

Distributed Suffering

Animal Experiments, Speculative Modeling, and Their Effects

In the opening pages of James Tiptree Jr.'s 1976 story "The Psychologist Who Wouldn't Do Awful Things to Rats," the central character, Tilman Lipsitz, walks through an animal laboratory on his way to his workstation. Tiptree renders this scene in excruciating detail:

He squeezes past a pile of galvanized Skinner boxes and sees Smith at the sinks, engaged in cutting off the heads of infant rats. Piercing squeals; the headless body is flipped onto a wet furry pile on a hunk of newspaper. In the holding cage beside Smith the baby rats shiver in a heap, occasionally thrusting up a delicate muzzle and then burrowing convulsively under their friends, seeking to shut out Smith. They have previously been selectively shocked, starved, subjected to air blasts and plunged into ice water; Smith is about to search the corpses for appropriate neuroglandular effects of stress. He'll find them, undoubtedly.¹

As the story continues, Lipsitz passes experiment after animal experiment, cataloguing the horrors as he goes. Lipsitz's own research is undirected, and he is silently revolted by his colleagues' work, but he still pursues comparative psychology. As he explains, he will never grow out of the "thrill" of "the act of putting a real question to Life. And watching, reverently, excited out of his skin as Life condescends to tell him yes or no."² Torn between the desire to engage and the deadly means of engagement proscribed by his field, Lipsitz is a wretched figure. In a sudden turn to fantasy, he finds his misery relieved one night by the apparition of the mythical Rat King. Composed of the squirming bodies of the lab's many test subjects, the Rat King leads Lipsitz's soul and the lab animals away to a mysterious elsewhere, free from the expectations and cruelties of the lab. In a final twist, a soulless version of Lipsitz remains behind. This new Lipsitz no longer has the

same qualms and doubts about animal research and happily returns to the bloody business of his experimental psychology lab.

As the psychologist Alan Elms chronicles, the premise for this story was based on the real research and experiences of Alice B. Sheldon, who wrote under the Tip-tree pseudonym.³ Sheldon received a PhD in psychology at George Washington University, and Lipsitz's fictionalized research is premised on her own dissertation. Like Lipsitz, Sheldon was deeply alienated as a psychologist and finally left the profession, becoming an essential writer of science fiction in the mid-twentieth century. In "The Psychologist Who Wouldn't Do Awful Things to Rats," she returned to her earlier career, rearticulating the lab as a space of emotional complexity and desire and thus revealing a muddled terrain in which inflicting pain is often suffused with interest and care. In this brief story, the Rat King—who whisks away both the animals' suffering and the experimenter's conscience—serves as a potent metaphor of how both pain and care are repressed within the lab. Here, "scientific objectivity" is not produced through rigorous training and self-control but rather through a deeply emotional experience, even a spiritual one, of repression, which radically transforms all of the participants in the lab by removing essential components of their being. The Rat King, in all of its mythological, corporeal, and emotional registers, represents the laboratory's return of the repressed—a visceral manifestation of the lab's rejected emotional entanglements.

Donna Haraway similarly theorizes the experimental laboratory in her 2008 book, *When Species Meet*, where she confronts the arguments of both practitioners and critics of animal research.⁴ In place of any airtight reasoning for either condemning or exonerating laboratory research, Haraway proposes a framework of "shared suffering." Seeing laboratory work as shared suffering requires an ongoing investigation of ethics, one that never satisfactorily lands on a single safe ground or innocent position from which to declare this or that act entirely justified in the calculus of total moral good. Her argument is premised on a recognition of animal agency in the lab, a space where labor is performed on all sides, as animals, apparatuses, and scientists all respond to each other. Part of the challenge then is to not look away from the ethical calculations—the crude cost-benefit evaluations of pain and death caused and avoided by each given experiment—while simultaneously recognizing that these calculations are never enough and that in the face of such instrumentality, animals remain participants in the lab, despite being severely restrained, or worse. As Vinciane Despret claims, animal laboratory work is less a matter of using animals as if they were inert tools than a process of "attunement" with bodies that are allowed more or less ability to respond.⁵

In this chapter, I use "shared suffering" not only as an ethical guidepost but also as a methodological tool for analyzing and understanding celluloid specimens, focusing in particular on rat films like *Motivation and Reward in Learning*. Doing so allows one to read these films as contested outcomes of messy human/animal

interactions rather than as polished scientific models completely abstracted from the animals themselves. Here, celluloid specimens themselves continue the affective experience of the experiment beyond its completion. I argue that the shared suffering thus stretches out beyond the borders of the experimental laboratory through the institutions, such as film, that distribute its findings and images—thereby embroiling scientists, spectators, urban planners, and city residents in the affectively dense suffering of laboratory animals.

Historians of science and scholars in science and technology studies usually approach animal models as epistemic tools, emphasizing the influence of human scientists rather than the agency of the animal test subjects. As Nicole Nelson writes, “The human-centered affordances of constructionist metaphors have done important work for STS in counteracting realist epistemologies that claim that the scientific method simply lets nature speak.”⁶ As we saw in the previous chapter, this strategic approach is essential, allowing scholars to identify the ways in which films like *Motivation and Reward in Learning* use rats to achieve the aims of their scientific filmmakers. But shared suffering opens these same films to disavowed, yet important, affective components that are otherwise lost to analysis. It is here that their true strangeness emerges, not simply as statements of scientific fact, political ambition, or ideological commitments but also as documents of real human and nonhuman emotional interactions, yearnings, and desires, which intertwine with the research objectives of the filmmakers. Perhaps more than any other medium, films of animal research retain traces of the shared suffering of the lab. These images visualize their human creators’ grand aspirations for shaping the future, while also viscerally recording the suffering of the lab animals who labored to produce such speculative projections. As a methodological framework, the concept of shared suffering alerts us to these conflicting aspects in laboratory films, demanding that we perform against-the-grain readings to unearth emotions that are all too often suppressed by the films’ structure and editing.

Rat films like *Motivation and Reward in Learning* made up a veritable standalone genre of rodent behavior films dedicated to speculative projections about human history and behavior.⁷ The first section focuses primarily on two of these completed films, *An Experimentally Produced “Social Problem” in Rats* (1939) and *Competition and Dominance Hierarchies in Rats* (1940), both made by one of Miller’s colleagues at the Institute of Human Relations, O. H. Mowrer. We will see how the shared suffering of Mowrer’s lab, where his own emotional struggles were deeply wrapped up in his experiments, were imprinted in the films that he made, inviting audiences to engage in a similarly fraught relationship with the animals onscreen. The second section examines a science fiction variation of the lab-rat film, focusing on the uncut footage shot by the behavioral ethologist John B. Calhoun, who built futuristic model cities populated with rats. Here we will see how the rats in Calhoun’s film were made to mirror the position of the city dwellers whose lives would eventually be shaped by these experiments. In the final section,

we turn to Joyce Wieland's experimental intervention into the lab-rat genre, *Rat Life and Diet in North America* (1968), which commandeers the scientific rhetoric of the rat film to counter the society of control that films such as Calhoun's were often intended to create. This section provides a counterexample to that of Calhoun, detailing a different, liberatory model of shared suffering coming out of feminist experimental film and science fiction, one whose goals differed significantly from those of the behaviorists. Cumulatively, these three examples—the exactly edited films of Mowrer, the uncut footage of Calhoun, and the experimental film of Wieland—demonstrate variable uses of film and animals in the creation of their images, a pursuit that could either embrace animal alterity or obfuscate it. Each filmmaker and set of films represents a different type of “shared suffering” with their rodent subjects, which in turn leads to very different visions of society.

SHARED SUFFERING ONSCREEN: EMOTIONAL INVESTMENT IN THE FILMS OF O. H. MOWRER

Orval Hobart Mowrer's behavioral laboratory was saturated with shared suffering—a space where political forces, psychological obsessions, and animal behaviors commingled. Historian of science Rebecca Lemov describes Mowrer's midcentury rat experiments as “a kind of autobiography,” in which Mowrer reenacted his own psychological anguish on his rodent test subjects.⁸ As a teen, Mowrer began suffering from a deep depression and feelings of unreality, which he later attributed to what he describes as a secret “sexual perversion,” the details of which he never fully disclosed.⁹ Whatever he meant by this phrase, it seems clear that Mowrer thought of himself for much of his life as an outsider, a position that pained him profoundly and indirectly influenced his work. In his later writing, Mowrer described the period of his life working with animals as wracked by intense bouts of alienation, anxiety, and depression—the very emotions he was simulating and testing in the lab. Drawing from his own accounts, Lemov concludes that Mowrer's experiments were his attempt to physically manifest his own internal demons and thereby control them as he controlled the behavior of the rats.

Most of this work was conducted alongside Miller at Yale's Institute of Human Relations (IHR). After graduating from Johns Hopkins with a doctorate in psychology in 1932, Mowrer eventually secured a full-time position in the psychology department at Yale University and as a research associate in the IHR.¹⁰ While there, he participated in the IHR's collective research of integrating Freudian psychoanalysis with behaviorism (discussed at length in the previous chapter). One result of this work was a comprehensive, though speculative, theory that connected experimental research with the feelings, emotions, and behaviors of human populations on a variety of scales, a theory that became widely known as the “frustration-aggression” hypothesis. Simply put, the frustration-aggression

hypothesis argues that behavior is caused by drives or desires that are either fulfilled or thwarted by the circumstances in which an organism finds itself and that this dynamic can be measured in the lab. Mowrer helped develop these theories as a coauthor of *Frustration and Aggression* (1939), where the IHR researchers collectively outlined their work.¹¹

An important subsection of *Frustration and Aggression* focuses on extending behavioral psychology as an explanation of Marx's laws of economics. Here, the "frustration-aggression" hypothesis is applied to Marx and Engel's description of the formation of class in *The Communist Manifesto*. The authors argue that Marx's materialist interpretation of history "introduced unwittingly a psychological system" that mirrors their own.¹² They thereby reframe Marx's description of primitive accumulation through the lens of behavioral psychology. In the version proposed by IHR researchers, the spiraling tendencies of class conflict begin with an almost mythic moment of initial, individual frustration, when the worker discovers his or her confined role within the instruments of production.

Mowrer studied the emotional effects of this process, a pursuit that Lemov argues was rooted in his experiences of depression and alienation. In his laboratory work, Mowrer claimed to simulate anxiety in rodents by regularly shocking them with electric currents. In a series of articles, he outlined the debilitating effects of anxiety on rats as they wait for these shocks to occur and the surprising reduction in tension when the shock was actually administered. He used these findings to construct an extensive explanation for human behaviors, especially those of marginalized and oppressed classes of people. In his chapter of *Frustration and Aggression*, Mowrer argues that crime is caused by a disparity between an idealized American lifestyle (which he notes is mostly propagated by advertising and film) and the actual material circumstances confining groups of people.¹³ As historian Corbin Page says, Mowrer claimed that "African Americans, Native Americans, poor people, people with less education, shorter people, young people, less attractive people, people with physical disabilities, children of single parents, unmarried people, divorcees, and so on were all more likely to be criminal" because of the restrictions of society.¹⁴ In Mowrer's description, these criminalized groups deviate from "normal" life, where frustration is channeled toward legal and acceptable pursuits. Here, criminalized underclasses of oppressed people are created through primary moments of frustration and confinement, which then leads them to a variety of antisocial pathologies and behaviors.

Mowrer not only theorized this dynamic but also set out to simulate and film its occurrence. In *An Experimentally Produced "Social Problem" in Rats and Competition and Dominance Hierarchies in Rats*, he sought to use film to record social interactions and their effects on individual psychology. Mowrer's films are concerned primarily with the process of individuation. Hierarchies of behavior are produced in groups of rats over multiple experimental interventions, and the films focus on the development of these group dynamics. Although they occasionally



VIDEO 5. *Competition and Dominance Hierarchies in Rats*
(O. H. Mowrer, 1940).
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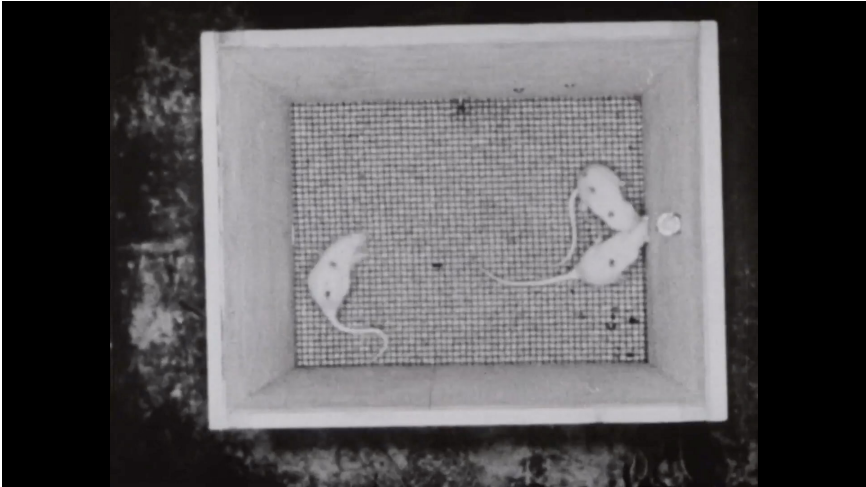
title and individualize single rats, the animal subjects are always presented as members of a group rather than as a single (yet universal) example in the way that animal subjects function in many other research films—for example, in *Motivation and Reward in Learning*. Over the course of the films, these rats are meant to model the development of behavioral patterns of particular classes in society.

Mowrer's films present some of the complex, messy, and often contradictory affects that make up shared suffering in the lab. The differences in arrangement and conceit in each film are significant, despite Mowrer's claiming to study the same process and often screening his films in the same settings. The testing apparatus depicted in *Competition and Dominance Hierarchies in Rats* is relatively simple, consisting mostly of a glass jar that is used to confine the rats in a tight yet visually accessible space. A distinct hierarchy emerges in the behavior of the rats over repeated trials presented in the film. As the title cards explain, the rats begin with an active and exploratory pursuit of food, as a rat with a pellet persistently turns its back on two others, who are trying to take it. But as the experiments continue, this chase after the pellet becomes violent. The film's title cards describe this behavior as a second stage in the production of hierarchy, where exploration leads to forceful dominance. The final phase takes place when the rats have learned and internalized their position within the hierarchy. The title cards describe how one rat becomes "dominant," one "intermediary," and the last "subordinate." This change in behavior is most profound in the "subordinate" rat, who has been so affected by the violence associated with the pellet that it will no longer

touch it even when alone in the jar, despite being close to starvation. We are told through the title cards that this change in personality is long-lasting, reemerging in all future experiments. As Mowrer explained in his presentation of the films to the New York Academy of Sciences in 1940, this film demonstrates changes in the subordinate rodent's "personality," as it becomes "shy and restrained," exhibiting a "food neurosis" and a decreased intelligence that has been "depressed by social experience."¹⁵

Given what we know about Mowrer's own experiences of deep depression and anxiety at the time he made this film, its emphasis on the pain felt by its rodent protagonists is striking. Indeed, the way the films position the viewer invites sympathy for the rats even as it disavows it, creating precisely the type of strained, conflicted relationship that defines "shared suffering." The relatively isolated rats, the theoretical framework of "personality typing," and the clear allusions to human culture in the title cards lend these rodents an identifiable interiority that they would not have otherwise. The camera is placed at eye-level with the rats, and the transparency of the experimental apparatus allows for an intimate proximity during their social interactions and in moments of isolation. Finally, the lighting of the film works to isolate the rats in an inky darkness, playing up the contrast between the white coat of the albino rat and the painted black of the matte background.

By presenting the rats on a grand scale that occupies the majority of the screen and creating a narrative of deprivation and conflict, the film depicts moments that, at least to my eye, are deeply poignant, such as when we watch the listless, hesitant, and starving rat that has been forced into the role of subordinate. It is possible that Mowrer felt similarly, as he later described conflicting feelings about these experiments and the relationship they established between him, his emotions, and his animal subjects. The ravages of social violence have immobilized the rat we see onscreen, and its seeming terror at the introduction of the other rats—leaping to the far corner, belly up—was meant to be read within Mowrer's framework as a kind of psychological trauma. Social subordination therefore becomes the film's prime cause of personality formation, as the rat moves from being indistinguishable within the group to a distinct "identity" by adopting a position in relation to the others. Mowrer provides no explanation for why certain rats adopt particular social positions, describing, in true behaviorist fashion, behaviors as emergent from the experimental setting rather than individual rats. Here, poverty is represented as a combination of material substrata and relational dynamics that lead to neurosis. As Mowrer describes them, his films were meant to present simplified, controlled, "habit mechanisms" of living organisms from which human society and language is derived.¹⁶ These were precisely the types of linkages between human society and animal experiments that behaviorist theories such as Mowrer's were built on and ultimately undone by. But, at the time, behaviorist theories of society were ascendant precisely because of their "ability to generate cast-iron laws of behavior in the animal laboratory."¹⁷



VIDEO 6. *An Experimentally Produced "Social Problem" in Rats* (O. H. Mowrer, 1939).

DOI: <https://doi.org/10.1525/luminos.145.6>



Mowrer's *An Experimentally Produced "Social Problem" in Rats* operates in a different register and, intentionally or not, approaches questions of class far more as an issue of design and material arrangement than interpersonal socialization. Key to this shift in framework is the experimental apparatus, which is changed over the course of the film. Depicting the "Skinner method" (more on this in chapter 8), in which the rats are held in an enclosure containing a lever that must be pulled in order to receive food, this film codes the rats' behavior in terms of production and consumption rather than dominance and submission. *An Experimentally Produced "Social Problem" in Rats* begins with the lever and food chute being placed on the same wall. In these early sequences, the rats learn to operate the lever whenever they are hungry, easily satiating themselves by producing more food on command. But in subsequent scenes, the food chute and lever are placed on opposite walls. Now, labor and its product are essentially split. Two classes of rats emerge over time when multiple rats are introduced into the later version of the apparatus. Over the course of four days, the rats go from all working, but never benefiting from their work, to all fighting over a space at the food chute, without any food being produced, to finally a single "worker" who does the vast majority of the labor while rushing back and forth between the lever and the food chute in order to snatch bits of food away from the "dependent" or "parasitical" rats who wait by the chute. As the title card concludes: "A 'class society' has emerged."

The spectatorship position of this film differs starkly from that of *Competition and Dominance Hierarchies in Rats*. The preponderance of the film's footage is

taken above the experimental enclosure, looking down through its open top. The solid walls of the apparatus prohibit camera angles at the rats' level. Instead, we have a schematic vision, akin to an architectural blueprint. Viewed from above, the intense affective interiority of *Competition and Dominance* is gone. Closer tracking shots that occasionally focus on details of specific behaviors—crowding around the food chute, operating the lever itself, and frantically running back and forth between the lever and the chute—sporadically break the uniformity of the film's bird's-eye view. But despite being closer to their subjects, these shots retain the schematic perspective of the wide shots, displaying curiosity more than a sense of pathos. Ultimately, poverty in *An Experimentally Produced "Social Problem" in Rats* is explored less in terms of individual psychology and more as the product of supply and demand, production and distribution. The rats demonstrate the material effects of class organizations beyond the constraints of human society, suggesting a history of organisms that extend beyond traditional nature/culture boundaries. Here, we have a variation on Haraway's "shared suffering" that one might call a "shared struggle," in which animals as well as humans can become part of the proletariat.

In some ways, this type of animal research is the least likely to withstand the scrutiny of an ethical cost-benefit analysis of scientific knowledge gained versus animal suffering caused. It produced hypotheses and fantasies, images of possibilities rather than concrete tools for acting. Mowrer and his peers' central assumption—that rats can in some way stand in for humans—was often flawed or absurd, the worst type of arbitrary reason for causing suffering. Indeed, Haraway finds this type of behavioral modeling, which produces the animal as a substitute for human pain, among the most troubling.¹⁸ There is no denying the troubling power differential between Mowrer, as filmmaker and experimenter, and his rats, which were made to painfully perform the scenes he concocted. But these experiments still raise fascinating, worthwhile questions. For instance, what if we reframe Mowrer's work as a method of abstract, imaginative, and creative thinking that was produced through the shared labor (and suffering) of nonhuman participants? One way of understanding Mowrer's research is to view it as a collaborative process of imagining a collective future and a collective past, with animals participating in the authorship of theoretical histories. As Vinciane Despret argues, rodent experiments such as these are produced through the interaction of expectations on all sides, in which the rats responded to Mowrer's desires as he responded to theirs.¹⁹ These material exchanges lead to a form of "worlding," in Haraway's sense of the term, through the creation of new ways of conceiving history, politics, and futurity. Even if in actuality most of this research into rodent behavior ended up falling short of this potential—functioning as metaphorical props in fantasies of human engineering—there is a strain of productive utopianism here, where animals and humans labor side by side in a process of speculative thinking about living together. Indeed, Mowrer's first film, *Animal Studies in the Social Modification*



VIDEO 7. *Animal Studies in the Social Modification of Organically Motivated Behavior* (O. H. Mowrer, 1937–38).

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of Organically Motivated Behavior (1937–38), offers a glimpse of an idyllic alternative to the pain and trauma of his other two. Like the others, this film features groups of hungry rats placed into an experimental apparatus and given food pellets, but in this instance they are given just enough food to satisfy their hunger and there is no separation of producer and consumer rats.²⁰ Eventually, what develops is a food-sharing system, in which rats can even take the food from each other's mouths without fighting, and each eats its fill. As the film's title cards conclude: "an 'altruistic society' has arisen." But once these rats have access to a private space to bring the food to, fighting commences yet again, now even more fierce.

None of this is meant to justify inflicting pain on animals in the lab. These experiments emphasized suffering more than sharing. Mowrer himself felt trapped and persecuted by the methods and confines of his field. In a well-publicized 1947 speech to the American Association for the Advancement of Science in Chicago, Illinois, he rejected the lack of a moral focus in experimental psychology, advocating for a return to religious and commonplace understandings of guilt and responsibility.²¹ Afterward, he dramatically shifted the focus of his research, emphasizing group therapy based on confessing past sins rather than experimental testing. The implicit shared suffering in his work from the 1930s, which is vividly on display in his films, was ultimately untenable for Mowrer and led him to massively reshape his life. He was deeply unhappy when he was conducting this research and making these films, a fact that lingers over them. And

he was not the only one unhappy. The rats in these films also were desperately searching for an escape from their circumstances. In a lecture given to the New York Academy of Sciences, Mowrer admitted that the rats featured in *An Experimentally Produced "Social Problem"* frequently attempted to escape (to "leave the field of play") by jumping out of the open top of the apparatus through which they were being filmed.²² Scenes of this behavior were edited out, deemed irrelevant at the time. But the desire to escape remains as an invisible presence in the films. These movies are shot through with the frustrated wish for freedom, a yearning to escape the repression and oppression of the lab that emanated from both scientist and rats in a discordant process of attunement. Imprisoned together by the disciplinary rules of behavioral psychology, the confines of the testing apparatus, and the editing of the film, the animal test subjects and the human researcher seem to grope uncertainly, and often painfully, for a better way of being together, one that was more psychologically, personally, and politically humane.

THE FUTURE TENSE: JOHN B. CALHOUN'S RAT CITIES

We watch as a tiny, pink infant rat wriggles on a bed of wood shavings at the bottom of a glass container. It blindly scrunches its body back and forth, clumsily waving its paws in the air. A monotone female voice begins to tell the story of a scientific experiment with rats in a maze, as an electronic popping sound plays at increasing frequency on the soundtrack. Suddenly, from the bottom left corner of the screen, the head of a snake wavers menacingly in and out of frame. The film cuts to another subject leaving audiences with an impending sense of dread. Fragments of this scene are interspersed throughout Theo Anthony's 2016 experimental documentary *Rat Film*, which claims to "[use] the rat—as well as the humans that love them, live with them, and kill them—to explore the history of Baltimore."²³ Peppered throughout the movie, this evocative and disturbing shot of the infant rat eventually culminates in a final image of the snake devouring the rodent baby, a shocking moment even if audiences have been waiting for it throughout the entire film. Jarring and disorienting, Anthony's film weaves in and out of—or rather, smashes together—images of animal experiments, historical city maps, interviews with Baltimore residents (including an oracular exterminator), and a glitched out CGI rendering of the city's streets. Together, these scenes tell a leaky, incomplete story about the history of redlining in Baltimore, a process that led to massive economic and racial disparities. Through the film's dislocated presentation of different settings and shots, a heightened sense of danger is evoked, one that bleeds over from scene to scene.

What is remarkable about the film is the way that onscreen violence enacted on rats carries over to the history of racist city planning in Baltimore. The film seems to suggest that these two types of violence—the testing and extermination of rats, on the one hand, and the abandonment of populations to deep generational

poverty, on the other—are in some ways wrapped up in one another, continuing to reverberate in Baltimore residents' own conflicted relationship with the rats in the city. Crucially, this connection is not built on one simulating the other but rather on the two being subject to the same system of control. Cumulatively, *Rat Film* works to demonstrate how both these rats and Baltimore's citizens have been forced into a tangled web of shared suffering, one in which they are simultaneously at odds with one another and forced to suffer by similar forms of oppression.

A major figure in the film's story is the ethologist and rodent behavioral specialist John B. Calhoun, who used his animal experiments to study the effects of population density and overcrowding. Though not directly linked to the city planning of Baltimore, Calhoun's experiments were conducted at a nearby farm, and the findings from these experiments were broadly used in the 1970s and 1980s to explain the problem of so-called urban blight that cities like Baltimore were said to be suffering. *Rat Film* evokes Calhoun's research as a means of demonstrating the very real connections between laboratory research and its applications in the lives of humans and animals. Viewers learn that Baltimore, in particular, has long been a testing ground for techniques in population management through a combination of pest control and redlining. In the following section, I will extend this claim, arguing that "shared suffering" is not only a useful frame for understanding the interpersonal and interspecies affects of the lab but also for considering these broader applications of findings from animal research. Through a close analysis of the films made by Calhoun, we will see the ways in which the laboratory and the city were made to mirror each other, as well as the very real effects of such reflections. Yet we will also see the ways in which the uncut films from some of Calhoun's research can tell a different story, one in which the easy comparison between human and rat begins to collapse. The less control that Calhoun and his fellow scientific filmmakers exerted over the image of the rat, the less amenable it was to standing in as a model for humans and the more one gets the sense that such a comparison conceals as much as it reveals.

Calhoun's edited and unedited films are archived at the National Institute of Mental Health Library in Bethesda, Maryland.²⁴ Trained as an animal ecologist, Calhoun bridged the study of animals and humans by incorporating the theories of behaviorism into his ecological research of rodents, which he conducted at Johns Hopkins University from 1946 to 1949 and then at the National Institute of Mental Health (NIMH) from 1954 to 1983.²⁵ These experiments led to his breakout concept of the "behavioral sink" to describe the negative effects of overcrowding, an idea that is counted among the most important psychological findings of the twentieth century.²⁶ Calhoun took the rat-film genre's simulative logic to its most extreme, positioning his experiments as prognostications for human futures. Unlike his earlier ecology experiments, he constructed spaces for his work at the NIMH that were increasingly unrecognizable as natural settings. He built a series of structures he titled "rat cities" or "rat utopias," and later even "rat universes,"

which provided populations of rats with all their basic necessities—food, water, a clean environment—except space.²⁷ He conceived of this work as a simulation of the effects of overpopulation on human societies in the near future, an accelerated “worlding” of the future within the controlled setting of the lab. He found that constantly being surrounded by other rats led his test subjects to exhibit increasingly abnormal behavior, which he describes in his written publications as “deviant.”²⁸ Included under this header were homosexuality, hypersexuality, hypermasculinity, passivity, cannibalism, infertility, and a breakdown of maternal care. Like Mowrer, Calhoun claimed to have found the spatial and material roots for a heteronormative definition of human deviancy.

Calhoun reported his findings in his breakout 1962 article in *Scientific American*, “Population Density and Social Pathology,” which brought this research to a broad public audience, who enthusiastically embraced it.²⁹ As Edmund Ramsden and Jon Adams demonstrate, Calhoun’s theories widely impacted conversations about urban planning and decay, influencing popular representations of the city as a hellhole or a dystopia and leading to a broad public conversation over the decline of morality in American cities.³⁰ The behavioral sink was applied to everything from Judge Dredd comic books to readings of the Newark riots, feeding into a ballooning debate over the supposed decline of American cities.³¹ This largely right-wing discourse mobilized the rat as a sign of degraded life in urban filth.

Film was a central component in the experiments themselves, part of what Calhoun called his “close surveillance” of the rodent city dwellers.³² Shot during the three decades that Calhoun worked at the NIMH, the hours of footage created by these experiments constitute a major body of unedited films. These were made solely for internal use in the lab and were never distributed. In them, Calhoun’s initial experiments in the barn give way to exceedingly complex models of urban spaces, including skyscraper-like towers, massive grids and girders, alleyways, hidden corners and great central plazas. Whereas Miller and Mowrer created accessibility for the camera’s lens with removable lids and transparent cages, Calhoun supplements with infrared cameras that track the mice even in the dark. Additionally, he uses zoom lenses to survey the rats from above, ultimately reframing the relationship between individuals and society that is so central to the rat-film genre. Through the zoom lens, the audience is able both to float above the action, watching huddled masses of rats as they cluster together, and to pick out individuals from this mass, whose behavior can be isolated through the constriction of the frame as we move in to focus on a particular behavior. Watching these clips, one moves constantly between individual behaviors and masses of relation—psychological and schematic all in the same breadth. As an embodiment of scientific observation in Calhoun’s lab, the viewer is given access to both an isolated image of single rats displaying particular psychological traits (deviance, obsessiveness, apathy, etc.) and an overarching vision of the effects of spatial design on the population of rats as a group (the huddling in certain corners, the traffic between sectors of the “city,” the coveted location of the high-rises above the masses below).



VIDEO 8. Clip from
John B. Calhoun Film
7.1 [edited], (NIMH,
1970–1972).
DOI: [https://
doi.org/10.1525/
luminos.145.8](https://doi.org/10.1525/luminos.145.8)



Calhoun designed his experimental settings as highly contemporary, even futuristic, urban spaces. Indeed, Calhoun explicitly saw his experiments, and by extension his films, as visions of the future.³³ His written comparisons to human societies to come are direct and unqualified.³⁴ As he described in 1970, his research was “coupling such ideas derived from animal studies with information and insights from the literature on man to seek further insight into man’s possible future.”³⁵ Calhoun thus meant his experiments to be a brand of empirical science fiction, positioning his films as vision of the possible outcomes of particular choices in urban design.

Unlike the popular reading of his work, which often depicted the behavioral sink as an inevitable result of population growth, Calhoun believed human ingenuity could design an escape. In a 1958 televised interview with Bill Roberts for Time-Life Broadcast, he expounded on the power of his rat utopias to serve as laboratories for perfecting future cities. Titling his prescription “Revolution,” Calhoun argued that certain layouts of his experimental apparatus could avoid the “behavioral sink” by designing spaces that encourage innovation and discourage the negative effects of overcrowding. This expansive ambition for a human-led intelligent design is directly on display in a scene from the Time-Life interview, where Calhoun himself steps down into his rat cities. Shattering the sense of scale otherwise maintained by the ongoing allegory of rodent-as-human, this sequence creates a strange bleed-over of registers. The rats and mice are both human and vermin; Calhoun is both man and giant, towering over the inhabitants of his miniaturized city. Here, Calhoun embodies the grand designer whose omnipresent eye is presented by the films’ perspective. Looming over the inhabitants of his constructed city, he appears as an author milling around in his own story, picking up and examining his own characters, guiding and explaining their actions to the cameraperson, altering and transforming their surroundings.

Despite Calhoun’s totalizing ambitions and the ever-present scanning and searching of the camera, the most prominent feature of the hours of footage held

at the National Institute of Mental Health Library in Bethesda is the mass of footage in which the rats seem disconnected or utterly indifferent to Calhoun and his scientific theories. Without the theoretical framework of Calhoun's written treatise, these onscreen rats are not illustrations of concepts but rather opaque subjects. For instance, in the filmed lab notes from January 8, 1981, we view with an infrared camera a set of glowing green rats as they traverse the multiple levels of Calhoun's utopia—stopping to gnaw on metal cords, walking down empty ramps, repeatedly entering and exiting meshed enclosures, and chasing each other back and forth. At times a particular behavior seems to be the focus of the camera, such as when two rats face off at the entrance of one enclosure, a behavior Calhoun often referred to in his published work. But, by-in-large, the shots are meandering and unfocused. Some shots are indecisive or incomplete, lasting mere seconds, as if the behavior the filmmaker wished to record has already ended. At other times, the rats seem about to engage each other—in a contest for space or in pursuit—but then simply stop and wander off in opposite directions. The vast preponderance of this material includes behaviors that Calhoun does not address in his written work or interviews. Like the rats who attempted to escape from Mowrer's experiments, these scenes speak to aspects of the rodent deemed unessential and which were therefore left on the cutting-room floor as Calhoun transformed the rats into stand-ins for hypothetical humans experiencing overpopulation.

“A STORY OF REVOLUTION AND ESCAPE”:
FEMINIST SCIENCE FICTION INTERVENES

“This film is against the corporate military industrial structure of the global village.” So reads the first title card of Joyce Wieland's 1968 film *Rat Life and Diet in North America*. In this film, Wieland, an artist, manages to both caricature and utilize the metaphoric structure of the rat-film genre. In this section I position this film within a practice of feminist science fiction, which has a long history of intervening in scientific spaces, as in the case of Alice Sheldon with which this chapter began. Here, the troubling political implications of work like Mowrer's and Calhoun's is unearthed and recuperated, sent down a different path beyond social management and control.

Rat Life and Diet in North America adopts its form from science filmmaking. Like Mowrer and Miller, Wieland uses title cards to establish a series of scenarios in which the rats perform as allegorical political actors. The film's loose narrative focuses on a group of rats who begin confined in a glass enclosure, where they are overseen by a pair of cats on the other side of the farthest pane. They subsequently escape, and, evoking the draft dodgers of the Vietnam era, flee to Canada, where they take up organic gardening and participate in a cherry festival. Here, Wieland's “rodent flower-children” live an idyllic life of abundance and back-to-nature simplicity in the wilds of Canada until the last seconds of the film, when we learn that the CIA has invaded and presumably reincarcerated the film's heroes.³⁶

The rodents featured in *Rat Life* are in fact gerbils. That Wieland changed their name demonstrates her canniness regarding the scientific and cultural valences of the rat—a symbol of both the crumbling infrastructure of the city and the scientific management of behavior. Beginning with the film's title card, she constantly emphasizes that the political similarity between lab rats and humans is not in their shared "habit mechanisms," as Mowrer describes, but in their shared circumstances as subjects of authoritarian control. At moments, she superimposes the words *political prison* over the image of trapped "rats" while the soundtrack blares the shrill of sirens. In one sequence, she overlays a neon red target on top of the image, which makes the camera's swift attempts to keep the rodent in frame reminiscent of a deadly act of targeting. Here, the film clearly connects the act of filming and the violence of confinement.

Unlike the designed utopia envisioned by Calhoun, Wieland's film is a vision of utopia as a flight from control. As she describes, the film is "a story of revolution and escape."³⁷ Like the feminist science fiction authors of the 1960s and 1970s—such as Tiptree, Ursula K. Le Guin, and Octavia E. Butler—that so inspired Haraway's reading of science's utopian potential, Wieland imagines her utopia as an escape from the excesses of utopian thinking in the work of behavioral engineers and industrial planners, who would micromanage their way to an ideal society. As Raymond Williams writes of this feminist utopian mode, it creates "an open utopia: forced open, after the congealing of ideals, the degeneration of mutuality into conservatism."³⁸

Wieland's film suggests not only an escape to a natural space outside the overdeveloped confines of a military industrial complex but also an escape from the formal aspects of behavioral scientific discourse, *detourning* the common structure of most celluloid specimens. Roughly edited, each cut in the film is a jump cut, jarringly shifting time and space. Wieland's disjunctive editing techniques bring attention to the film's construction as a collection of film clips rather than a transparent window onto the original experiment. Her film is no less edited than those of Miller and Mowrer, but the absent spaces between the shots are more concretely felt in Wieland's iteration, where the ellipses of each cut is abundantly clear.

Furthermore, *Rat Life and Diet in North America* gestures consistently to an offscreen space that eludes the film. Major narrative developments, such as the invasion of Canada by the CIA, are quickly described in a single title with no corresponding images. At times, the allegorical narrative of the film barely holds together, composed of a roughshod assemblage of disparate images, loosely tied together by title cards. At others, the narrative seems to fade into the background, given over to the erratic, inexplicable scurrying of the onscreen rodents. In such moments, the film suggests that the more somber rat films produced in the lab might be similarly unreliable and that Wieland's "flower children" are no less plausible than Calhoun's "deviants."

In Miller's and Mowrer's films, aberrant animal behavior is edited out or discarded as "random." The shared suffering in these films is actively repressed, which

is very common with celluloid specimens. Within the context of scientific filmmaking, one is rarely presented with long stretches of unexplained activity or given open invitation to emotionally respond to what is onscreen. These tightly edited films become like the experiments described by Vinciane Despret, in which the animal is “articulated by the apparatus,” given no choice but to predictably react in pain or shock.³⁹ But when you compare the edited footage of a completed film like *Motivation and Reward in Learning* to the unedited takes by a filmmaker like Calhoun, it becomes clear that rodent performances can be far subtler than they are given credit for—that the majority of their responses to the built environments in the lab are as baffling as they are revelatory.

Given a looser format, animals often opt to tell stories that are drastically at odds with the ones being told about them. One of the striking takeaways of *Rat Life and Diet in North America* is the parallel, yet ultimately *separate*, development of the film’s political allegory and its actual images of animal behavior. Wieland’s title cards inevitably fail to explain what we see onscreen, seeming to speak alongside rather than speak of the animals we observe. This unfastened structure relaxes the narrative’s control over the animals’ signification, allowing them to be opaque, aberrant, and unexplained. As a work of art, it separates the speculative and allegorical function of the rat-film genre from its utilitarian setting, thereby harnessing the powerful narrative capacity of laboratory speculation toward entirely different ends from those of urban planning and human engineering. Wieland thus suggests that there are other possible forms of “putting a real question to Life,” as Alice Sheldon’s Tilman Lipsitz describes, ones that do not involve fantasies of control but rather the desire to build shared futures in an uncertain world.