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THE GOOD MOSQUITO AND THE BAD: MIMICRY, BETRAYAL, AND TRANSGENIC STRATEGIES

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ABSTRACT

Technologies of genetic modification are increasingly being used or considered to control populations of disease-bearing mosquitoes. This article draws on ethnographic material and science fiction to explore affective encounters between people and new genetically engineered organisms which draw upon imagery and discourses of betrayal. Describing how the organism comes into being with and as the biblical figure of Judas Iscariot, the making and knowing of bodies is shown as much affective as material, as rooted in darkness, intimacy and violence as in the clean and clinical spaces of laboratory research. The transgenic version of *Aedes aegypti* is presented as one in a network of uncanny doubles, illustrating how the uses of unsettling insect imagery to explore elements of human sexuality also works in reverse, as the human figure of Judas emerges as a way for people to think through insect sexuality and articulate social meanings for the new kind of creature in their midst. Working in the interstices of ethnographic data and science fiction, convergences between the insect and human figure are drawn out to make the case for a nuanced attentiveness to negative affect in the implementation of novel regimes of vector control.

KEYWORDS

insects, biotechnology, Judas Iscariot, transgenic, interspecies, fecundity

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> Bursting, bleeding, biting and bargaining, Judas emerges from antiquity as a transgenic organism, human and satanic, person and animal.
>
> —Susan Gubar, *Judas: A Biography*

> Animals that are the killers and superior fighters of their groups have no enemies… So there are a host of weak things that try to hide among them- to mimic them. And man is the greatest killer, the greatest hunter of them all.
>
> —Donald Wollheim, "Mimic"

In 1940s New York, a young entomology museum assistant is returning home at dawn from a late night of arranging insect displays when a building superintendent accosts him in a panic on the street. Shrill screams, heavy thuds, and dull groans have awoken him, coming from the apartment of a strange neighbor, long known to both men. The super gathers our narrator and a policeman, but when the three men reach the threshold of the strange man's apartment, they hear only a gentle rustling, like a breeze through paper. They kick down the door.

The apartment's odd occupant had been a presence in the neighborhood for years. Always cloaked in black, never speaking, and apparently terrified of women, "[h]e was a sight from some weird story out of the old lands," writes Wollheim (under the pseudonym Martin Pearson). Our narrator remembered jeering at him as a child. As an adult, he had become obsessed by the infinitely variable morphology of insects. Especially fascinating to him was their ability to mimic other organisms. "Nature practices deceptions in every angle. Evolution will create a being for any niche that can be found, no matter how unlikely." Twig insects, moths disguised as threatening wasps, and all the myriad impostors that troupe along with hordes of army ants: it is the nature of life, he reflects, for the weak to mimic the strong. And man is "the greatest killer, the greatest hunter of them all."

Inside the apartment, the man lies dead in an unfurnished room strewn with garbage. As our narrator leans down towards the corpse, however, he sees that what seemed to be a nose is not a nose. The face is not a face, and the cloak is shiny wings beneath which are concealed an extra set of arms. The creature is not human, and it is not male: a strange emptiness in her thorax makes clear that she has recently laid her eggs. The rustling continues from within a metal box in the corner.

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When the men pry it open, they are overwhelmed by a "stream of flying things," gauzy-winged beetles, shaped like little men, pour out the window and fly off into the breaking dawn. This revelation is superseded, however, by something our narrator finds even more chilling: rushing to the window as the offspring disperse into the sky, he sees the red brick surface of a nearby chimney begin to vibrate. A pair of eyes appears, and a "great, flat-winged thing" peels itself away from the chimney and flies off in hungry pursuit of the newly hatched young.

The familiar neighborhood is suddenly revealed to be a space of anarchy, war, and betrayal. "We know little or nothing," "And yet we think we know a lot." We search for the unknown in far-flung continents, in the "science of atomics," but it is "that which is in plain view which is often best hidden." And its revelation is an unassimilable horror (Pearson 1942, 59).

Insects' capacities for mimicry and morphological change have long inspired fiction, science fiction, and horror literature (Byatt 1993; Ghosh 2011). The unease often connected with insects has taken on new valences in contemporary discussions about genetic engineering of mosquitoes for disease control. In exploring affective engagements with a vector control program, this article shows how sex and reproduction have become central to new modalities of biological control and how those same capacities can become a source of uneasiness about human powers to control entomological flourishing.

This article cites ethnographic fieldwork conducted by the author in Piracicaba, Brazil in 2016 to describe how a contemporary mosquito control program resonates with science and fiction about insects, sex, betrayal, and disguise. *Aedes aegypti* is a small mosquito which prefers to cohabitate with people and can carry dengue, chikungunya, and the Zika virus. Transgenic versions of the *Aedes aegypti* mosquito are produced by the British company Oxitec. "Sterile males" are released into local populations, diminishing their number by producing non-viable offspring with wild-type female mates. Like many transgenic population control strategies, this new program organizes culling not at the hands of humans, but by getting transgenic insects to cause death in their conspecifics. This logic of betrayal on which the program is predicated was observed by the author to elicit new local discourses about Judas Iscariot, who betrayed Jesus with a kiss. The affective tensions I describe over the rollout of this new modality of disease control raise unsettling questions as to whether humans, too, are vulnerable to their own technologies of bio-mimicry.

Male transgenic *Aedes aegypti* are equipped with a "delayed lethality gene" which is "turned off" by the presence of tetracycline in the rearing process at production facilities. Insects are sorted by sex, and male mosquitoes are released into human environments where they seek out and mate with wild females. Without tetracycline to turn off the delayed lethality mechanism, these offspring die before reaching sexual maturity. The concept depends crucially on getting wild-type females to mate with transgenic males, which in turn depends on producing males that can convincingly mimic wild-type males. Insect mimicry becomes inspiration and technique for this form of technological intervention. Certain capacities of mosquitoes are coopted. The affective resonances described here suggest that such cooptation also raises a number of fears about the limits of human control.

Insects have long been useful figures for thinking through human sexuality. Elizabeth Grosz writes in the chapter "Animal Sex: Libido as Desire and Death" in her book *Space, Time and Perversion: Essays on the Politics of Bodies* about how praying mantises and black widows "represent an intimate and persistent link between sex and death, between pleasure and punishment, desire and revenge," showing how this network of associations emerges both from the bodies of insects themselves and from constellations of concepts already linked in discourses about human sexuality (Grosz 1995, 80). In this paper I explore how a reversal of this dynamic seems to be at play in the reception of a new transgenic version of the *Aedes aegypti* mosquito: here, rather than insects serving as figures for the exploration of human sexuality, the human figure of Judas emerges as a way for people to think through insect sexuality and articulate social meanings for this new kind of creature in their midst.

I trace the figure of Judas to describe the affective encounters that emerge with this new technology of vector control. In *Insect Media*, Jussi Parikka describes the power of insects as "capable of weird affect worlds, strange sensations, and uncanny potentials that cannot be immediately pinpointed in terms of a register of known possibilities" (Parikka 2010, xiii). I explore the intensification of such uncanny potentials in encounters with organisms whose risks and capacities are sometimes not fully known nor felt. It is in the affective encounters described here that the insect takes form through intensive connections with existing and emergent discourses and figures, including that of the biblical Judas Iscariot. The fecundity and ferality of the insect body coopted as a means of extermination also doubles as the threat of mutation. Rapid reproductive potential and insect capacity

for quick evolutionary adaptation make new types of population interventions possible, but also raise the risk of unpredictable sex and mutation. Fully a part of nature, yet not fully natural, the sex and reproduction of the transgenic insect is part of an "increasing proliferation of mutant species and sexes that profoundly challenges our assumptions on what the body is and what it can do" (Parisi 2004, 7). Disrupting a genealogical logic of species difference and identity, genetically engineered sex emerges from heterogeneous assemblages of various orders of being. Methods of genetic modification adapt bodily substances and techniques from other organisms, from viruses to corals, and the sexual reproduction of mosquitoes targeted by projects like Oxitec's is carefully choreographed by human researchers and employees. A newly horizontal sexual network emerges, forging intimate and threatening interspecies relations. Inserting themselves in the sex of the insects, humans are not immune to being penetrated themselves by foreign bodies, or of being betrayed by the many disguises of insects. This dangerous intimacy is often processed through tropes of betrayal and nightmares of mimicry.

Wollheim's story enters the genre of horror when the men discover the terrible female-ness of the insect-man. Rosi Braidotti (1997) writes in "Meta(l)morphoses: The Gendered Nature of Becoming" about the history of science fiction parallels between the woman's body and that of the alien, insect, or animal. The horror of birth, the broken abdomen, and the dread with which the men turn to look for what it is she has given birth to underline the nightmarish potential of overflowing insect life and of the female body. In the story of the transgenic insect, as well, species masquerade blends with sexual betrayal.

While the Oxitec males are not technically sterile, the widespread use of this term in company literature on the insects is intended to establish a connection with the considerably older Sterile Insect Technique (SIT). Pioneered in mid-century America, SIT uses radiation to sterilize male (mostly agricultural) pest insects in a process of autocidal control, aimed at breaking a population's reproductive cycle. In the case of the Oxitec mosquito, sterilization is not achieved by irradiating otherwise normal males. Instead, the insects produced in Oxitec laboratories are transgenic, meaning sequences of DNA from other organisms are inserted to produce a unique life form: the tetracycline dependent male mosquito, fecund and capable of deceiving its mates.

The mosquito's becoming happens not only in the laboratory, but also in the in-between spaces of affective encounters taking place in open-air releases throughout the city. The mosquito, not yet stabilized in its social or ecological milieus, emerges with and through these encounters. This "becoming-with"

between species often appears mutual and destructive, high-tech and uncanny, utopian and dreadful in equal measures. Through recounting experiences with ethnographic fieldwork in areas where the mosquito has been or may be released, I describe the insect as becoming-with and as the figure of the betrayer. The figure of Judas is also becoming-with these dynamic affective interfaces, rearticulated through the concretization of a newly acquired insect body. Like Judas and Jesus, there is an uncanny mirroring between what are often described as the "good" mosquito and the "bad." Mimicry, so common in a variety of insect species, is technologized as an elegant intervention in mosquito reproductive biology. I explore themes of mimicry, doubling, and betrayal as an entry point into the atmosphere of unease I experienced during fieldwork. This work as conducted during the height of the Zika crisis, in which concerns over birth abnormalities associated with maternal infection had elevated the virus to a pressing global security threat. Pregnant women especially reported constant fear. Because the virus is known to spread both between humans and mosquitoes, and between humans and other humans in the act of sexual intercourse, danger appeared both omnipresent and terrifyingly opaque.

The Good One and the Bad: Unsettling Doubles and Problems of Distinction

My ethnographic fieldwork was conducted in 2016 in Piracicaba, Brazil where this new mosquito is in increasingly widespread use. Produced by the British company Oxitec, the mosquito known as OX513A or *Aedes do bem* translates roughly to 'the good Aedes.' Compared to "traditional" methods which involves locating and neutralizing mosquito breeding sites, this program can use transgenic males not only to locate fertile, and potentially disease-bearing females (only females bite humans, to nourish their eggs with blood), but also eliminate their offspring by passing on delayed lethality. This technique has some similarities with other kinds of "Judas animals" mobilized to target their conspecifics.

In the Galapagos, for example, invasive feral goats are located and then shot by helicopter after affixing one goat with a tracking device. A similar technique has been used to cull raccoon dogs in Sweden, and the term 'Judas' comes originally from goats trained to lead sheep or other cattle to the slaughter. It is the cooptation of animal sociality that links these various techniques for killing. In the

case of *Aedes do bem*, the Judas logic is intensified—the program works because wild-type females are unable to distinguish transgenic males from 'natural' ones. Judases do not need to make their conspecifics visible for human eradication—the labor of killing can be outsourced to their genetic modification.

Rather than disentangling humans and mosquitoes by reducing points of contact, this new approach involves temporarily increasing contact and interaction because thousands of males are introduced into "treated" areas. Transgenic vector control strategies depend on more than technological innovation. Human behavior needs to change as well, and for community engagement specialists this means teaching people to see and think differently about the insects they live with. Reducing mosquitoes in the future requires new ways of interacting. For example, both Oxitec employees and community members reported protecting or caring for *Aedes aegypti* mosquitoes in treated areas because they, like the fertile females, were unable to tell the difference between the "good" and the "bad" ones. People reported a hesitation to kill mosquitoes based on an understanding that any individual mosquito may be a transgenic male whose survival would, in the long term, reduce the total population. Laboratory and release workers also had to learn the insect's preferences and needs, accreting a somatic know-how which allowed them to best foster their undercover agents.

In delegating the task of killing mosquitoes to their own reproductive processes, humans insert themselves into the genome of the insect. This intervention is manifested in changed reproductive outcomes. It is thus of great importance for workers in rearing facilities to raise the most sexually competitive males. Death and reproduction here appear as indistinct in a program dependent on reproductive processes for population suppression. Fecundity is crucial to the mosquitoes' lethality. Intergenerational courses of action which are reproductive in "natural" circumstances are repurposed as the transmission of heritable premature mortality.

In Brazil, Oxitec has produced a video to explain their method using two cartoon mosquitoes. The female, larger, berates and belittles her wimpy male mate. In a rasping, lascivious voice, she insists that she would not mate with a transgenic male because she would be able to distinguish him—they can't catch her! She finishes this pronouncement by flying off in a rage, not followed by her mate, "Ade," who makes a sly wink at the camera. Little does she know (*Dengue Fever* 2012).

Dengue fever and *Aedes aegypti* mosquito
Oxitec Ltd., 2012

(Saint) Judas as Savior and Betrayer

On an unusually cold and rainy Wednesday morning, my translator João and I set off to join two Oxitec employees, José and Valdeir, in releasing transgenic males through the neighborhood of Sao Judas in Piracicaba. Using a specialized GPS on the dashboard, Valdeir watches a blue dot representing us and, when it overlaps with a red dot, he quickly removes the lid of one of the clear plastic tubs stacked in the back of the van and coaxes its inhabitants into the gentle current of a propeller-free Dyson fan fitted into a side window with duct tape. A few taps between the side of the tub and the fan gets most of the stragglers out, but some of the insects are still reluctant, huddling in a clump in the bottom of the plastic cylinder and refusing to venture into the rain. Valdier explains that they are lethargic in the cold. When it's hot, he adds, "we have to turn on the air conditioning. They get too excited." Today it's the opposite, and Valdeir leans in to the chute to blow the recalcitrant clumps out. Like many people educated about the project, Jose and Valdier explain to me how they instruct people to protect the *Aedes aegypti*. "We tell other people not to kill the mosquito because who knows? He might be one of the good ones."

The rain intensifies and we pull over to wait it out. How much rain is too much rain, I ask? Valdier says you get a feel for it. He knows they can't fly when it's coming down like this, but he doesn't think that anybody knows how well a mosquito flies in a drizzle, or the chances of a transgenic male surviving long enough to get very far. Valdier elaborates on other things we don't know: is 50 meters the right distance? How well do the mosquitoes fare in commercial areas compared with residential neighborhoods? Passing a bar on the main street, Valdeir says "maybe he gets a little drunk and doesn't fly so well. Who knows?"

Author releasing mosquitos, 2016

At the end of the release, six tubs of mosquitoes are reserved for a 'control' test to be turned into data back at Oxitec's research center. Each man takes three tubs and walks in opposite directions. João and I follow Valdier, who has slipped the stacked tubs inside the front of his jacket. He swaddles them, pulling the tub close to his body heat, which he knows will energize them. The protocol of the control is that each man opens a container and stands with it for ten seconds before replacing the lid (no banging or blowing). Back at the lab, workers will count the number of insects who died or did not fly out of the tub to monitor the health and fitness of the day's release. Valdier knows that today isn't a good day for *Aedes do bem*: it's too cold and too wet. But heating them up in this way, he explains, will help them do better. The inhabitants of the first tub fly out with more alacrity than we had seen so far that day, but by the third, which had been waiting on the cold ground as Valdeir conducted the first two controls, a significant number remained. Dead or just sluggish, they would be sent back. Back in the van, Valdier stacks the empty tubs into the crates, removes the fan from the window, and plugs in an electric swatter. The van smells like burning hair as he casually kills the stragglers.

Later, as João and I drive for coffee, I mention it's funny name, Sao Judas. There isn't a Saint Judas, is there? "I guess it's the good one" he answers me. We continue the discussion in his office on the University of Sao Paulo campus. I wanted to

know what he meant: the good Judas? This turned out to be a language issue. Early translators of the New Testament seeking to distinguish Judas Thaddaeus from Judas Iscariot re-named the former Jude. This name change holds in English and in French, but in Portuguese, as in many other languages, he remains Judas, just the "good" one. He is the patron saint of lost causes and desperate cases.

Judas (the bad one) betrayed Jesus with a kiss, marking him for death with a gesture of intimacy and friendship. In *Judas: A Biography*, Susan Gubar narrates the evolution of Judas as a religious and cultural figure throughout history, focusing on the "diabolical transgressions" his name has come to represent: Christian/Jew; living/dead; human/animal; male/female; fraternal/aggressive; filial/sexual. Judas here is the "bogeyman of the border police," guarding and renewing vital distinctions. "Good and evil, loyalty and treachery, belonging and exclusion get worked out through the figure of Judas" (Gubar 2009, 38). Judas works at the dividing line of self and other, kin and outsiders. His figurative capacity to modulate these binaries can be read as a potential for redistributing life and death. Central to this threat is the spectre of miscegenation. Blurring the boundaries between person and animal, human and satanic, the living and the dead, Judas represents a quite particular fear of indistinguishability and betrayal.

Historically, Judas has had many incarnations. In early Christian texts he appears as a gruesome figure, shamefully revealing a body which is unclean, in pain, and grotesquely sexual (sometimes transsexual). The author of the medieval 'Golden Legend' imagines his early life, which includes killing his father and marrying his mother. An early legend written in Arabic describes an infant Judas obsessively biting himself. His racialized portrayals often carry representations of sexual deviancy, disease, incest, self-harm, anti-Semitism, and rabidity.

St. Augustine attended to the vital role of Judas in delivering up Jesus to the death that was necessary to save humanity, damning himself not just to death, but to hell for this act of redemption. "Delivering up was done by the Father, delivering up was done by the Son, delivering up was done by Judas; one thing was done" (Augustine). Jorge Luis Borges wrote a short story in 1944 titled "Three versions of Judas" about a fictional theologian, Nils Runeberg, who writes three versions of a fiery treatise on Judas Iscariot, claiming that Judas in fact made the greatest sacrifice, potentially greater than Christ himself: he mortified not only the flesh, but the soul, sacrificing his own chance at redemption with the betrayal that re-

deemed humanity's sins. Throughout, parallels between the figures of Judas and Jesus are emphasized: "As below, so above; the forms of earth correspond to the forms of heaven; the blotches of the skin are a map of the incorruptible constellations; Judas is somehow a reflection of Jesus" (Borges 1998, 88).

Captivating Mimicry in Insect Morphology

In his essay "Mimicry and Legendary Psychasthenia," Roger Callois (1935) describes insects which mimic elements of their environments for reasons not immediately discernible to people. This mimicry he describes as a dangerous luxury, evidence of a wasteful and excessive nature overflowing with feral fecundity and senseless death. It indicates, he suggests, a powerful creative force devoid of sovereign ego or intentional design. The insect which takes the form of a leaf, a predator, or a pair of eyes is displaced in its spatial perception, possessed by its environment, trapped in its own incantation. This "attraction by space" blurs the lines between organism and milieu and reflects a wanton superabundance and superfluity of life overflowing species boundaries. The insect, captured and captivated, is displaced by the perspective of another—it is neither fully itself nor truly the object of its mimicry. The organism is depersonalized by its assimilation into space, a loss likened to the experience of darkness, which "touches the individual directly, envelops him, penetrates him, and even passes through him" (Callois 1935, 100). Parikka likewise describes insect mimicry as:

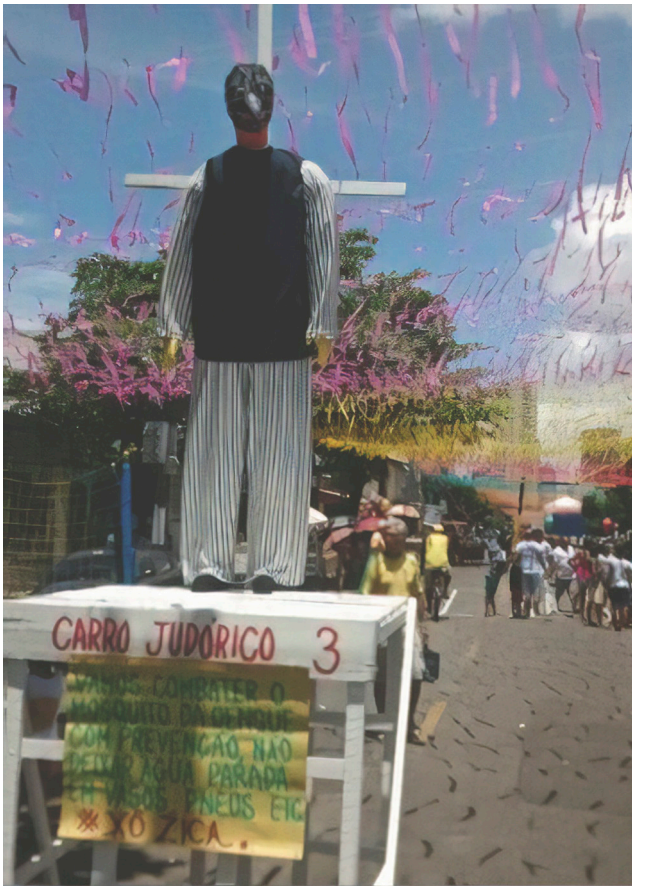
> a passage or a vector that shows that all nature is connected, that there is a layer of Intensity that characterizes all of the expressions of nature. Insects are expressive not only of their specific genealogical record and evolution but of a much broader field of nature….It is as if insects were a microcosmical doubling of other animals, a kind of intensification of potentials of life (Parikka 2010, 4).

As the microcosmical doubling of the good and the bad, *Aedes* is fractally reflected in the mirrored morphology of Jesus and Judas. The frightening element is that this mimicry of form is not coupled with identification. Rather, simulation conceals dissimulation. The becoming-other of the doubled bodily form signals a deeply ambivalent intimacy, a simultaneous indistinguishability and conflict. The penetration and expansion elicited by the obscurity of darkness is recalled in the loss of discernment between organism and milieu produced by associations of correspondence and resemblance. The mutating plasticity of insect forms, coopting the images of their environments, engender fears of a senseless, anarchical force of life, survival, reproduction, and sex. The intensive sexual connections

produced by the penetration of human design into insect sex and reproduction raise similar fears as Callois' permeating darkness. In this penetrative intensity and proliferation of corresponding forms, how does one identify an enemy?

Locating the Enemy

It is customary in many parts of Brazil to burn, hang, or otherwise collectively destroy an effigy of Judas around Eastertime 1. Amused by my sudden preoccupation with Judas Iscariot, João mentioned to me that this year he had heard of some towns making their effigies with the face or body of *Aedes aegypti* (Globo 2016). This was at the height of the Zika crisis. No one knew how many people carried the virus. Because it can spread by *Aedes aegypti* or by sexual contact between humans, it was additionally unclear how to identify and avoid threats of infection. Zika's unique pattern of transmission extends this element of doubt across potential human and non-human carriers. You can be infected with Zika by an *Aedes aegypti* mosquito, but you can also be infected by an intimate sexual partner. Because 80% of the people who are infected with the virus never show symptoms, human carriers are not much more distinguishable than insect vectors. Within the private sphere in Piracicaba, both lovers and insects can penetrate and infect. The Minister of Health admitted to me in an interview that the extent of the spread was entirely unclear, with extremely limited access to testing and wildly ranging



Judas effigy with the face of the mosquito, nd.

estimates—some speculated as much as 80% of the population may have been carrying the virus (P. Mello 2016, personal communication, September 5). This was terrifying for many pregnant women who feared the attendant birth defects associated with infection. Hence, living in areas treated with *Aedes do bem* was believed to be especially important for these women.

Much work has focused on the ways that comparisons to insects have been used to devalue human life, or to demarcate racialized bodies as diseased, dangerous, or killable. Something related but different was happening in these towns. Rather than humans being cast as insects, *Aedes aegypti* was likened to Judas. The Judas/*Aedes aegypti* effigies were "killed" as a collective enemy. Creating a more size-matched experience of violence allowed the "enemy" to be identified and destroyed. Making visible an indistinguishable enemy strengthened commitments to appropriate modes of interspecies sociality by reinforcing affects of loathing. Learning to recognize and hate the enemy also provided a ritualized experience of cathartic expulsion. Because *Aedes aegypti* is so sneaky and stealthy, reproducing in tiny bodies of water (discarded bottle caps, toys left out in the rain, the tray that catches water beneath a potted plant), traditional population suppression strategies require strict vigilance on the part of the average citizen: she needs to know where the insect breeds and how to eliminate opportunities for reproduction in and around her home.

The contention of Oxitec in Piracicaba was that this strategy is too laborious. The mosquito is too intimate with us, too deep inside our homes. We cannot distinguish its spaces of reproduction reliably enough to separate and protect ourselves. We need the transgenic males to do that for us.

The Judas Breed Survives

In 1997, Guillermo del Toro released a film adaptation of Wollheim's short story titled *Mimic*. In 1990s New York, a deadly epidemic of "Strickler's disease," spread by cockroaches living in the dark recesses of the subway system, is killing the city's children at an alarming rate. Susan, a sexy young female entomologist, is called upon by the Mayor to stop the scourge. She designs a transgenic version of the cockroach called the "Judas breed" to suppress the population and stop it from spreading the disease between humans. Inverse of *Aedes do bem*, only females are released. They bear a genetic alteration which speeds the creatures' metabolisms, causing them to starve themselves and thus, theoretically, to persist for only one generation after passing on this lethality to their offspring. Her work appears

successful: the epidemic stops and thousands of children are saved. Three years pass, and we see Susan newly married to her colleague Peter. The young couple fight over sex, however, and Susan is identified as sexually cold. Accusations are made that bugs "peel her banana." Peter offers Susan hormones to make her more interested in sex, but Susan uses them on her crickets instead and we watch her as she, transfixed, observes its effects on them.

Suddenly, a Reverend is dragged underground into the subway system by mysterious assailants. Shortly thereafter, some children tell Susan about a "weird bug" they found, which she realizes is an offspring of the Judas breed—an offspring which should not have survived. In a terrifying inversion of lab and field, her workspace is invaded by a fully-grown Judas, the size and shape of a human being, who comes to steal back her young. Susan turns, horrified, to her old entomology professor: "but it worked in the lab!" "This isn't the lab!" he responds. "You let these things out into the world!" Rather than die, the Judas breed appears to have reproduced faster and larger than normal cockroaches as a result of their mutation. They have also evolved quasi-human forms, allowing them to pass undercover amongst people. This inversion of the logic of the Judas animal, driven by an unstoppable "natural" drive to survive, sees transgenic insects masquerading as humans to target *our* young.

A series of abductions and botched rescues ensue. Peter and Susan find themselves deep in the subway system, accessed through an eerie abandoned Catholic church. They must avoid being killed by the Judas breed (which resemble large humans dressed in black cloaks), while finding and killing the one fertile male with whom they are breeding. Because the breed senses with smell, Peter and Susan smear themselves with the secretions of a dead Judas to pass undetected among them. Lubricated with these slimy secretions, they kiss in a moment of sexual intimacy. Like Susan's Judas breed, *Aedes do bem*, and other Judas animals, this is an interspecies sexual experience, where the reproduction of one species is penetrated by the bodies and interventions of another. Subsequently, they succeed in killing the fertile male, risking both of their lives to save the baby they have learned that Susan is carrying.

While themes of gender and species masquerade are carried through from Wollheim's original short story, del Toro's adaptation pushes further on the eroticism of emergent horizontal sexual networks. Both humans' and insects' sex and arousal

are conditioned by each other's, and both fight to protect the reproduction of their own species, even as this reproduction becomes more deeply imbued with a disturbing eroticism. The film, moreover, begins with the premise of a purposefully engineered Judas breed, asking audiences to consider not only the possibility of astounding insect plasticity, but the potential for human technologization of insect sex to backfire. The mimicry of the insect world is coopted, but not quite controlled.

Del Toro's film, like Wollheim's story, is deeply uncanny. It works on the fear of misrecognition—what poses as human may not be. Humans may be betrayed by their own undercover agents. Humans and insects penetrate each other's bodies, transferring fluids and risks and transgressing species-boundaries in ways that are sensual, disgusting, exciting, and perverse. As with other Judas animals which betray their mates, the Judas breed was intended to work from within, exploiting a modified ferality to cull its own numbers. In this horror story, modulations of an inherently feral sexuality, the power of life to evolve and persist, spin out of human control to create a reversal of this dynamic. It is the insects which learn to operate disguised within humanity. The human capacity to enter insect bodies, to condition their arousal and to make bodies' capacities for reproduction work against them is here suggested to work both ways. *Aedes do bem* and the Judas breed (as Judas creatures) destroy their own young with an unwitting genetic inheritance. Strickler's disease strikes human young, bringing death to the realm of reproduction, where modulations of killing and birth appear fluid across species networks opened by sexual mutuality. As with Borges' reading of Judas Iscariot, there are two faces to the betrayer: The 'good one' and the bad appear as versions of the other.

One could trace a pattern of doubling here: *Aedes aegypti* and *Aedes do bem*, Judas and Jesus, insect and human. *Aedes do bem* is a doppleganger of *Aedes aegypti*. Indistinguishable by sight, its effectiveness in population suppression depends on a female mosquito being unable to tell the difference between her mate and his death-bearing twin. The Judas mosquito works to betray its fellows by being, at once, one of them and an outsider. It poses dangers to *Aedes aegypti* the same way the wild-type mosquito poses dangers to people: by being within the house or family, by being domesticated, intimate, companionable, and hidden. Vector control programs which introduce insects into human spaces rather than remove them depend not on avoiding, but on repurposing closeness, touch, and sexual penetration in both human and mosquito populations.

The Nightmare of Fecundity

Aedes aegypti are entirely dependent on people for their habitats and, because they feed on human blood to nourish eggs, their reproduction. They are drawn to the warmth and smell of human flesh, and to darkness. These facts about the insect are not only known in laboratories and control tests, but in warm skin, swaddled jackets, goosebumped flesh, and shudders. The work of understanding this new transgenic organism can happen in the scientific spaces of research facilities, where workers learn by painstaking trial-and-error what kinds of goat blood or fish meal grow the largest male larvae. It also happens in private homes newly shared with "good" mosquitoes along with "bad." In transitioning to a transgenic system of vector control, people drew upon language and images to process this new logic of interspecies interaction. Posing the mosquito as Judas Iscariot helped to make sense of the transgenic mosquito, but also amplified fears of interspecies betrayal. Fictional accounts like *Mimic* draw on existing cultural imagery to process fears of things that lurk *inside the hous*e. Things which are inextricably intimate and yet, in many ways, deeply inaccessible. One might think of Hugh Raffles' section in *Insectopedia* on the nightmarish aspects of insects:

> There is the nightmare of fecundity and the nightmare of the multitude. There is the nightmare of uncontrolled bodies and the nightmare of inside our bodies and all over our bodies. There is the nightmare of unguarded orifices and the nightmare of vulnerable places. There is the nightmare of foreign bodies in our bloodstream and the nightmare of foreign bodies in our ears and our eyes and under the surface of our skin (2016, 655).

Added to these deep insect fears is that of interspecies masquerade. Articulating the mosquito as a kind of Judas helps us to think with this strategy, but also raises fears of betrayal mutating out of human control. Through the stories linked together here by Judas, we have re-workings of the problem posed by distinguishing that which we cannot viably differentiate: the difference between humans and cockroaches, wild and genetically engineered insects, and protectors and infectors. This new story of vector control is one in which threat and security take indistinguishable forms. Dark, warm, and cryptic spaces, with all their associations of uncleanliness, disorder, and perversion are at once sites of dangerous and unwanted flourishing and of the protection against them (this same reproduction, repurposed). The meanings of these dark spaces become highly ambivalent—both the creepy abandoned subway lines of *Mimic* and the warm swaddling inside Valdeir's jacket. Fears concerning out-of-control sex and reproduction are not

limited to science fiction. A recent paper has published data suggesting that the Oxitec mosquitoes in Brazil have, counter to expectations, apparently mated with wild-type mosquitoes to produce viable hybrid offspring. Why these offspring have not died remains unclear (Evans 2019).

This permeating darkness and the plasticity of sex, intimacy, and disease between species taps into anxieties of blurred or indistinct boundaries between human and insect. Because the technology works directly upon insect reproduction and has been deployed in the context of widespread panic over the Zika virus which travels through and between human and insect sexual and blood contact, the perverse eroticism of the Judas breed has a particularly apt resonance. The sex lives of the human leads are intimately entangled with those of the mutant mimic cockroaches, and their erotic connection is affirmed as they smear each other in the sloppy secretions of the insects they aim to kill. This voluptuous carnality emerges in the violent interstices between very different kinds of bodies which appear in certain encounters uncannily indistinguishable, alternately mimicking and preying upon each other. It is the mutuality of such eroticism, penetration, and deception which grounds many fears of new genetic strategies of vector control.

Exploring how the new transgenic insect emerges with and as the figure of Judas, this paper aims to shed light on the significance of affective encounters in the coming-into-being of a new technology. The fecundity coopted in transgenic vector control strategies were observed to raise unsettling concerns about uncontrolled mutation. This uncanny double potentiality is captured in the image of Judas, doubled himself, who can be cast as both savior and betrayer. This biblical figure brings to the fore uncomfortable questions of distinction—he is said to betray Jesus with a kiss, but his image is also coopted in Brazilian ceremonies to make the *Aedes aegypti* mosquito more visible as an enemy to public health. Themes of distinction, mimicry, and betrayal are important elements in the roll-out of new vector control programs and in the evolution of new interspecies socialities that emerge around them.

Endnotes

1. This refers to 2016, the Easter which had passed a few months before this conversation in August

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