telephone users would make personal phone calls—they had designed it as a business communication tool.⁶ How individual households would integrate a refrigerator, a vacuum cleaner, or a car was never a given. A key observation is that the process is seldom complete—some technologies will 'disobey' attempts to domesticate it. Intellectually this approach to technological domestication is a move toward giving agency to technology's users. While designers and builders may have certain uses in mind when an object (from a small mobile phone to a large scale urban area) is created, individuals matter in how (or even if) a technology becomes part of their everyday life and practice.

In this article, I want to bring the idea of domestication full circle and apply the broader STS concept of *domestication* to an investigation of urban animals: How are urban animals domesticated in the sense of finding a place within the infrastructure of a city? How do the

² Thomas Berker, Maren Hartman, Yves Punie, and Katie Ward, 'Introduction', In *Domestication of Media and Technology*, 1-17 (Maidenhead: Open University Press, 2006), 1.

³ Berker et al., 'Introduction', 1. For examples of how technological domestication is built upon animal domestication, see Mika Panswer, 'Domestication of everyday life technology: dynamic views on the social histories of artifacts', *Design Issues* 13, no. 3 (1997): 52-65 and Roger Silverstone, 'Domesticating domestication. Reflections on the life of a concept', In Berker et al., eds., *Domestication of Media and Technology*, 229-248 (Maidenhead: Open University Press, 2006).

⁴ Silverstone, 'Domesticating domestication'; Leslie Haddon, 'Domestication analysis, objects of study, and the centrality of technologies in everyday life', *Canadian Journal of Communication* 36 (2011): 311-323.

⁵ Silverstone, 'Domesticating domestication'.

⁶ See Claude Fischer, *America Calling: A Social History of the Telephone to 1940* (Irvine: University of California Press, 1994).

animals themselves domesticate human technology in order to make their own domus? These questions grow out of some of my previous research that postulated the unclear boundaries between human artefacts and nonhuman habitats and that advocated a wider view of domestication when dealing with wild animals.⁷ In this article, I focus on the history of bird and bat inhabitants of North American cities—specifically birdhouses constructed for purple martins and bridges that became bat roosts—in order to see how urban infrastructure becomes a natural home for its wild animal inhabitants. STS scholars analyzing domestication of a technology often stress that details of a particular case are not generalizable to other technologies even if some patterns emerge.⁸ The same applies here—each animal history stands on its own and the details will not be the same in other instances. What is generalizable, however, is the involvement of domestication of human infrastructure by non-human agents.

BIRD HOUSES

Human interaction with the purple martin (*Progne subis*, known as *Hirundo purpurea* in the 19th century), the largest North American swallow, exposes how bird housing infrastructure blurs boundaries between natural and artificial through domestication. Writers of the 18th and 19th century describe structures made intentionally by humans to encourage purple martin nesting. North American settlers, as well as the native populations, had a preference for these birds because they were considered excellent at scaring away birds of prey that fed on poultry and controlled insects that were harmful to gardens and crops.

Mark Catesby described and drew the purple martin in the first major natural history treatise on the southeastern part of North America, *The Natural History of Carolina, Florida and the Bahama Islands* (1731). He included three types of details as the bird's outstanding features: (1) its coloring ("The whole Bird is a dark shining Purple; the Wings and Tail being more dusky and inclining to Brown"), (2) its migratory pattern ("They retire at the Approach of Winter, and return in the Spring to Virginia and Carolina"), and (3) its human-made housing ("They breed like Pigeons in Lockers prepared for them against Houses, and in Gourds hung on Poles for them to build in, they being of great Use about Hoses and Yards for pursuing and chasing away Crows, Hawks and other Vermin from the Poultry").⁹ Catesby's text is the earliest description of the practice of building birdhouses for the purple martin. Catesby drawing of the purple martin puts it into an agricultural context, with the bird perched on a fence near a roofed structure. The bird is displayed in a domestic setting on a fence associated

⁷ Dolly Jørgensen, 'Artifacts and habitats,' In *The Routledge Companion to the Environmental Humanities*, ed. Ursula Heise, Jon Christensen, and Michelle Niemann, 138-143 (Routledge, 2017) and Dolly Jørgensen, 'MuskoX in a box and other tales of containers as domesticating mediators in animal relocation', In *Animal Housing and Human-Animals Relations: Politics, Practices and Infrastructures*, ed. Tone Druglitrø and Kristian Bjørkdahl, 100-114 (Routledge, 2016).

⁸ Haddon, 'Domestication analysis'.

⁹ Mark Catesby, *The Natural History of Carolina, Florida and the Bahama Islands* (1731), 51

with a farm or house, although its gourd nest, which Catesby notes in the text, is not shown visually.

When John James Audubon illustrated the purple martin for his *Birds of America* (1840), he featured a gourd house prominently (Figure 1).¹⁰ He wrote about the context of the image in the accompanying text, describing the use of a hollowed calabash squash hung on a stick by the Native Americans as well as slaves in the southern states. Audubon noted that constructing wooden nesting boxes for purple martins was “a general practice, the Purple Martin being considered as a privileged pilgrim, and the harbinger of spring.”¹¹ Audubon noted that nesting boxes for purple martins were commonplace on country taverns hung up over the signboard.

According to Audubon, purple martins were not just countryside birds: ‘All our cities are furnished with houses for the reception of these birds’.¹² In fact, the purple martin may have been a more common urban resident than country one. A writer in 1908 identified purple martins as urban birds except during migration, calling them ‘haunters of civilization’ who were ‘about the business sections of our cities, where the flat gravel roofs and overhanging cornices are tenanted by these birds together with House Sparrows and Nighthawks’.¹³

In a story Audubon recounts about his own experience setting up a purple martin box, there are glimpses of the potential conflict between bird and human over the appropriation of the human-built birdhouse by the nonhuman inhabitant. Audubon had set up purple martin nests and one year decided to supplement that with several smaller boxes for bluebirds. But much to Audubon’s chagrin, ‘the Martins arrived in the spring, and imaging these smaller apartments more agreeable than their own mansion, took possessions of them, after forcing the lovely Blue-birds from their abode’.¹⁴ Audubon decided that his intent as a designer/builder of the technology had precedent—those birdhouses were for bluebirds, not purple martins—in spite of what the purple martins thought. Audubon

mounted the tree on the trunk of which the Blue-bird’s box was fastened, caught the Martin, and clipped his tail with scissors, in the hope that such mortifying punishment might prove effectual in inducing him to remove to his own tenement. No such thing; for no sooner had I launched him into the air, than he at once rushed back to the box.¹⁵

Audubon recaptured the bird and clipped its wings, but when the martin continued to occupy the bluebird house, Audubon ‘seized him in anger, and disposed of him in such a way that he

¹⁰ James J. Audubon, *Birds of America*, vol. 1 (1840), plate 45.

¹¹ Audubon, *Birds of America*, 173

¹² Audubon, *Birds of America*, 174

¹³ P. A. Taverner, ‘A purple martin roost’, *The Wilson Bulletin* 56 (1908), p. 88.

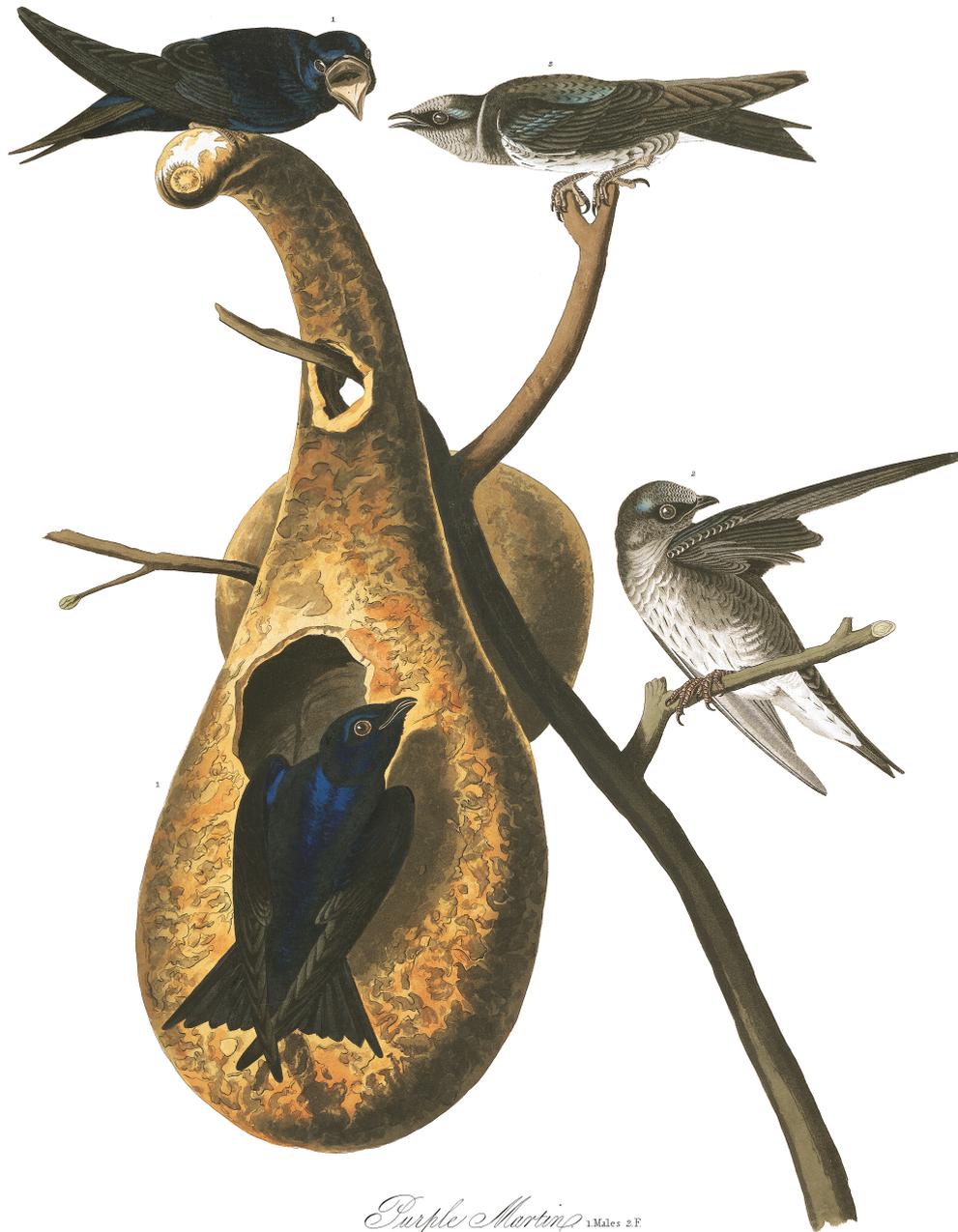
¹⁴ Audubon, *Birds of America*, 172.

¹⁵ Audubon, *Birds of America*, 172-173.

never returned to the neighbourhood'.¹⁶ This particular purple martin was attempting to domesticate a technology outside of the script defined for the object by the maker.

Nº5.

PLATE 22.



Purple Martins 1 Males 2 F

HIRUNDO PURPUREA.

Nest, a Guard.

Drawn from Nature and Published by John J. Audubon, F.R.S.E. M.W.S.

Engraved, Printed, and Coloured by R. Havell & Son, London.

Figure 1. John James Audubon, Purple Martin, *Birds of North America*, vol. 1 (1840). Image released into the public domain by the Audubon Society.

Birds are quite proficient at domesticating human structures for their own habitation. Purple martins used the urban infrastructures, both those intentionally created for them (birdhouses)

¹⁶ Audubon, *Birds of America*, 173.

and those not (roofs and cornices), as housing. The birds identified these elements created directly by human technologies as sufficient nesting sites. Enticed, but not forced, to inhabit these objects, purple martins entered into a symbiotic relationship with humans. The birds provided ecosystem services of pest and predator control. The humans provided artificial nesting structures.

The design of purple martin birdhouses had to take into account the preferences of the bird. Purple martins prefer to nest alongside others in colonies, thus large structures with multiple nests or gourds hung near each other became standard. Alexander Wilson, who wrote in 1828 slightly before Audubon, noted the common construction of birdhouses for the purple martin:

Wherever he comes, he finds some hospitable retreat fitted up for his accommodation and that of his young, either in the projecting wooden cornice—on the top of the roof, or sign post—in the box appropriated to the Blue-bird; or, if all these be wanting, in the dove-house among the pigeons. ... Some people have large conveniences formed for the Martins, with many apartments, which are usually fully tenanted, and occupied regularly every spring.¹⁷

In addition to his own description, Wilson printed a letter from a friend who had hung up a ‘large box with a number of apartments for the Martin’.¹⁸

Large apartments like this were constructed to accommodate the needs of both birds and humans. Designs such as a 1925 patent filed by Ollie C. George of Illinois tried to make cleaning the houses easy by using detachable pieces. They tended to mimic human housing, containing features such as gabled roofs and columns.¹⁹ The naturalist P. A. Taverner critiqued this trend, arguing that although a house may be pleasing artistically, the bird’s nesting needs should come first:

A shingled cottage built to look like a medieval castle is bad taste, and a bird house in too close imitation of a city hall, viewed by the canons of pure art, is equally questionable. Artistically, the most successful bird house is the one, which, while fulfilling the practical bird requirements, retains pleasing lines and agreeable surfaces but looks frankly what it is – a house for birds and not a toy human habitation.²⁰

In spite of this criticism, many purple martin houses were designed to appeal aesthetically as much to humans as to birds (Figure 2).

¹⁷ Alexander Wilson, *American Ornithology; or Natural History of the Birds of the United States*, vol. 2 (1828), 407.

¹⁸ Wilson, *American Ornithology*, 409.

¹⁹ See for example patents US1522815 (1925), US2915040 (1959), and US3757742 (1973).

²⁰ P. A. Taverner, ‘Bird-houses and their occupants’, *The Ottawa Naturalist* 32, no. 7 (January 1919): 121-125, p.120. Charles R. Brown made a later critique of commercial aluminum purple martin birdhouses which had entered the market as being unsuitably designed for the bird’s needs: Charles R. Brown, ‘Inadequacies in the design of purple martin houses’, *Bird-Banding* 49, no. 4 (1978): 321-325.



Figure 2. Purple martin house in Mabel Osgood Wright, *Gray Lady and the Birds* (1907).

In the early 20th century, urban spaces in particular were seen as needing birdhouses to provide habitats for birds. Because city streets and parks were maintained under ‘clean cultivation’, that is with dead wood and tangled brush removed, bird nesting sites were missing. This made it ‘more necessary to provide artificially the necessities of bird life that are missing. Bird boxes will largely compensate for natural cavities in trees’.²¹ These concerns were voiced as part of the growing bird conservation movement that began in earnest at the turn of the 20th century in response to hunting of migratory birds in North America. The success of the movement peaked with the passage of the Migratory Bird Treaty Act of 1918, which adopted strict controls on the taking of non-game birds. Although the

²¹ Taverner, ‘Bird-houses and their occupants’.

main focus of bird conservation legislation was limiting killing of birds, conservationists quickly expanded their focus to providing more bird nesting places.²² Offering birds suitable housing and systematic feeding were considered key elements ‘of protecting and conserving our wildlife’.²³ Suburban, residential, and urban park areas were described as ideal places to increase the average number of birds per acre through provision of artificial nesting sites.²⁴

Martin houses were available for purchase from commercial builders—by 1916 there were at least three manufacturers furnishing houses complete with a pole.²⁵ Standing on a pole rather than being attached to a tree allowed the houses to be cleaned after the martins migrated in the autumn and then re-erected in spring before the birds arrived. Individuals with carpenter skills were encouraged to construct their own martin houses, so authors discussing birdhouses always included purple martin house design descriptions, although these varied widely.²⁶

Birdhouse design and building competitions were set up in the early 20th century to engage young people in nature conservation. In one small Vermont town, St. Johnsbury, about 200 nesting boxes were constructed by local schoolchildren and hung up around town between 1917 and 1919.²⁷ The houses were constructed as part of a competition organized by the local Museum of Natural Sciences that included lectures on bird species and their nesting requirements.²⁸ The town’s shop instructor Leon Baxter felt that making the birdhouses was a way ‘to lead the boy and girl toward their proper relationship with their feathered friends of the air, and to instil [sic] the feeling of protection toward our native birds’.²⁹

Although a wild bird, the purple martin was encouraged to settle in manmade structures, in order to in some sense domesticate the wild birds and put them to use. A writer at the end of 19th century put it bluntly: ‘The Martins have become so domesticated that they follow man wherever he goes, provided, he offers the proper inducements in the way of building places. In town or country they are equally satisfied’.³⁰ Purple martins have transitioned to life in

²² See John R. B. Masefield, *Wild Bird Protection and Nesting Boxes* (Leeds: Taylor Brothers, 1897) for a British example of advocating nesting boxes as part of wild bird conservation at this time.

²³ Bradford A. Scudder, *Conservation of Our Wild Birds* (Boston: Massachusetts Fish and Game Protective Association, 1916), 8

²⁴ E. R. Kalmbach and W. L. McAtee, *Homes for Birds*, Farmer’s Bulletin No. 1456 (Washington DC: US Department of Agriculture, 1925/30), p. 2

²⁵ Scudder, *Conservation of Our Wild Birds* 32.

²⁶ For example, Scudder, *Conservation of Our Wild Birds*, 32-34; Kalmbach and McAtee, *Homes for Birds*, 12-13.

²⁷ Inez Addie Howe, ‘Introductory note’, in Leon H. Baxter, *Boy Bird House Architecture* (Milwaukee: Bruce Publishing, 1920).

²⁸ Baxter, *Boy Bird House Architecture*, 23-24.

²⁹ Baxter, *Boy Bird House Architecture*, ‘Author’s Preface’.

³⁰ Howard Jones and N. E. Jones, *Illustrations of the Nests and Eggs of Birds of Ohio with Text* (Circleville, OH: Robert Clarke & Co., 1886), p.107

human-constructed homes; so much so that a study from 1974 claimed that the purple martin ‘now nests almost exclusively in houses provided by man’.³¹

The history of the purple martin is instructive for how a distinction between *artificial* and *natural* can play out in the urban space and how that might contribute to a fuller appreciation their role as domesticators of *second nature*. Animals that live in the city often locate their dens and nests in human-built structures, making their homes out of what we can term the *artificial*. *Artificial*, meaning made by human hands through art or craft, can be contrasted with *natural*, which then takes on the connotation as not being made by humans. Before going further I will note that the nature-culture divide has been criticized, and rightly so, on many counts. If we think of nature on one side and culture on the other, we miss out on the hybridity of human history—that we are both nature and culture at the same time. For at least the last two hundred years, humans have been living in the Anthropocene, an unprecedented era of human influence on the planet. No place on Earth has been left unaffected by human action, so the distinction between artificial and natural can be seen as problematic.

Yet from the environmental historian’s vantage point, the distinction is useful for understanding how certain urban phenomenon come to be manifest. It is not just human bodies that create the urban environment—it is the many things that humans make. The technological things of the urban fabric are *artificial*, in the sense that they are constructed through human arts. This does not mean that their components did not come from the nonhuman world, as they indeed must have, nor that humans have complete control over them. In that sense, the artificial is natural since it is of nature. Yet there is a question of degree—brick houses, skyscrapers, concrete bridges, and asphalt streets could not possibly exist without humans creating them. In this sense, there is a distinction between the things humans can make (*artificial*) and the things they cannot (*natural*) in a city.

This is where the idea of *second nature* comes in. In Clarence Glacken’s classic *Traces on the Rhodian Shore* (1967), he describes ‘second nature’ as ‘the novelty that men could create in nature. ... The occupations, crafts and the skills of everyday life were evidences that changes were possible that either brought order, or more anthropocentrically, produced more orderly accessibility to things men needed’.³² Here the stress is on the material and technological changes humans are able to make in order to create environments best suited for their habitation.³³ This is the kind of ‘second nature’ William Cronon puts forth in his

³¹ Jerome A. Jackson and James Tate, Jr. ‘An analysis of nest box use by purple martins, house sparrows, and starlings in eastern North America’, *The Wilson Bulletin* 86, no. 4 (1974): 435-449.

³² Clarence J. Glacken, *Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century* (Berkeley: University of California Press, 1967), p.116-117. He titles his third chapter ‘Creating a Second Nature’.

³³ While some appropriations of the ‘second nature’ concept have used the term to describe the relation between human social structures, particularly politics, and nature, I want to reserve the concept for a more material interpretation. The politically-aimed reading of the concept comes in Hegelian and Marxist scholarship, often in the disciplines of geography and

analysis of the making of Chicago and its hinterlands, a new nature ‘designed by people and ‘improved’ toward human ends, gradually emerged atop the original landscape that nature—‘first nature’—had created as such an inconvenient jumble’.³⁴ Second nature has met with criticism as reifying a dichotomy between humans and culture, since it would appear to claim that what humans do is fundamentally different than what nonhuman forces do.³⁵ While agreeing with the critical concerns that splitting humans away from nature is unproductive, I think the second nature concept need not split the two. Like the distinction between artificial and natural, second nature is a matter of degree of material change resulting from human technological intervention. Second nature may prove a better way to conceptualize the ‘built environment’ since it stresses the built as nature.

The purple martins who live in human-made birdhouses are domesticating the second nature that humans built, and in so doing they make it their own. Through their actions to inhabit these structures, birdhouses become an integral part of the bird’s *umwelt*, its own world and environment.³⁶ The birds perceive and react to birdhouses without knowing the creator’s scripts—that the house will attract a species desired by humans, that only certain birds should use certain houses, that the designs should accommodate cleaning by humans, etc. Instead, the birds react to the houses as potential habitat, making their own decisions about integrating (or not) a structure into their lives.

At the same time, the purple martin is also domesticated through its domestication of birdhouses. Humans have provided the domus for these birds, inviting them to live in close proximity to human houses and in urban areas. Humans have lured the bird into service—whether to catch pests or drive away predators or be aesthetically pleasing to humans. This moves the bird into the human sphere.

BAT BRIDGES

political science. See for example Neil Smith, *Uneven Development: Nature, Capital, and the Production of Space* (Athens, GA: University of Georgia Press, 1984); Bruce Braun and Noel Castree, eds. *Remaking Reality: Nature at the Millenium* (London: Routledge, 1998); Crina Archer, Laura Ephraim, and Lida Maxwell, eds., *Second Nature: Rethinking the Natural through Politics* (New York: Fordham University Press, 2013).

³⁴ William Cronon, *Nature’s Metropolis: Chicago and the Great West* (New York: W. W. Norton, 1991), p.56.

³⁵ Urban historian Martin V. Melosi makes this critique in ‘Humans, cities, and nature: how do cities fit in the material world?’ *Journal of Urban History* 36, no. 1 (2010): 3-21. Similar critiques have also come from geographers, e.g. David Demeritt, ‘The nature of metaphors in cultural geography and environmental history’, *Progress in Human Geography* 18, no. 2 (1994): 163-185 and Margaret Fitzsimmons and David Goodman, ‘Incorporating nature’, in Braun and Castree, *Remaking Reality*.

³⁶ I have been influenced by scholarship in semiotics from the Tartu school, which has its roots in the work of Jakob von Uexküll and is now expanding through the work of ecosemioticians such as Timo Maran, who has looked significantly at how animals view the world.

Just as the purple martin has domesticated second nature, the bats I encountered in Austin are also domesticating agents. The Central Texas region has long been a bat haven. The limestone caves and sinkholes of the area make good habitat for the 33 species of bats that live in Texas.³⁷ Bracken Cave located near San Antonio, Texas has the largest bat colony in the world -- over 15 million Mexican (or Brazilian) free-tailed bats (*Tarida brasiliensis*) use the cave as a maternity ward to give birth to their young.³⁸ But having plenty of “natural” places in the countryside to roost did not stop bats from becoming urban dwellers.

The Congress Avenue Bridge (officially renamed the Ann W. Richards Congress Avenue Bridge in 2006) has crossed the Colorado River in downtown Austin to connect the two sides of town since 1910. In 1980, the bridge, which is 81 feet wide and spans 954 feet, was renovated. The new design of bridge added ¾ inch wide expansion joints, which turned out to be perfect nooks for bats.³⁹ The bats begin showing up to roost under the bridge in 1982. It appears that the earliest bat residents had previously lived in a broken sewer pipe under Congress Avenue, but the numbers rapidly increased with bats attracted from elsewhere. The bridge is located near urban lakes that have significant flying insect populations that serve as the bats’ food.

The designers of the new Congress Avenue Bridge have never intended their structure to be bat habitat, but the bats saw it differently. They domesticated a structure that met their own needs: it was a protected haven free from predators, had an appropriate surface for their young bats to hang on, and was close to insect-rich feeding grounds. The urban setting of the bridge in the middle of the capital city with significant automobile traffic did not act as a barrier.

Some reactions to the bats’ appropriation of the bridge were negative. In September 1984 newspapers carried articles about the “several hundred thousand” bats under bridges and in some buildings in the city; four people had been bitten by bats, raising some concerns about rabies which can be transmitted by bats.⁴⁰ Anyone who is bitten by a bat has to undergo a series of rabies shots, so it can be an ordeal even if only two to three percent of all bats in the

³⁷ Amy Price, ‘Bat Mania’, *Texas Parks & Wildlife*, January/February 2015, online edition http://www.tpwmagazine.com/archive/2015/jan/ed_2_bats/

³⁸ Bat Conservation International, ‘Bracken Cave: protecting a jewel in Texas’, <http://www.batcon.org/our-work/regions/usa-canada/protect-mega-populations/bracken-cave>. Accessed 14 August 2016.

³⁹ New York Times News Service, ‘Bridge helps Austin, Texas, become city of bat awareness’, *Gainesville Sun*, 31 August 1992, p.1D.

⁴⁰ United Press International (UPI) and issued an article about it so versions of the story appeared in newspapers countrywide, from *Lakeland Ledger* (Florida) to *Spokane Chronicle* (Washington) around 24-25 September 1984. A long feature article appeared in *The Washington Post*: W. Gardner Sel, ‘Austin’s I-beam bat haven’, *Washington Post*, 13 October 1984.

area carry rabies.⁴¹ According to a city health administrator, the city government considered covering the expansion joints with wire screens or rubber, but decided against it since the bats might relocate to even less desirable places (from the human perspective) like parking garages.⁴² Bat researcher and founder of Bat Conservation International (BCI) Merlin Tuttle noted that Austin's local newspaper coverage was overwhelmingly negative in 1984 with headlines such as 'Bat colonies sink teeth into city'.⁴³ Tuttle relocated the headquarters of BCI to Austin in 1986 and worked to change public opinion about the bats.⁴⁴

The bats were rapidly adopted as a tourist attraction and even symbol of the city. A *Texas Monthly* magazine article in 1989 noted that small crowds of 50 or so people were gathering at sunset on the bridge or on the hike-and-bike trail underneath it to watch the bats emerge.⁴⁵ By 1990 the bats were recognized by the city parks and recreation department as a nature attraction worthy of a large educational display along the river's trail.⁴⁶ The city approved the installation of artist Dale Whistler's kinetic metal sculpture of a stylized bat in a triangular intersection island near the bridge in 1998.⁴⁷ The annual Bat Fest, featuring live music, art and craft vendors, and bat-themed activities on the bridge including watching the nightly emergence, started in 2004.⁴⁸ Bat watching cruises are offered by several companies to provide a view from the water and bat activities are highlighted in development studies and plans for the city.⁴⁹ Seeing the bat emergence is listed as one of the top 20 things to do in Austin on TripAdvisor.⁵⁰

The bats had been thoroughly domesticated into Austin culture 20 years after they had moved in under the bridge. In 2010, the Austin City Council proclaimed the Mexican free-tailed bat as the 'official animal' of Austin, noting that the colony 'is an integral part of the character

⁴¹ The original UPI version carried the headline 'Rabies-carrying bats invade state capital', 23 September 1984, <http://www.upi.com/Archives/1984/09/23/Rabies-carrying-bats-invade-state-capital/5794464760000/>

⁴² Sel, 'Austin's I-beam bat haven'

⁴³ Merlin Tuttle, *The Secret Lives of Bats: My adventures With the World's Most Misunderstood Mammals* (New York: Houghton Mifflin Harcourt, 2015), page ix.

⁴⁴ Merlin Tuttle, *The Secret Lives of Bats*, page x.

⁴⁵ Joe Nick Patoski, 'The real bat show', *Texas Monthly* (Aug 1989), 86.

⁴⁶ Cox News Service, 'Austin's bats to become official tourist attraction', *Lawrence Journal World*, 29 April 1990, page 2C.

⁴⁷ See details about the sculpture at

http://www.waymarking.com/waymarks/WM8M6J_Nightwing_Austin_Texas

⁴⁸ Lindsey Galloway, 'Go batty in Austin, Texas', *BBC*, 16 August 2011, <http://www.bbc.com/travel/story/20110817-worldwide-weird-go-batty-in-austin-texas>

⁴⁹ For example, Citi Arts, Public Art and Urban Design Consultants, *Austin Alive: Mapping Place through Art and Culture* (2007),

https://www.austintexas.gov/sites/default/files/files/EGRSO/downtown_arts_dev_study.pdf.

⁵⁰ TripAdvisor, 'Congress Avenue Bridge / Austin Bats',

https://www.tripadvisor.com/Attraction_Review-g30196-d106309-Reviews-Congress_Avenue_Bridge_Austin_Bats-Austin_Texas.html

and culture of our city'.⁵¹ This domestication of the bats has been a response to the bats' domestication of the bridge.



Figure 3. The crowd gathered in downtown Austin on the Congress Avenue Bridge, as well as on boats on the river, to see the nightly bat emergence from under the bridge, March 27, 2016. Photograph by author.

It turns out that bats had been adopting bridges as homes throughout the US. In 1994, a survey of Texas bridges found an aggregate population of five to six million bats living under bridges.⁵² Field surveys of 2,421 highway structures in the southern states along with a literature survey of the northern states concluded that there were at least 211 highway structures in the US inhabited by bats in 1999, but this number might have been a very low estimate.⁵³ Scientists began advocating structural changes to bridges to create suitable bat

⁵¹ Austin City Council, Resolution No. 20100408-028

⁵² Kim Jenkins, *Texas Department of Transportation Wildlife Activities* (Austin: Texas Department of Transportation, 1996), 6.

⁵³ Brian W. Keeley and Merlin D. Tuttle, 'Bats in American bridges', *Proceedings of the Third International Conference on Wildlife Ecology and Transportation*, Missoula, Montana, 1999. A later study estimated nearly 300 bridges in Florida alone were occupied by bats, meaning that the Keeley and Tuttle number was very low: see Jeffrey A. Gore and Karl R. Studenroth, Jr., *Status and Management of Bats Roosting in Bridges in Florida* (Tallahassee: Florida Department of Transportation, March 2005).

roosting places.⁵⁴ The Texas Department of Transportation even developed a design program to make bridges more bat friendly.⁵⁵ This does not mean, however, that bats are always desirable under bridges: in 1994, bat exclusion structures were added to one section of the Congress Avenue bridge where public safety was a concern.⁵⁶

The Congress Avenue Bridge is an artificial human creation, but it is also part of the bats' natural world. The human population in Austin has created a new nature, a *second nature*, that is different from what would be in the location of the city otherwise. Yet, to the bats, the bridge is simply one more place in the world to roost, and a particularly good place at that. The label *second nature* helps humans identify the changes to environments that humans have brought about, but from the bird or bat point of view, the distinction is irrelevant. For the animal, the things which humans build are simply part of their environment and potential habitats. The bats have domesticated these technological artefacts because to them all things are just nature. The animals choose whether or not use human artefacts as homes based on their own needs, not ours.⁵⁷ While humans may entice some wild animals to live near them in the city, they cannot force them to do so.

BUILDING A WILDER URBAN WORLD

Human urban building practices have created suitable homes for birds and bats. The purple martin and the free-tailed bat have adopted artificial structures to nest and roost, turning the human-made structures into their own domus. In the case of the purple martin, humans intended the habitation all along—the houses were intentionally constructed with the birds' needs in mind in order to coax them to move in. In the case of the free-tailed bat, the design was unintentional, but the bats found it, took up residence, and then the humans ended up adapting their building practices to encourage the bats' behaviour elsewhere. Both birds and bats have become integrated urban residents.

These two histories challenge the distinction between artificial and natural, yet the distinction is not without merits. The artificial objects—the birdhouses and concrete bridges which could not naturally exist in their form without human arts—are natural from the animal point of view, but humans did indeed make them intentionally. *Second nature* is made up of these artificial objects. The label of *artificial* points out the agency of creation, while not limiting the agency of use. STS domestication theory stresses that technologies are not finished when

⁵⁴ For example, Keeley and Tuttle, 'Bats in American bridges'; Edward B. Arnett and John P. Hayes, 'Bat use of roosting boxes installed under flat-bottom bridges in western Oregon', *Wildlife Society Bulletin* 28, no. 4 (Winter 2000): 890-894.

⁵⁵ Texas Department of Transportation, 'Bats 'N' Bridges', undated brochure. <https://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/kids/bats.pdf>

⁵⁶ Jenkins, *Texas Department of Transportation Wildlife Activities*, 6.

⁵⁷ Animal agency is well established and uncontroversial in animal history studies, as evidenced by the essays in Susan Nance, ed., *The Historical Animal* (2015); yet many fields of history still struggle with giving animals agency in their narratives. Because I believe that animals 'choose' their homes, I give them free will, even if they make those decisions based on standards other than what humans might use.

they leave the factory and enter people's homes and lives. It is through the process of domestication that the technologies come into being, a give-and-take between the humans and technological artifacts in social settings. Both humans and animals are involved in domestication process. That means that artefacts may be repurposed in ways unintended by designers, or rejected altogether. Importantly, even if humans try to build urban artefacts that are bird- or bat-friendly, it does not guarantee their use. The wild animal who is invited into the domestic sphere of the urban world with artificial habitats always retains its ability to choose.

The house—the *domus*—for more than half of the world's population of humans is the city. Animals co-inhabit that house. In the writing of urban history, we can no longer ignore the wild animal inhabitants of the city. Human-made structures are animal domiciles—lively habitats that serve as the places in which animals play out the drama of life and death as much as humans do. It turns out that historical choices about where to place structures, how they should be shaped, and how they can be adapted have often intentionally considered animal inhabitants. Choices to hang up an apartment-style purple martin house or to close off bat roosting crannies matter to both the human and animal. Urban bats and birds are not interlopers or marginal inhabitants on the edge—they are right smack in the middle of cities under bridges and in backyards.