The Rodent Bait Station as Reservoir

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December 8, 2021

Intro

This paper was presented at the conference "Reframing Disease Reservoirs: Histories and Ethnographies of Pathogens and Pestilence", organized by,Matheus Alves Duarte Da Silva, Jules Alexander Skotnes Brown, Oliver French, and Frederic Keck, May 28, as part of the ERC project "The Global War on the Rat" (Christos Lynteris, PI)

An Architecture of Position

I'm not here to talk about medicine, or disease. I'm here to talk about architecture. Lucky me that this panel has been labeled as about architecture, so that the organizers do not have to regret giving me control of the microphone.

In *Stones of Venice* from the 1853s, John Ruskin made a minor but significant distinction between what he called architectures of protection and architectures of position. The former were all those buildings designed to protect us and our livelihoods from nature: homes, barns, hearths, fences. Architectures of position by contrast face outwards, facilitate movement and expansion: stairs, barricades, towers, forts. An architecture of position is perhaps the most emblematic element of modern settler colonial governmentality. It's orientation is towards settlement, towards vigilance, towards surveillance, towards assimilation or eradication.

I want to talk about another architecture of position today. One that it is everywhere, not just in America, but increasingly all over the planet, but which you have likely never noticed.

This is a Rodent Bait Station

[bait station]

This is a rodent bait station. They are ubiquitous today. They are behind restaurants, in alleyways, around apartment complexes tucked beneath patios, or bushes. Sometimes the boxes are attached to walls or fences where rats might run, but usually they sit on the ground, often secured with a stake and locked to avoid tampering. Sometimes you might catch a glimpse of one shaped like a small boulder—an effort to "get the job done without drawing too much attention to your pest control system".

[techs]

In the last two years, I have spent dozens of grueling days walking through neighborhoods, apartment complexes, 2000-property housing developments, down bucolic gated paths, around man-made ponds and up landscaped hillsides that run straight into "wilderness", as a pest control tech wearing gloves, and carrying a 5 gallon bucket full of baits repeats the same action: Locate bait station (they almost always remember the exact location of all of them), kneel down, grab the plastic "key" connected by a cord to the bucket that unlocks the bait station, open, brush out debris, examine the bait; if it is diminished, replace it with a new block, if not, leave it there and close the station and repeat 12 hours a day 5 or 6 days a week.

The box is not a trap: rather, it is designed to allow rats to enter into the box from one side and leave from another, into a safe place, one protected from predators like owls or hawks, and while there to safely consume a block that has been placed inside. This block is a "paraffinized bait block" that is primarily made of some food source, like oats, an attractant of some kind, flavoring, blue, red or green food coloring, and a poison that will kill the rat.

Just a word about my new friends the pest control techs. I do this work in Los Angeles, with about three different firms, and handful of other folks in wildlife management, conservation biology, agricultural extension, vector control, and veterinary public health which together make up an underappreciated, underfunded, mixed private and public governmental apparatus dealing with animals, insects, and disease. Pest control techs themselves are primarily white and male; other than the owners, they are mostly uneducated.

They are often people who enjoy hunting and fishing, but are also, in many cases, animal lovers or people who might have become foresters or biologists in another life. There is a clear hierarchy within the work from those who deal with bugs (the termite division) to those who deal with rats, to those who trap squirrels or raccoons, to those who do the prestige work of tracking and trapping coyotes in the city. Interestingly, disease experts are at the top of this hiearchy, just below the academic biologists who study exotic urban animals like bobcats or mountain lions.

[how I got into this and why]

[same intuition as Sodikoff that these folks might have minro knowledges about animals in the city that academics don't – "commensal archive"]

Vector control and the management of rats

The bait station is the main tool in the management of rats globally. Our media consciousness is more likely to imagine the snap trap, beloved emblem of American ingenuity, but really, it is the bait station that is now at the very center of a global war on the rat.

[posters]

Why do we—and I should say, although this is not a universal we, it is a global one—why do we kill rats? There are many answers here, but let's start with the practical: We kill rats because we don't want to live with them: they eat our stuff, they damage our buildings, they scare us and disgust us. But these are mere nuisances. We *could* live with rats, like any nuisance we choose to live with, it is largely a matter

of convenience that our bloodlust is unchecked.

[keck]

As F. Keck put it in the conclusion to a wonderful collection about Animals as villans, this is a pastoral problem… a problem of governing rats, keeping them in their place: "The pastoral problem is how to control ecological nuisances in such a way that they don't turn into epidemic villains" (232 Keck)

What I want to stress today, however, is that there is never just one villain. Under settler colonial forms of governance, the price of freedom is eternal vigilance. Settler colonialism is neither, or not first, pastoral or biopolitical, but one organized around control where control is possible, and where it is not, eradication.

[vector control]

The epidemic villainy is probably more familiar to this audience, but it is worth reiterating. The reason we can't live with rats, the source of the global war on rats, is the theory and ideology of vector control. By identifying the rat as the chokepoint in the local circulation of viruses, bacteria, fleas and worms, modern disease governance has found a precise target, one that is, ostensibly, easier to control than the microscopic elements that are more directly responsbile for human and animal disease suffering.

The innovation of the bait station and its progress

For one thing, the practice of vector control, as many people here have detailed in cases around the world, has given significant momentum to the practice of managing rats.

Rat catching has always been with us, but it is not an accident that the same period that gave rise to the germ theory, to the idea of animal vectors of disease, to the discovery that mosquitoes and fleas, and therefore also rats, participate in human disease, also saw the beginning of the end for the rat-catcher.

[rat catchers]

The rat-catcher, whose history and avatars are form a minor detective literature stretching back at least to the 17th century, are hunters, albeit of small rather than large game. The great rat-hunters in the somewhat small and obscure literature of rat-catching of which I am now a huge fan, culminate in a late 19th century and early 20th century consensus around rats and rat-catching, involving the elements of becoming-rat one needs to track them: seeing signs of their activity, thinking like a rat, the creative placement of a snap trap, folk recipes for bait mix and attractant.

Such techniques are still taught today. I learned many of them during my stay at the West Coast Rodent Academy, where such rat hunting, feces identification, trap placement and exclusion techniques are taught.

[WCRA images]

But as I also learned at the Academy from a seasoned pest control veteran: "We've become a device deployment industry—you've got a rat problem, we've got a rat-box, unfortunately, that's what the industry has become, and it's soul-stealing work." (Notes, WRA Nov 2019)

The bait station is not about hunting rats. It is an architecture of position. It "artchitecturalizes" theories of rat behavior and physiology in order to attempt to filter rats from the surrounding environment—strictly speaking to get the poison into the rat and only into the rat. It aims to make various forms of

rat-knowledge durable in a deployable, scalable, device.

[Box]

The box is an important part of this story, but so is the poison that goes in the box. They work together to entice rodents in, and only rodents, deliver the poison, and then let them leave, so that more rodents can come in. Unlike a trap, which can usually only do one rat at a time, the bait station allows for volume killing.

Decades of research have gone into rat behavior for this purpose. The recognition of rat "neophobia" has long been central: the idea that rats have a very pronounced suspicion of new objects placed in their environment. Thus, some level of familiarization— sometimes called "pre-baiting"— is necesary for the bait station to be effective.

Rats being smart, however, a second problem is that rats associate and remember very well—so a bite of something, or even a smell, that triggers a nausea response, can warn them off of a poisoned bait—-a classic conditioned stimulus response.

[garcia]

But in the late 1960s, UCLA psychologist John Garcia showed that the time delay between stimulus and response could severed the connection. This "Garcia effect" gave a name to what rat poison manufacturers already knew and sought after: namely a colorless, odorless, tasteless poison whose effects come well after the consumption of the poison. Only one rat poison fits that bill so far, which we will come back to.

The bait station's inventor Elton

[Elton]

Both the epidemiological model of rodent management and the very design of the bait station originate in the same place : Charles Elton's Animal Population Bureau. As part of the quite monumental three-volume work from 1954 *Control of Rats and Mice* (ed. by Dennis Chitty), Elton contributed several chapters on killing rats, including chapter 3 "Containers for Baiting" whose authors are (poignantly) listed as "Charles Elton and the late R.M. Ranson". Ranson was the chief inventor here, especially of the *piece de résistance* the "Protected Poison Point" or P3.

Elton contextualizes the need for such a box in "epidemiological" terms, suggesting that the right way to address the presence of rats is not to treat them as an acute infection, but a chronic one in need of a "network of semi-permanent poison bait points. (147)"

[quote]

Elton's previous work on voles and "the background of the sylvatic plague problem in western United States" led him to the idea that controlling rats was primarily an issue of density of the animals. Rather than an aggressive campaign of eradication, which is costly and has ecological effects that "defeat the object of control", instead it "is possible to apply planned moderate control over very wide areas at low cost, and to sterilize completely areas where there is serious danger from rodents." In this way we would achieve "rational control in the light of definite knowledge of the habits and population dynamics of the various species" (148). Elton's interest was not only, and perhaps not even primarily in preventing disease

so much as it was in devising a way of controlling the size of populations such that they could be confined to their niche, and have no need of invading ours.

[P3]

These architectural elements connected rat behavior, human observation, unpredictable weather, and the morphology of other animals through a design consisting of three parts: a tunnel, a "go-up" and a baffle.

Getting rats to go into something is ironically very difficult for the people trying to keep rats out of things. Thus, a bait box needs to provide a way for rats to enter that reduced this strangeness. This is accomplished by allowing rats to enter the box from below, thus staying on familiar (dirt or concrete) ground. Once in the tunnel, rats can "go up" the step into the box on the analogy "it is common for rats to gnaw their way through the floor from underneath" when they enter a shed or home. Once up into this tiny shed, the rat can access the poisoned baits that wait for them.

Targeting rats and only rats necessitated the baffle: ""The reason for making the baffle overlap the inner compartments is partly to make it more difficult for the poison bait to spill out if the P3 is accidentally tipped over, and partly to add to the rat-specific qualities of the container by keeping out long-necked birds."

[Ranson reports that the box was tested, patented, and has gone into production, though not without some difficulties due the shortage of appropriate wood, and the bulkiness, which led to an IKEA-like flat-pack version of the P3 which led to a "sectional" design which required no tools other than a hammer to construct. The UK Ministry of Food was by 1954 the largest purchaser, who made and distributed 7600 of them. "Five hundred were sent to Malta in 1945 to assist the rat campaign during a small plague outbreak on the island" (154).

Finally, Ranson reports on three issues related to the bait box that persist to this day: lag, cover, and storage. "Lag" refers to the rats' resistance to going into a box. It can take days or weeks before a rat will go into a bait box, and often if it is moved, even slightly, this can result in it becoming novel or strange again.]

However, once accustomed to the box, rats will visit it regularly, whether or not it is baited, the assumption being that it provides cover, if not comfort and safety, and indeed, in the experience of Ranson and Elton, rats can truly make a box into a home, as this glorious list of items discovered inside the P3 suggests:

[list]

"Pieces of gristle. Remains of dung beetle (*Geotrupes stercorarius*). Orange peel. Slices of bread and butter. A government form dealing with swine. Empty shell of water snail (*Limnaea stagnalis*). Many partly chewed earthworms (on one occasion 27g). Pieces of fish skin. Potatoes. Stems and leaves of elder (*Sambucus nigra*). Dead young rat (*R. norvegicus*) slightly gnawed. Willow (*Salix*) leaves. Knuckle bone. Leaves of plantain (*Plantago media*). Lumps of suet. Empty packet of 'Woodbine' cigarettes. Piece of electric cable. Piece of ox stomach. Sheep's wool. Head of a starling (*Sturnus vulgaris*). 1000g 'Dairy nuts' cattle cake brought in during one night [a picture is included in the text as Plate 1]. 27g. cotton seed cake brought in during one night. General rubbish such as grass, stones, hay, straw, sticks, &c." (156).

Ranson dryly concludes that this "strange collection of objects from civilization and from nature does

suggest that some rats regard P3 as a safe storage place and a refuge."

Personally, I can confirm that the bait station often becomes a refuge. But what is perhaps even more interesting, and more ecologically significant is the way that it becomes a novel ecological refuge for organisms u other than rats.

[snails]

In more than one case I have seen the novel ecologies that emerge in a bait station: slugs, crickets, black widow spiders, lizards, snakes, a veritable horror show of an ecology.

One case in particular sticks with me: snails. Often rodent bait stations in California are filled with snails and snail poop, as you can see here. The fact that the poison does not kill the snail is related to the fact that snails do not have a circulatory system.

[Snail poop]

Nonetheless, they are quite capable of consuming and distributing the poison a snail's distance away from the bait station, as you can see here.

Bait station ubiquity, the problem of pastoral power

Today, the bait station is now required equipment for all rodent management programs in cities. National and local governments regulate them for their tamper-resistance and their inaccessibility to pets and children; pest control firms deploy them daily by the hundreds. Any barn-owner, CAFO-slumlord, city resident, high-rise manager, or home owner's association tasked with controlling rats is likely to contract with a pest control company.

[magic mountain - mountain top - Getty]

The range of different places I have visited and seen bait stations refilled is bewildering: apartment and condo complexes, large gated housing developments, single family homes, hotels, palatial mansions in the hills, parking garages, Six Flags Magic Mountain, a Japanese garden, LA Sanitation water treatment plants, a famous Vampire Slayer's house, a hilltop California Highway Patrol transmission tower at the end of a 15 mile dirt road, tiny public parks and "paseos" that connect them, an oil field, University campuses, sound stages, warehouses, ranches, malls.. If humans can go there, rats apparently can too. Here's a picture of me examining one in the Getty Museum's gardens.

[bait station finder]

I sometimes play a macabre game in Los Angeles, where I drive to some part of town, park and go looking for a bait station. So far the longest it has taken me is 5 minutes.

The Poison in the bait station and its effects

[coumadin]

In principle you can put any poison in the bait station, but in practice, one particular kind of poison has proven dramatically more effective than the others: anticoagulant poisons, specifically Second Generation Anticoagulant Poisons or SGARs like brodifacoum or bromodiolone. SGARs do exactly the same thing

that blood thinners do for humans—thin the blood by blocking its normal coagulation process. For people with high blood pressure, this thinning allows the blood to move more quickly through vessels and tissues, decreasing the pressure. Take too much and it will increase the permeability of your vessels, leading to internal bleeding, hemorrhagic shock or anemia, and death. The important point here is that these poisons do not kill the rat immediately—but over the course of days. And most of them have no taste, odor, or color.

As a result, rats can go in, eat bait, leave, and come back for more. They don't die in the bait station itself, but somewhere else, outside of it. This complex design makes the poison mobile. It allows the poison-filled rat to return to the nest. A rat can live for days or weeks with the poison in its body, and it can potentially consume far more poison than is needed to kill it.

[Secondary poisoning]

Rats are nuisances for humans, but of course, they are food for other animals. Which in Los Angeles includes bobcats, mountain lions, coyotes, hawks, owls, dogs, foxes, cats,, raccoons, opposums, and a few other birds and mammals.

[bobcats and mange]

The secondary effects of SGARs have slowly become more and more alarming to wildlife biologists around the world. National Park Service employees have established that trace amounts of the poison are present throughout the foodchain in California, from the rats all the way up to mountain lions in the most remote parts of the state (Serieys et al. 2018; RILEY et al. 2007; Elliott et al. 2016). This is not just because the rats are food, but because the predators that eat the rats, such as raccoons or coyotes, are also food, and so on—like an obscene verion of the old lady who swallowed the fly. I guess they'll die.

Significantly for our story of epidemic and ecological villains, one of the secondary effects of SGARs that has been investigated is the effect it has on weakening predators immune systems, rendering them more susceptible to pathogens that might otherwise have little effect on them—or be transmitted between animals.

[Bill passed in 2020]

With the increasing scientific and public awareness, the question of how to stop the spread of this poison into the food chain has led to a variety of responses, but most loudly a call to ban the poison outright. After years of trying, in September 2020, Assemblymember Richard Bloom (from my own home district) succeeded in passing the California Ecosystems Protection Act, placing a moratorium on the use of SGARs starting January 1, 2021, until the California Department of Pesticide Regulation reviews the evidence of its secondary effects.

If the ban holds, a different solution to rat control will have to be found. So this is good news right?

The bait station is not a technology, it is a whole industry

If this story were just about a vector, or a poison, or a trap, then perhaps this would be the end. But I will remind you that I am talking about an architecture. The bait station is not a technology, it is a whole industry. Driving this industry is not just a few special interests, but a complex fabric woven out of a desire to manage and control rats: poisons and bait stations, to be sure, but also, business cards.

[HOA cards]

This bag contained about 800 business cards for property management firms and home owners associations. I got it from one of my pest control contacts. It is how he runs his business—by signing multi-year contracts with large firms to place bait stations by the thousands, and maintain a workable business strategy. Remember, Pest Control is now a device deployment industry.

Pest control capitalism is built on boxes, housing developments, maintenance contracts, and supply chains of poison and cheap, disposable labor. I say this tentatively because I know these guys now, both the workers and several owners of such firms. Orkin, Rentokil, and a few others notwithstanding, the industry is primarily made of small and medium sized private firms struggling to make it. They are anxiously aware of the damage they do, but they also exist to make a living. They are not finance capitalism, or petrocapitalism. But they build on the structures in place because of those forms of organization: contracts with large orgs; plastic boxes and poisons in supply chains that easily support their livlihood.

Here's the thing. Even if we ban the poison, we are gonna put something else in those boxes to control rodents, because it is not the poison that is causing the problem, but our relationship with rats.

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Conclude

A reservoir, for the most part, is an architecture of position. It is significant that the metaphor epidemiology has chosen to designate the natural state of zoonotic disease risk is a man-made structure designed to manage the risks associated with natural variation.

A reservoir today is an architecture to ensure constant water supply. It can be empty or full, it can spill over or flood, all of which are threats, but the goal is to maintain a constant, steady supply of water to enable expansion, vigilance, surveillance, and settlement.

It's worth thinking about what it means to attribute this capacity to a virus or a bacteria: is it a recognition of a threat not unlike the threat the humans pose to others? Or is it a misrecognition of the power of a settler colonial art of government? Even the microbe, possibly, seeks a relationship with humans that is not one of assimilation or eradication, but rather some combination of symbiosis and commensalism.

As with water, approaching death as an infinite resource is a recipe for disaster. It is not a sustainable art of governance. It is not a pastoral nor a biopolitical governmentality. When killing rats takes mountain lions and owls along with it—to say nothing of the risks it produces for humans—then we have found the limits of that art of governing.

There is no reservoir; there is only the river. There may be no other way out than to find a way to live with rats.