ANIMAL PRIVACY: Historical and Conceptual approaches

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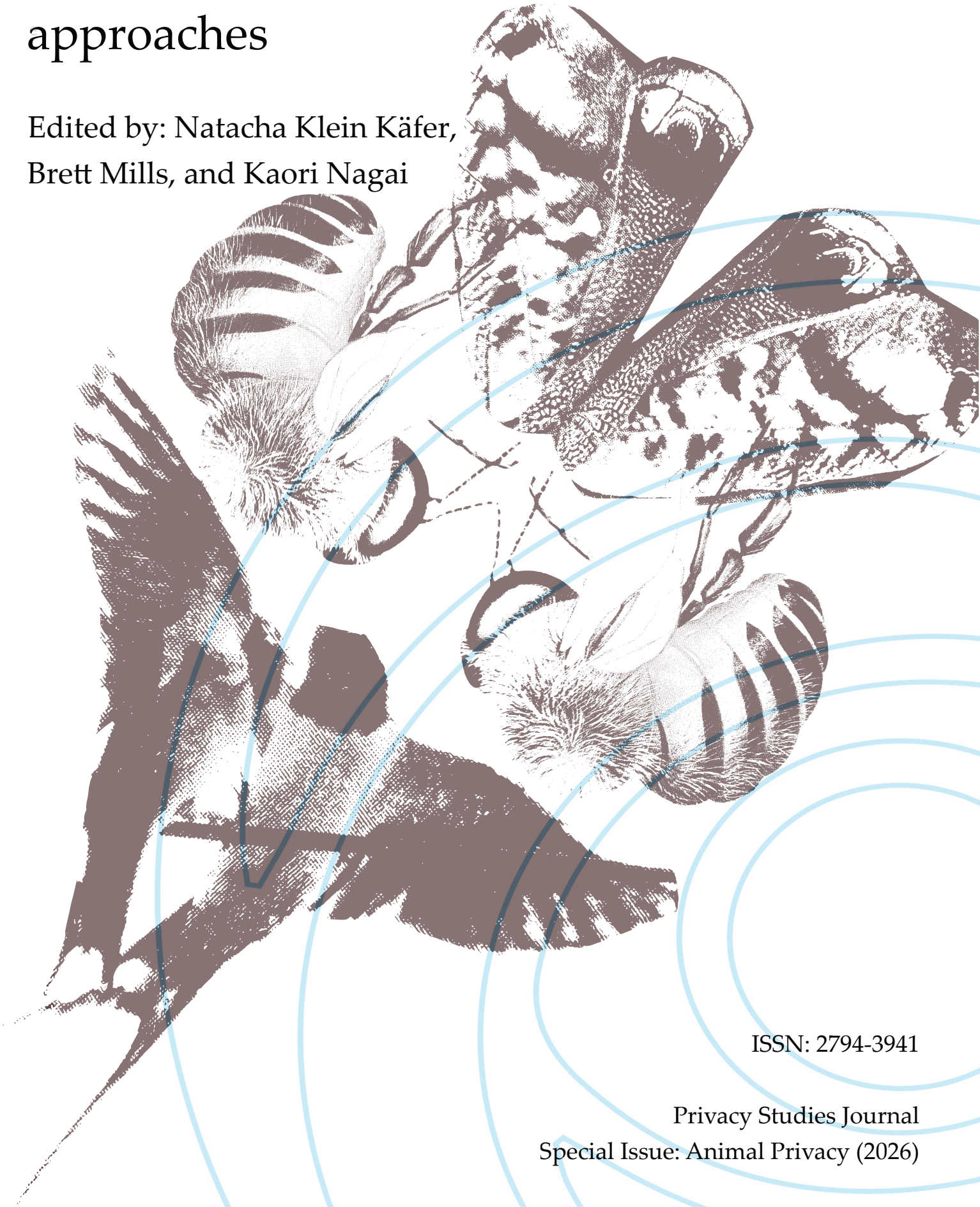

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Baby Watch: Capitalism, Technology, and the History of Maternal Privacy and Livestreamed Surveillance in Captive Animal Spaces

Andrea Ringer

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Abstract
Baby animals, which were first included in zoo populations as a novel financial windfall, are now the lifeblood of these captive spaces pushing their own image as conservators of species. The notion of privacy was something that captive animal mothers throughout the history of zoos did not experience, as keepers learned by experience to determine which birthing environments provided higher rates of infant survival throughout the twentieth century. While the first generation of mothers gave birth with visitors and zookeepers often keeping close watch, best practices changed as video surveillance allowed the illusion of privacy. However, even as pregnant animal mothers were given more notions of privacy away from the prying eyes of visitors or many keepers, zoos began keeping a closer eye on the birthing process, even if from a distance on a camera. Although mother animals in zoos have increasingly been placed in birthing environments more conducive to their physical well-being, the intersection of technology and capitalism has ensured that captive spaces afford even less privacy to them than in previous decades. This paper explores the history of animal births in captive spaces, from accredited zoos to private safaris in the US, and the ways that privacy—or the impression of privacy—has played a role in each of these experiences.

Keywords:
Reproductive labour – zoos – ex-situ conservation – endangered species – webcams – livestreamed birth

Introduction

In 1996, the Smithsonian National Zoo broke new ground when it partnered with Purina, an American petfood company, to deliver a livestream of two of its pregnant one-horned rhinoceroses. This was one of the earliest livestreams from a zoo, and the decision to point the camera at a pregnant rhino appeared to align with the mission of zoological institutions. The pregnancies created a buzz at the zoo because the babies would increase the zoo's collections, but they also worked toward the zoo's ex-situ conservation goal to increase the total number of endangered one-horned rhinos. One of the rhinos, Mechi, had delivered a stillborn baby during her previous pregnancy, so this birth would be especially important and quite possibly nerve-wracking.[1]

The webcam birth also aligned with Purina's Conservation of Animals Reaching Extinct Status (C.A.R.E.S.) campaign, which was seven years in the making by the time the camera was installed in the Smithsonian National Zoo's rhino habitat. Paired with the motto "Caring for Animals in All We Do," Purina enlisted the help of pet owners to save endangered wild species, noting in advertisements that when consumers bought their foods and pet accessories, Purina would donate money to the effort. They also made their campaign highly visible, partnering with local zoos with promotions such as discounted entry tickets. By the time Mechi was meandering around her enclosure awaiting the birth of her baby and while Purina's camera was pointed at her, the campaign had already amassed nearly four million dollars. However, the language surrounding the campaign pointed to more than simply conservation goals as it squarely aimed at the reproductive labour of captive animals. Purina noted that their "investment" was "paying off in the form of over 200 endangered animals born."[2]

Purina's years-long campaign had donated financial resources to captive breeding programmes to ensure the survival of endangered species like Mechi the one-horned rhino, but the webcam also pushed the zoo into new opportunities to engage with the public even when the zoo was closed. Leading up to the birth, visitors provided critical commentary, noting that the camera was intended to remedy the seemingly age-old problem that animals retreated to private quarters out of public view during the day. However, the image seemed too blurry and out of focus.[3] This critique, which centred the visitor experience, also offers an insight into larger ethical concerns with livestreamed births of captive animals. As zoos would continue to emphasize, animal safety was at the forefront of their practices. For visitors, however, both in person and virtually, their own experience foregrounds where the cameras are pointed or how a habitat is set up.

The newly installed camera ensured that Mechi's pregnancy, labour, and first few moments of motherhood with her new calf, Chitwan, would be visible to the public, a move that had long been abandoned in favour of best practices that tried to replicate species-typical birthing behaviour that included more limited human intervention. While

1 "Firm to Present 'Virtual Birth' of Rhinos," *St. Louis Post-Dispatch*, August 24, 1996, 8.
2 "Cat-Food Manufacturer, City Zoo Unite to Help Endangered Cats," *The Daily Oklahoman*, August 17, 1990, 65; "Purina Advertisement," *Times Record News*, August 3, 1997, 139.
3 "Netwatch: Want to see a pregnant rhinoceros?," *The Atlanta Constitution*, August 16, 1996, 90.

Mechi's on-camera pregnancy demonstrates how technology and capitalism intersected in 1996 to open the animal birthing process to the public, it is part of a longer history of financial gains centred on the reproductive labour of captive mothers. Those gains often came at the expense of maternal privacy.

This paper traces watershed moments in the history of privacy, with an eye on animal mothers and breeding programmes since the development of webcams. The paper places this history into a larger historiography of privacy and technology while tracking the relatively recent history of video monitoring in spaces of animal captivity. From Menchi in the 1990s through the opening decades of the twenty-first century, newspaper accounts of zoo pregnancies and births offer insight into how the public consumes these stories. But breeding programmes are a cornerstone of accredited zoos. After all, they fulfil the mission of ex situ conservation. That means that births are happening, quite literally, all the time in zoos. This paper takes a wide brushstroke to pull examples from accredited zoos, unaccredited zoos, and wildlife parks. It also examines a wide swath of animals, from tiny insects to large mammals. In short, if the public tunes into to watch an animal birth of any kind, and an institution decides to monetize the process through sponsorship, views, or just increased visibility for their institution, then it falls under the umbrella of what this paper examines.

The thread running through this history is not the practice of increased privacy, but instead the constant illusion of privacy. Zoos themselves embody the illusory for both visitors and captive animals. For visitors, it is the illusion of seeing an animal in its natural habitat, of witnessing species-typical behaviour, and perhaps of seeing animals being content, happy, or living a full life. This behaviour by zoo patrons and workers aligns with scholarly studies on voyeurism and falls under the umbrella of surveillance studies. Zoogoers view animals, anonymously and sometimes by the thousands during birthing moments, in ways that reflect broader trends of consuming unscripted entertainment. This article intervenes in larger conversations about privacy and autonomy, which most often centre on humans.[4] Much of that scholarship intersects, or at least aligns with, the experiences of animals. Particularly since the early 2000s, scholars have set their sights on technology and its role in people's expectation for privacy. In Sarah Igo's sweeping synthesis, *The Known Citizen: A History of Privacy in Modern America*, technology acts as the catalyst for major changes in notions of privacy over the course of centuries. In her human-centred history, Igo tracks watershed moments in the history privacy that intersect with the present study, such as the rise of reality shows. Although it is a history that explores human productions exclusively, the treatment of reality shows helps set the stage for the unscripted nature of cameras at zoos. Unscripted moments performed by animals in front of the camera have been explored most extensively in wildlife documentaries. While this article examines the development of webcams as surveillance technology in captive spaces, their use in wild spaces proliferated concurrently. Trail cams, wildlife cams, wildlife documentaries, and wildlife reality shows (which are discussed

4 See Sarah Igo, *The Known Citizen: A History of Privacy in Modern America* (Harvard University Press, 2018). For further analysis of the intersection of privacy and technology, see Debbie Kasper, "The Evolution (or Devolution) of Privacy," *Sociological Forum* 20, no. 1 (2005): 69–92; A. Michael Froomkin, "The Death of Privacy?" *Stanford Law Review* 52, no. 5 (2000): 1461–1543.

briefly here) all attract audiences that use digital spaces to interact with the natural environment. But as this article demonstrates, the histories (and oppression) of animals and people are often intertwined, and even as zoo workers are part of the surveillance process, they are also surveilled through webcams intended to watch captive animals.[5] Yet the most important piece may be the zoogoer itself as they uncritically and joyfully use their surveillance platform to witness moments of birth and parenting in ways that seem to align with the mission of zoos to practice ex situ conservation.

For animals, there is also an illusion. Most of this is related to the illusion of being alone and of not being watched. In this way, while animals are central to understanding the history of birthing cameras, surveillance in zoos has also had clear impacts on workers and visitors. Although intent for the surveillance of people and animals differed wildly, the impact on both sets of populations proved to be fairly similar as institutions have been able to use the programs to track a variety of demographics and animal management effectiveness. People visit zoo animals at astonishing rates, with the number of 2023 visitors reaching more than 183 million people in the United States alone. But the digital footprint outpaced physical attendance with more than 230 million YouTube views among accredited AZA institutions.[6] But, of course, compared to humans, surveillance levels are remarkably different for the animals themselves, which are living in spaces more akin to a total institution, where technology and surveillance are part of the totality of control.[7] As Torin Monahan has noted, "surveillance is about exercises of power and performance of power relationships."[8] Whether engaged in exotic animal trades in the early twentieth century, asserting their roles of conservators of a species, or placing cameras for extra viewership, zoos have indeed demonstrated the power dynamics of animal captivity.

In the realm of animal-related scholarship, this work builds on theoretical underpinnings developed by Peter H. Kahn, Rachel L. Stevenson, and Jolina H. Ruckert who analyse the displacement of nature by an augmented "technological nature." This is particularly significant for examinations of captive spaces where nature is often replicated in exhibits with zoo visitors in mind.[9] Scholars such as Andrew Burke and David Grazian have begun to think about the online presence of animals in captive spaces, but less attention has been placed on the experience of captive mothers.[10] While mother animals in zoos

5 Recent work by Ifeoma Ajunwa, Kate Crawford, and Jason Schultz has examined a longer history of increased worker surveillance through a variety of means, including biometrics and mobile devices. The zoo webcams examined in this article align with the larger history of worker surveillance, even as it is often occurring in a somewhat unintentional way. See: Ifeoma Ajunwa, Kate Crawford, and Jason Schultz, "Limitless Workers Surveillance," *California Law Review,* 105, March 10, 2016.

6 "Visitor Demographics," *Association of Aquariums and Zoos,* https://www.aza.org/partnerships-visitor-demographics, July 5, 2024.

7 The idea of total institution was first described by sociologist Erving Goffman. Gary T. Marx has more recently placed these ideas in contemporary subfields of surveillance. See Gary. T. Marx, "Surveillance Studies," *Internatinoal Encyclopedia of the Social & Behavioral Sciences,* Second Edition, vol. 23, (2015), 234.

8 Torin Monahan, "Surveillance as Cultural Practice," *The Sociological Quarterly* 52, no. 4 (2011): 495.

9 See Peter H. Kahn, Rachel L. Stevenson, and Jolina H. Ruckert, "The Human Relation With Nature and Technological Nature," *Psychological Science* 18, no. 1 (2009): 37–42.

10 Andrew Burke, "ZooTube: Streaming Animal Life," in *The Zoo and Screen Media,* eds. Michael Lawrence and Karen Lury (Palgrave MacMillan, 2016), 64–83; David Grazian, "Where the Wild Things

today are increasingly placed in birthing environments more conducive to their physical well-being, the intersection of technology and capitalism has ensured that captive spaces afford even less privacy to them than in previous decades. Zoos breed animals and capture them on film to help fulfil their mission as conservationists. Yet, as Anat Pick has analysed in some of the most significant scholarship on the ways that animals are always the observed from the human standpoint, modern attempts to place animals in captive spaces for the common good of a species is a fruitless endeavour.[11] Randy Malamud theorises further on this subject as he posits that zoos themselves are "voyeuristic, imperialistic, inauthentic, and steeped in the ethos of consumer culture."[12] And perhaps the development of the "zoopticon" idea by Ralph Acampora has proven most useful for this field as an extension of Michel Foucault's work. For both Foucault and Acampora, the "forced occupancy and demonstration" aspects of both prisons and zoos offer an apt comparison.[13]

This paper explores the history of animal births in captive spaces in zoos and the ways in which privacy—or the impression of privacy—has played a role in each of these experiences for both animals and viewers. Newspaper coverage offers a useful lens to gauge public interactions and awareness of webcams and other technological interventions that impact maternal privacy in zoos. This history is uneven, with certain animals getting more access to privacy than others and privacy practices shifting, depending upon the financial needs of the institution. The existance of an animal mother and her babies in a zoo is one that is highly profitable. These are the popular attractions—the animals who get press releases, who make the news, and who help to directly demonstrate the value of zoos as conservators of species. Despite their need for the survival of zoos from the first years in the creation of new zoo animals, mothers were largely discarded in the public eye both in the wild and in captivity nearly through the twentieth century. Yet the rise of webcams created a new, often beloved image of animal mothers as the mascots of ex situ conservation.

New zoos and known animals

Modern zoos were envisioned by Carl Hagenbeck, a German animal trader and zoo owner. By the early twentieth century, he had revolutionized the ways in which captive animals interacted with their exhibit and people encountered these animals. Hagenbeck de-emphasized bars and cages in favour of habitats that resembled the natural world. Moats, trees, and rocks dotted the zoos that took inspiration from Hagenbeck's designs. By the mid-twentieth century, most American zoos had clearly designed their exhibits around Hagenbeck's vision.[14] In terms of animal privacy, these new, seemingly natural

Aren't: Exhibiting Nature in American Zoos," *Sociological Quarterly* 53, no. 4 (2012): 546–563.

11 Anat Pick, *Creaturely Poetics: Animality and Vulnerability in Literature and Film* (Columbia University Press, 2011), 103-104.

12 Randy Malamud, *An Introduction to Animals and Visual Culture* (Palgrave Macmillan, 2012), 115.

13 Ralph Acampora, "Zoos and Eyes: Contesting Captivity and Seeking Successor Practices," *Society & Animals* 13, no. 1 (2005): 69–88.

14 For an in-depth look at Hagenbeck's architecture and design in zoos, see Jeffrey Hyson, "Jungles of Eden: The Design of American Zoos," in *Environmentalism in Landscape Architecture*, ed. Michael

landscapes gave people a more voyeuristic view of captive animals as they seemed to watch animals secretly rather than an eye-to-eye view through cage bars.

While zoos, circuses, and other animal spectacle industries proliferated throughout the middle of the century, they had fallen out of popularity by the 1980s. Legal animal trade markets had largely closed during decolonisation and zoos had to quickly pivot to conservation missions. Lisa Uddin and Daniel Bender have argued that in the midst of this, white flight from city centres decreased foot traffic and, by extension, dollars, to zoos as well.[15] However, by the 1990s, the crumbling architecture had been replaced by new exhibits and zoos began to embrace the possibility of technological innovations such as webcams.

In the first few years of webcam use, zoos tested their popularity on a variety of species. The Riverbanks Zoo in South Carolina began pointing its single camera to its penguin exhibit. It doubled its planned time to keep the webcam turned on or public viewing due to popular demand before adding a second camera in its white alligator tank.[16] However, the camera's next move—to an Amur tiger and her three cubs—proved most able to circumvent longstanding viewing issues at zoos that could cause curious zoogoers to grow frustrated. While animals in zoos have an array of natural waking and active times, visitors are generally bound by a late morning to early evening visit. Tigers remain most active in the night and during early morning hours, which is why newspaper advice instructed viewers to tune in from their personal devices at those times. While zoos had previously been able to present tigers mostly as sleepy cats who rested in the midday sun, the webcams showed the public a different image—one that welcomed viewers into the private moments of captive tigers that more closely resembled their wild counterparts.[17]

Zoos have historically tracked how many people view their collection of animals as well as the financial impact of those viewings, at least as well as they can. For example, in one of its first years in operation, the Zoological Society of Cincinnati noted that it had brought in nearly $47,000 in ticket sales that year.[18] With the introduction of remote technology such as webcams, zoos could track much more impressive metrics. The cameras

Conan (Dumbarton Oaks, 2000), 32; Nigel Rothfels, *Savages and Beasts: The Birth of the Modern Zoo* (Johns Hopkins University Press, 2008).

15 Lisa Uddin, *Zoo Renewal: White Flight and the Animal Ghetto* (University of Minnesota Press, 2015); Daniel Bender, *The Animal Game: Searching for Wildness at the American Zoo* (Harvard University Press, 2016).

16 "Tigers Debut on Zoo Webcam," *The State,* August 8, 2006, 10; "Rare White Alligator Debuts at Riverbanks," *The Item,* July 9, 2006, 17; "Riverbanks gets second webcam," *The State,* June 26, 2006, 13; "ZooView keeps eye on tiger," *The Times and Democrat,* August 3, 2006, 17.

17 "Zoo aims webcam at tigers," *The Charlotte Observer,* August 8, 2006, Y1. Scientific scholarship that examines differences between wild and captive behaviour includes Petra A. Grandia, Jiska J. van Dijk, and Paul Koewne, "Stimulating Natural Behavior in Captive Bears," *Ursus* 12 (2001): 199–202; T.S. Stoinski, B.B. Beck, M.A. Bloomsmith, and T.L. Maple, "A Behavioral Comparison of Captive-Born, Reintroduced Golden Lion Tamarins and Their Wild-Born Offspring," *Behaviour* 140, no. 2 (2003): 137–160. Animal studies scholars have also approached this topic from a cultural lens. For an example, see Katie Javanuad, Harshmeena Sanghani, and Grace C. Young, "The Future of SeaWorld," *Journal of Animal Ethics* 8, no. 2 (2018): 133–37.

18 A*nnual Report for the Zoological Society of Cincinnati*, 1888, 11, Cincinnati and Hamilton Country Public Library.

at the Riverbanks Zoo also brought increased numbers of visitors. Even though the park logged nearly 900,000 people in physical attendance the next year, it also began tracking the number of hits on its camera and ran promotions to increase visitor engagement.[19] While animals that were less likely to entertain the public with their antics—such as the koalas who were described as "incredibly cute but often boring"—were likely first choices for zoo webcams, the cameras quickly moved to animals that seemed to live more exciting lives in captivity.[20] They matched this with contests to pick the fan favourite webcam. Meerkats, who consistently appeared too busy to notice that they were even in captivity, won the first contest at Riverbanks Zoo.[21]

This peek into the preferences of zoo viewers demonstrates the expectations that people have of captive animals and the various ways in which they witness species-typical behaviour. The meerkats at Riverbanks Zoo won the contest probably because of their cute antics combined with the concurrent popularity of *Meerkat Manor,* a documentary series that also came to be known as "TV's first wildlife reality show."[22] The Animal Planet show followed a family of wild meerkats in the Kalahari Desert of South Africa. It included a cast of meerkat characters that viewers came to know, just like their captive counterparts in the Riverbanks Zoo. Animal Planet comically advertised the series as poised somewhere between *All My Children* and *Wild Kingdom* because of the unexpected amount of drama.[23] As an unscripted show in a controlled environment, the zoo webcams very much coincided with the rise of reality television. While *The Real World* became the longest-running reality show after debuting in the early 1990s, the early 2000s saw the rise of several competition-based franchises such as *Big Brother* and *Survivor.* In many ways, this is similar to the shift to event streaming at zoos. Randall L. Rose and Stacy L. Wood position reality television within consumer culture.[24]

Like the camera that was pointed at Mechi in 1996, the Riverbanks Zoo webcam was among several zoo cams that brought in corporate sponsors. Viewers looking for the Rivergate animals could visit the zoo website, the local newspaper website, the local news website, or local electric company SCE&G, which acted as the official sponsor of the cameras and was more notable as an energy company in South Carolina.[25] Other, more apt partnerships also funded zoo webcams, including the Sears Portrait Studio.[26] Among webcam options in the early 2000s, the Riverbanks Zoo consistently attracted viewers and attention. Earthcam.com provided yearly rankings of webcam options, which included bugs in biology departments, ski resorts, construction sites, and a variety of zoos. Riverbanks consistently ranked in the top 25 for its camera that rotated between animal exhibits.[27]

19 "Park flies under the radar, yet racks up visitors," *Sun-News,* August 13, 2007, 20.
20 "Zoo webcam expands cast of characters," *The State,* May 3, 2006, 14.
21 "Meerkats favorite webcam animal at Riverbanks Zoo," *The Gaffney Ledger,* September 10, 2007, 8.
22 "Reality TV at its wildest," *The Times Leader,* June 8, 2006, 38.
23 "Reality TV at its wildest," *The Times Leader,* June 8, 2006, 38.
24 See Rose and Wood, "Paradox and the Consumption of Authenticity through Reality Television," *Journal of Consumer Research* 32, no. 2 (2005): 284–96.
25 "Dive in with us!," *The State,* December 29, 2006, 31.
26 "Zoo cam has page to download," *The Belleville News-Democrat,* June 27, 2002, 21.
27 "Zoo's beasts, USC's bugs give city reason to boast," *The State,* December 20, 2006, 21.

The digital zoo

A shift occurred between 2003 and 2005 when zoos began to invest in a greater online presence, including webcams as they surveyed what brought in foot traffic. As journalist Claudia Zequiera reported in a 2005 syndicated story, a series of studies between those years by the Monterey Bay Aquarium indicated that people looked at websites which in turn impacted their decision to visit. In response to this shifting engagement with visitors, zoos and other captive spaces added high-speed internet and hired positions to support these new endeavours. By 2005, the San Diego Zoo admitted that "we've created the expectation that this is something a viewer should see on our site."[28] It was significant that the birth of a panda had spurred a syndicated news story about how webcams had become so synonymous with zoos in a little over five years. In these early years of live-streaming, the broadcast remained engaging because keepers could and would adjust the shot to ensure that the viewing public could always see the animals.[29] By 2011, a study published in *Zoo Biology* revealed that at least eighty cameras were running regularly in zoos. More than half of the respondents in the survey claimed that they planned to add more webcams to their facility.[30]

As people began to engage with the landscape of zoo webcams, larger conversations circled around how this technology directly impacted zoos. At first glance, institutions such as the San Diego Zoo which had added webcams to some of its most popular exhibits saw a decrease in attendance during these years. However, the financial value of cameras was not necessarily in foot traffic. Instead, it was the sponsorships that often accompanied the livestream which brought in the bulk of the revenue.[31] Indeed, webcams brought in even more impressive online traffic than in the earliest years. When two jaguar cubs were born at the Milwaukee Zoo, the institution closely guarded its young jaguars, keeping them from live display for their first few weeks of life. However, the cubs and their mother could still be seen via webcam. This virtual viewing provided the zoo with more exact metrics on how much foot traffic the jaguars could potentially bring in. Not only had more than 16,000 viewers tuned in to the livestream within the first three weeks, but they had also spent much more time on the jaguar page than other parts of the zoo website. The zoo noted that visitors spent an average of twenty-five minutes watching the jaguars, as opposed to the two-minute average that most people spent on the zoo's homepage.[32] The jaguar webcam demonstrated that people would engage with animal populations at zoos through virtual viewing, especially if those views included infants of the species.

The lack of privacy afforded to infants is a phenomenon that crosses species. As Debbie V.S. Kasper has noted, privacy is nearly non-existent for newborns and increases throughout childhood. Parents allow their children to wander as they get older and their survi-

28 *National Marine Sanctuaries: A Report to the Sanctuary Advisory Council: 2003 Field Research Review* (NOAA, 2003); Claudia Zequiera, "Show your fangs for the camera!," *Los Angeles Times,* September 6, 2005, 5.

29 "Zoo webcams keep wildlife in view," *The Charlotte Observer,* July 7, 2005, 28.

30 Gary Dodson and Cory Murphy, "Zoo and Aquarium Webcams: An Informed View," *Zoo Biology* 31: 418.

31 Zequiera, "Show your fangs," 5.

32 "Jaguar cubs born at Milwaukee Zoo brings new genes," *The Dispatch,* January 13, 2013, 11.

val is not necessarily contingent of constant parental supervision.[33] Observation shows that to be true of animals as well, but among watched animals in zoos the same trend exists with people who clamor to see the newborns well ahead of older juveniles or adult animals. While this might mostly be sheer fascination with the infant, there is also some sense of emotional attachment toward the young animals.

Within ten years, it was not just livestreamed animal exhibits that were popular; instead, births themselves became top attractions on Earthcam.com. When Autumn the giraffe gave birth to Kiko in 2012 at the Greenville Zoo in South Carolina, more than 200,000 people watched the birth. However, for months, 40,000 people continued to log in to the livestream each week to watch "those tender moments" between the mother and calf.[34] Following the introduction of livestreamed cameras, zoos continued to engage virtual visitors with increased technology, particularly surrounding births. With the widespread use of cell phones, the Zurich Zoo promised viewers interested in watching the world's first livestreamed elephant birth that they would send a text message or email when the time arrived.[35] These courtesy calls or texts proved especially useful since zookeepers have been quick to admit that it is difficult to estimate the exact gestation age of elephants. Remote access to cameras in zoo enclosures has also shifted how visitors interact with captive animals. This technology was used earlier in an Iowa State University lab where their "zoocam" was fixed on insects and could be controlled remotely by viewers.[36] Zoos have also adopted this sort of interaction with an awareness of the sheer traffic that the webcams generate. The Columbus Zoo and Aquarium in Ohio introduced several webcams in 2012, including the ability to control the angle and zoom range of the cameras through a queue that gave each user sixty seconds.[37] Around the same time, a survey indicated that ten percent of zoo webcams allowed visitors to control them remotely.[38]

The unintended shows on zoo webcams

The financial windfall from livestreamed pregnancies and births is substantial, sometimes even enough to keep an entire institution afloat. The Animal Adventure Park, a for-profit zoo in New York, made significant profits when it fixed a camera in April, its pregnant giraffe. It partnered with Toys 'R' Us to sponsor the video which became the second-most watched livestream in YouTube history in just a few months, with more than 232 million views. The subsequent viewership, and associated GoFundMe campaign for the care of the giraffes, increased foot traffic after its online popularity, and product lines brought in at least hundreds of thousands of dollars.[39] When April gave birth two months after the livestream began, 1.2 million people tuned in live to watch the birth.[40]

33 Debbie V.S. Kasper, "Privacy as Social Good," 179.
34 "Giraffe webcam makes list of top 25," *The Greenville News*, December 26, 2012, B1.
35 "Don't Forget," *The Guardian*, May 4, 2000, 43.
36 "Hotsites," *The Charlotte Observer*, September 9, 1999, 45.
37 "Animals go virtual with popular webcam views," *The Newark Advocate*, April 9, 2012, 2.
38 Dodson and Murphy, "Zoo and Aquarium Webcams," 417.
39 "Online baby fever boosts finances of tiny zoo," *The Missoulian,* April 24, 2017, A2.
40 "Whoa, baby!," *Citizens' Voice*, April 17, 2017, A11.

Early on in the livestream, viewers tuned in to the YouTube channel only to find out that the video had been removed for nudity and sexual content. Reportedly at the behest of "a handful of extremists and animal rights activists," the video was suspended for a few hours.[41] The pushback against the facility and its decision to livestream the birth garnered criticism from April's keepers and the viewers who had expected to see her pregnancy uninterrupted. A representative of Adventure Animal Park levelled accusations against its critics, including against the complaint that its actions were hurting giraffe conservation.[42] Although the video was quickly restored and the birth was livestreamed, the conversations re-emerged when April passed away from arthritis-related health issues just a few years later.[43] Heather Rally, the Supervising Veterinarian for the People for the Ethical Treatment of Animals (PETA) Foundation, released a statement on behalf of the organisation that touched on the implications of April's livestreamed pregnancies and births. Rally observed, "The tragedy here isn't that April died—it's that she never knew a life without gawking spectators or livestream cameras."[44]

Pregnancies at institutions with more resources offer more outlets to offer up the views to the public. Although births might not become available to the public as a livestream, cameras nonetheless capture the moment, and viewers are able to see a curated version of it. At the Cincinnati Zoo, Fiona made history as the first hippopotamus captured on ultrasound, marking a watershed moment in the tracking of animal pregnancies and births.[45] The Cincinnati Zoo capitalized on the online popularity of its hippo exhibit and announced in 2017 that it would broadcast *The Fiona Show* through its Facebook page after her videos had already racked up millions of views during the first eight months of her life.[46] Each episode in the series was a short documentary that chronicled her growth to adulthood.[47] The decision to feature Fiona marked a transition from webcam popularity to reality show star who was featured in TV guides. She was not just a livestreamed animal, but became a character in a produced show. It also demonstrated the connected nature of zoo animal broadcasts, whether it was a livestream or produced show. The hippo keepers at the Cincinnati Zoo also addressed the use of cameras in the enclosure, noting that Fiona appeared to like the attention. "She'll even leave food if she notices a large camera," noted hippo keeper Jenna Wingate who suggested that the hippo would gravitate toward a camera before she would gravitate to food.[48] While the production value of *The Fiona Show* made a celebrity out of the young hippo, other zoos continued to provide additional access to their webcammed animals through archival footage. While

41 Jennifer Earl, "'Giraffe Cam' video briefly flagged on YouTube for 'nudity and sexual content'," *CBS News*, April 15, 2017.
42 Jennifer Earl, "'Giraffe Cam' video briefly flagged on YouTube for 'nudity and sexual content'," *CBS News*, April 15, 2017.
43 "April, the giraffe that became an online sensation, dies," *St. Louis Dispatch*, April 3, 2021, A9.
44 "PETA Statement: Death of April the Giraffe," People for the Ethical Treatment of Animals, April 2, 2021.
45 "Episode 1: The Beginning," *The Fiona Show,* September 5, 2017.
46 "Baby hippo to star in Facebook series," *Rapid City Journal*, August 26, 2017.
47 "The Fiona Show," *The Idaho Statesman*, October 1, 2017, TV48.
48 Terry DeMio, "Fiona the hippo maintains stardom," *The News Messenger*, January 25, 2022, A6.

webcams were not always available during the early years, San Diego Zoo still offered an extensive library of pre-recorded video footage.[49]

The decision to offer live birthing events means that zoos must contend with additional medical dangers that webcam viewers might encounter. Elephants, one of the most popular captive populations and a species that often ends up on the other side of the camera, have notoriously difficult labours, with up to forty percent ending without a viable infant or calf that survives the first year. Intervention via Caesarean section remains too dangerous, and keepers can often do little more than simply wait to see if a calf survives the often days-long ordeal.[50] Zoos have appeared more cautious to livestream births of species that are notoriously riskier such as elephants. A 2011 pregnancy of Asha the elephant at the Oklahoma City Zoo demonstrated both the uncertainty of a viable elephant pregnancy and how zoos practiced selective viewing in these situations. The zoo partnered with a local fertility specialist to help track Asha's hormone levels and ensure a healthy birth. However, it also tracked Asha's general health and behaviour in the days leading up to the impending birth with 24-hour surveillance. Despite the constant watch of keepers and staff, Asha was off-limits to the public as she stayed in a maternity stall. The public remained informed of Asha's health through newspaper stories and additional content on the webcam site, and they could view Asha's sister, Chandra, in a camera that pointed to a different part of the enclosure.[51]

Asha's pregnancy and the detailed birth plan provided by the zoo also offered an insight into the ways in which captive breeding programs provided a radically different experience from wild birthing experiences for animals. Asha's pre-labour hormone tracking was part of a larger effort to ensure a viable elephant infant. The zoo's veterinary director, Jennifer D'Agostino admitted that they were "a little more hands-on with our elephant birth than we are some of our other animals."[52] Indeed, the final push came with the aid of a human intervention team, including someone who "saw the trunk [of the baby being birthed], wrapped his hands around it and pulled." While wild elephant birthing would usually be attended by other females in the herd, Chandra was kept away from her sister. Even Asha did not get immediate or complete access to her calf during or after the birth. The birthing staff had the new calf in a harness after an hour of examinations and bloodwork. The activities of zoo staff also paralleled initial mothering behaviour as they closely monitored Asha's interactions with her calf and rewarded gentle touches between the two with a watermelon for the mother.[53] The zoo kept the new elephant pair from zoogoers to try to encourage privacy and bonding. However, their introduction to the curious public was one that—like webcams—allowed a public gaze upon unknowing animals. While the mother and calf stayed in a stall, viewers could look down on the pair from soundproof windows above.[54]

49 "Zoos across the country are turning webcams on wildlife exhibits," *York Daily Record*, July 11, 2005, 17.
50 "Checks, balances aim to halt extinction," *The Orlando Sentinel*, May 24, 2003, E3; "African Elephant Gives Birth to Calf at Pittsburgh Zoo on Sunday," *The Morning Call*, September 14, 1999, 22.
51 "Integris physician partners with zoo for elephant birth," *The Daily Oklahoman*, April 12, 2011, 2.
52 "Integris physician partners with zoo," 2.
53 "Mom, baby elephant are doing fine," *The Daily Oklahoman*, April 17, 2011, 7.
54 "Integris physician partners with zoo," 2.

While Asha did not have a species-typical birthing experience for an elephant outside of captivity, her well-documented first moments in motherhood have been replicated repeatedly among captive elephants. These documented moments of Asha's life offer a window into the ways that the sociological concepts of private and public spheres. When the zoo separated Asha from her own family, they replicated the isolating experiences of motherhood typical for its captive animals, despite thousands of people watching nearly every moment from multiple angles. And even as scholars have noted the rise of public personas centered on motherhood since the rise of "mommy blogging," they are constructed with autonomy not afforded to captive animals.[55]

Despite the publicity that comes with livestreamed births not all zoos have embraced the technology—not because of privacy concerns for animals, but because there is always significant risk involved. As one zoo official noted, "too many things can possibly go wrong."[56] However, even with the inherent risk of death in the birthing process, zoo animals still offered a more controlled environment for viewers. While zoos were in their first few years of livestreaming their exhibits, other webcams offered the public views of animal births. When a man in British Columbia set up a camera pointed to an eagle nest in 2005, millions of people tuned in. However, the reality of eagle breeding issues and the impact of pesticides became apparent when one of the eagles discarded an egg over the side of the nest, which led biologists to conclude that it was infertile.[57] While these moments, which likely seemed especially tragic in the eyes of webcam viewers, could happen during any pregnancy, animals in zoos underwent extensive testing that made a viable birth more likely. As one journalist noted about zoo animals on the zoo webcams, "for better or worse, zoo animals are the most predictable; they have no choice."[58]

However, the decision to livestream meant that zoos brought the public into other unscripted moments that might have otherwise been out of view or at least would have had few witnesses. In 2006, the Smithsonian National Zoo had one of its cameras—dubbed the Panda Cam—fixed on Mei Xiang and her cub, Tai Shan. During an apparently playful wrestling bout, the mother knocked her cub off a five-foot rock and onto the floor where he loudly squealed. The incident proved the popularity of the camera as the zoo was "bombarded with calls and emails from worried panda fans who had witnessed the mishap on the zoo's webcam." This constant watch likely came as no surprise to the zoo as it had already reserved storage space in the Panda House for "an impressive inventory of gifts and mail for the cub and keepers" from webcam viewers from around the world.[59] Despite the terrifying moment, playful wrestling is something that audiences had become accustomed to seeing after the pandas ate their meals.[60] The mother and cub

55 Kara Van Cleaf, "Of Woman Born to Mommy Blogged: The Journey From the Personal as Political to the Personal as Commodity," *Women's Studies Quarterly* 43, no. 3/4 (2015): 247-264.

56 "Giraffe born at Toledo Zoo won't go on display on exhibit for a while," *Lancaster Eagle-Gazette*, April 9, 2017, A5.

57 "No Disney ending for egg watchers: Eagle egg discarded, millions of webcam watchers dismayed," *National Post*, May 3, 2006, 5.

58 Sandy Bauers, "Webcams focus of wildlife voyeurs," *Calgary Herald*, May 15, 2006, 43.

59 "Panda cub marks 1st birthday," *Republican and Herald*, July 9, 2006, A2.

60 "National Zoo celebrates Tai Shan's 1st birthday," *The Marshall News Messenger*, July 10, 2006, 6.

would play together, sometimes even roughly, and she was known to "give him a swat" if he went for her food.[61]

The zoo assured the public that the cub was more shaken than injured, but this well-documented and viewed accident by Mei Xiang spurred conversations about her fitness as a mother. How could a panda who should have had natural instincts have accidently hurled her baby to the ground? The zoo's response provides an insight into the way in which captive mothers were surveilled. It assured the public that Mei Xiang was a "fabulous mother" who had handled the transition to motherhood perfectly. Its proof for such a statement was the Panda Cam which had shown that "she was pure hands-on 24/7."[62] Viewers seemed to corroborate a distinct interest in Mei Xiang's behaviour as a mother. As one viewer noted in a newspaper interview, "The thing that was really thrilling to me was to see the mother pick up her little cub […] she was so gentle with it. Such a good mom."[63]

Fiona the hippo and Tai Shan the panda have demonstrated how webcam stars, particularly young stars, translate into funding for zoological institutions. Indeed, like its predecessors at the Smithsonian National Zoo and elsewhere, the Panda Cam became a useful technological tool that was directly tied to corporate sponsorship and financial gains. During Tai Shan's first year, the zoo drew in approximately 1.2 million visitors to the Fujifilm Giant Panda Habitat to see the growing cub. However, an additional 21 million visitors tuned in to the Panda Cam during that same period. Despite the high fees associated with panda loan agreements and even though they did not charge admission for entrance to the zoo, the Smithsonian National Zoo brought in significant revenues with associated costs such as parking and souvenirs.[64] Similarly, the Cincinnati Zoo's use of Fiona's likeness in endorsements and merchandise led their Vice President of marketing to put it plainly: "Fiona is a brand." While viewers first encountered her via webcam, they had since been able to eat Fiona cakes, drink out of Fiona mugs, and even drink Fiona beer. This assortment of partnerships had led to more than $1 million in direct donations.[65]

In the shutdowns during the first few months of the COVID-19 pandemic, webcams became the crux of public engagement at zoos. The Cincinnati Zoo informed disappointed zoogoers who wanted to see Fiona the hippo on site that she seemed to sorely miss constant audiences and the enrichment that came from seeing crowds outside her exhibit.[66] However, like so many other zoos, Cincinnati created a "Home Safari" that featured some of its most popular animals each day. Within three days, the zoo got an additional 800,000 Facebook followers, and within three weeks, at least $120,000 of their donations were directly tied to the Home Safari.[67] Fiona and the other animals featured on Home

61 "Crowds cuddle up to National Zoo's panda cub," *Albuquerque Journal*, April 16, 2006, 44.
62 "Zoo's popular panda cub turns 1 year old," *Kitsap Sun*, July 9, 2006, 5.
63 Zequiera, "Show your fangs," 5.
64 "Zoo's popular panda cub," 5.
65 Terry DeMio, "Fiona the hippo maintains stardom," *The News Messenger*, January 25, 2022, A6.
66 "Closed zoo says Fiona the hippo misses visitors, chomps treats in videos," *The Cincinnati Enquirer*, May 17, 2020, A2.
67 "Cincinnati Zoo's daily Home Safari show is a big hit online," *The Cincinnati Enquirer*, April 9, 2020, A7.

Safari demonstrated that zoos had more than two decades of experience in using technology to attract visitors, even if they remained virtual.

As zoos continued to engage patrons with their own apps, it was the birth of a baby that once again spurred this technology. In August 2020, within the first six months of the closure of zoos, a live camera on Mei Xiang at the Smithsonian National Zoo was set to capture a monumental occurrence: the live birth of another baby for her. However, this time, the baby came during a pandemic that had shut down zoos throughout the country. When the Smithsonian National Zoo announced the start of the panda breeding season, viewership immediately doubled.[68] As they awaited yet another birth from its giant panda Mei Xiang, its website could only support approximately 850 viewers at a time and the site remained overloaded. Instead, the zoo encouraged people to download the app to help them get a chance to view the newborns.[69] This was a significantly better experience for viewers than the livestreamed birth of Mei Xiang's cub in 2005 that attracted more than 637,000 over a three-day period and crashed the zoo's site for an extended period of time.[70]

Zookeepers remained on "baby watch" and veterinarians kept a careful eye on the mother panda who had miscarried in the past. Zoo spokesperson Pamela Baker-Masson excitedly addressed the pregnancy and impending birth, saying that "We need this! We totally need this joy. We are all in desperate need of these feel-goods." Those "feel-goods" came from the spectacle of a birth from Mei Xiang, whose reproductive life had been meticulously tracked in the zoo and who had become pregnant through careful monitoring and artificial insemination. The zoo had been closed to visitors for months prior to the birth. However, even during the shutdown, zoos helped maintain a constant interest in their animals through live webcams and a strong social media presence that updated the public on everyday happenings. When Mei Xiang gave birth at 6:35 p.m., the public fascination with her birth led to a 1200% spike in web traffic. One zoo official joked that "I'm pretty sure we broke the internet last night." The Panda Cam crashed continuously, and even zoo staff had trouble viewing their own cameras because they continued to be kicked off the livestream during the birthing event.[71]

As COVID-19 continued to impact the ways in which people could interact with animals at zoos, the institutions themselves struggled financially. However, they were also well positioned to pivot to virtual engagement because they had been offering some iteration of this for more than twenty years. According to the most recent data by the Association of Zoos and Aquariums (AZA) in 2022, two-thirds of adults who attended a zoo did so with a child. While schools were shut down and parents sought new ways to help their children engage with the world around them, the use of webcam viewing at zoos seemed perfectly suited to the occasion. In sheer numbers, zoos saw more than 183 million annual visitors every year. Online numbers appeared even more impressive, with

68 "Zoo webcams keep wildlife in view," 28.
69 "National Zoo says its panda has twins," *The Odessa American*, August 25, 2015, A8.
70 Zequeira, "Show your fangs," 5.
71 Ashraf Khalil, "World celebrates birth of panda cub at National Zoo," *The Macon Telegraph*, August 23, 2020, A6.

more than 230 million views on YouTube channels and 42 million people engaging with various social media sites.[72] People engaged with zoos because they sought additional content of their captive animals who doubled as stars, and none seemed more engaging than the webcams.

Conclusion

When Mechi passed away in 2021, the event received less fanfare than her televised pregnancy had in 1996. A few days after her death, the Mesker Park Zoo & Botanic Garden released a statement on its social media to notify the public and mourn her loss. It eulogised her life as the oldest rhino living in its facility who had endeared herself to the public through seemingly unique skillsets, such as painting pictures or blowing bubbles underwater. At 35, Mechi had outlived any expectations of her survival, given that the median age for one-horned rhinos is 30 years old. However, more importantly, she was orphaned by poachers in her infancy, which is why even her survival seemed to defy odds. Since that moment, Mechi had lived in the public eye, with millions of people seeing her throughout the course of her life at the National Zoo, Philadelphia Zoo, White Oak Conservatory, and finally the Mesker Park Zoo & Botanic Garden where she spent the last decade of her life.[73]

While she remained in a spectacle industry throughout her life, it was her time on camera during her pregnancy that radically shifted conversations around animal privacy in captive spaces. This history prompts questions of ethics with its ties to corporations that cannot be disentangled. The initial partnership with Purina was not a one-off in the history of the livestreaming of births. Instead, it paved the way for how people engaged with animals and technology in captive spaces. The uncertainty of a birth, both in terms of timing and its success, probably keeps viewers cued in more than in other exhibits. For zoos and the financial backers of their webcams, this means constant viewership whenever the camera is available.

Since the development of webcams in zoos in the 1990s, technology has continued to evolve to find more ways to engage the public. There are larger implications for how this technology might develop to further deepen the intersecting networks of capitalism, technology, and animal privacy, especially through the future long-shot goal to perhaps reintroduce captive animals to the wild. When Happy Feet, a young emperor penguin, was found on a New Zealand beach in poor health, he went under the care of a veterinarian at the Wellington Zoo. During his two-month stay at the zoo, Happy Feet regained his health and became popular with online viewers who watched him "eat, sleep, and waddle on a zoo webcam." Like other livestreamed animals at zoos, Happy Feet gained a following of 250,000 people and provided viewers with a heartwarming story. Upon his release to Antarctica, the zoo fitted Happy Feet with a GPS device so that they could

72 "Visitor Demographics," Association of Zoos and Aquariums, https://www.aza.org/partnerships-visitor-demographics?locale=en, accessed May 12, 2022.

73 "Zoo announces death of Indian rhino Mechi," *The Gleaner*, October 31, 2021, A3.

continue to follow him online for at least a few months after his release.[74] While scientists anticipated his GPS device to remain with him until the next moulting season, they instead abruptly lost the signal just one week later. Attention-grabbing headlines insinuated that he was presumably dead, perhaps eaten by orcas or seals. That might be true, but Colin Miskelly, who was part of Happy Feet's treatment team while he was nursed back to health, made a more astute observation when he said that "it is time to harden up to the reality that the penguin has returned to the anonymity from which he emerged."[75]

For Mechi the rhino, Fiona the hippo, and the hundreds of other animals who have graced zoo webcams, anonymity and privacy are things out of reach within their permanent status as captive species. Instead, these animals—particularly mothers—became ambassadors for zoological institutions. Backlash to these cameras has remained minimal, but also poignant. It cannot be overlooked that the reproductive labour of a few female animals has had a disproportionate impact on the development of webcams and other surveillance technology. Zoos are interested in viable breeding programs and animals who have proven track records as good mothers. This means that livestreams often feature the same cast of animals who repeatedly show up as they embark upon motherhood time and again, like Mei Xiang did. The expectations of webcam viewers once Happy Feet was released also demonstrate the ways in which captive populations of animals colour people's perceptions of wildlife. Webcams in zoos become more akin to their reality show counterparts, given that controlled environments only allow so many outcomes. Being eaten by an orca is not one of them.

The ability to control public image is at the heart of many discussions about privacy and surveillance technologies. In the case of zoo webcams, such control is significant because it allows the webcams to further the mission of zoological institutions by livestreaming moments that demonstrate their necessity to animal conservation. The popularity of the livestream of Mechi's pregnancy paired with the quiet nature of her death particularly reveals the selectivity of the decision to open the lives of exhibited animals to the public. However, a compelling reference to privacy in a research article written during the first decade of webcam use shows the human-centric nature of livestreaming at zoos. Among the pieces of advice given to zoos to help them make an informed decision about adding a webcam, the authors of the study warned zoos about where they decide to place the camera. "Keep in mind," they warned, "that keepers and visitors can be observed any time they are in the field of view […] it is important to be aware that voyeurs will use your camera to invade privacy if the set-up allows."[76] This reference to privacy is something which is typically reserved for the keepers who spend their working lives inside zoos and not the animals who give birth and mother on live camera throughout the course of their lifetimes. It is indicative of how zoos have understood the role of technology, the moments that can and should be open to the public and their potential financial gains, and the role of its animal stars.

74 Nick Perry, "New Zealand Sending Off-Course Penguin Home," *The Commercial Appeal*, August 30, 2011, 3; Nick Perry, "Wayward Emperor Penguin Released Near New Zealand," *The Daily Oklahoman*, September 5, 2011, 11.

75 Maev Kennendy, "Happy Feet the penguin's tracker falls silent," *The Guardian*, September 12, 2011.

76 Dodson and Murphy, "Zoo and Aquarium Webcams," 424.

But it also points to the ways that public unabashedly partakes in the surveillance process, often in uncritical ways. Often with no person in view, the captive animals often appears wild, a sight that zoos have been trying to capture since Hagenbeck's design revolution. But, perhaps more significantly, the willingness to electronically visit zoo enclosures limits the oversight from visitors on how these institutions run outside of the cameras. Accredited zoos, unaccredited zoos, wildlife parks, and rehabilitation centres all offer online animal viewing, leaving visitors fairly unwilling to distinguish between the types of captivity as long as they can see the seemingly unwatched animals. While zoos still welcome hordes of visitors to their physically curated space, thousands more log on to their digitally curated space and get a much closer experience to events like birth, which were previously private for concern for the animals. In this way, while the trajectory of zoos may seem to be lifting the veil of operations with increased accreditation processes, the digital visitor allows institutions of varying types to commodify nearly every moment of animal captivity in birthing stalls or half-acre pens that look relatively similar. So while animals may not be aware of the surveillance process, it is the zoogoer who may be changing their relationship to animal captivity.

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