

INSIGHTS

BOOKS *et al.*

REVIEW ROUNDUP

Science at Sundance 2023

A team of wildlife crime hunters work overtime to take down a dangerous ivory poaching ring. A couple tenderly navigates life with Alzheimer's disease. A space agency prepares for a manned mission to Mars. From a satirical glimpse into the future of human reproduction to a sobering look at the history of visual propaganda, a number of films featured at the 2023 Sundance Film Festival touched on topics and themes likely to be of interest to scientific audiences. Read on to see what our reviewers thought of seven of the films on offer this year. —Valerie Thompson

Poacher

Reviewed by **Vijaysree Venkatraman**¹

A gunshot pierces the skull of an adult male elephant, a tusker, and it slowly slumps to the ground. This gruesome but gripping opening shot kicks off the engrossing episodic program *Poacher*, inspired by a true

story, in which a motley team of wildlife crime fighters expose the largest ivory ring in Indian history.

The series is set in 2015 in the jungles of Kerala, an Indian state nicknamed “God’s own country,” where, in 1994, authorities quashed an ivory-smuggling ring involving transnational crime syndicates. In the opening scene, a whistleblower comes forward

to offer information on “Raaz,” a dangerous elephant poacher the man claims is active in the area, but state officials are initially dismissive. Surveillance technology has become commonplace, and large-scale poaching is thought to be a thing of the past.

In this fast-paced investigative procedural—the first three episodes of which debuted at Sundance—narrative momentum is maintained without forfeiting character depth. India’s religious diversity and the many languages spoken in the country are on full display: Viewers will hear Malayalam, English, and Hindi throughout the series.

The show’s protagonists include computer programmer and snake expert Alan Joseph (played by Roshan Mathew), who builds a case against the poacher that “will live and die on data analysis,” and forest officer Mala Jogi (Nimisha Sajayan), who leads raids into the hideouts of dangerous suspects and cleans up after the botched efforts of her colleagues. When the team eventually tracks down Raaz, viewers realize that this is just the beginning of a very complicated case.

Cleverly interspersed shots from the misty jungles suggest that the region’s animals are



keeping a wary eye on the proceedings of the case too. If the elephants go, the jungle ecosystem will collapse, and Kerala will eventually be as polluted as the national capital, New Delhi, viewers are told. An aerial shot of the vehicle-clogged arteries of that megacity hints at what would be lost if this came to be.

Wildlife crime fighters are an overworked lot with little personal time. In *Poacher*, their triumphs and struggles are told with empathy. The dedication of these men and women to this dangerous work suggests that there is still hope for the future of wildlife on a planet where humans are now the top predators.

Poacher. *Richie Mehta, director, QC Entertainment, 2022, 125 minutes.*

Deep Rising

Reviewed by **Alison E. Barry**²

Using spectacular deep-sea cinematography, *Deep Rising* raises the alarm about the dan-

gers of mining metallic nodules from the abyssal plains of the Pacific Ocean. The film weaves together, with partial success, several distinct story lines that suggest the complexity of its subject.

The film devotes much screen time to a start-up first known as DeepGreen, later renamed The Metals Company. Its CEO, Gerard Barron, tells audiences that nodules located on the seafloor are a rich source of the metals needed for batteries used in electric cars, thereby promoting green energy transition. According to Barron, the seabed is “the most desolate place on the planet,” making development of this resource “clean” and far preferable to terrestrial strip mining. (Current scientific knowledge indicates a very high degree of biodiversity in the abyssal zone.)

Deep Rising shows both unsuccessful and successful deployments of a prototype nodule collector that resembles a cross between a combine and a vacuum. In its brief maiden voyage, it generates a huge cloud of fine sediment as it devours a small section of the seafloor. It is an impressive machine, but it is hard to discount concerns about

disruption of the abyssal ecosystem.

Sandor Mulsow, a marine biologist and former director of environmental management at the International Seabed Authority (ISA)—an agency created by the United Nations Convention on the Law of the Sea (UNCLOS), which regulates the exploration and development of deep seabed mineral resources—frequently asserts in *Deep Rising* that the deep seabed is our “common heritage.” This is not just his personal mission statement; he is quoting directly from UNCLOS, which was ratified in 1994 and is currently upheld by more than 160 member nations. (The United States signed the treaty in 1994, but the US Senate has never ratified it.) Tense scenes from ISA’s hearings regarding proposed mining regulations reveal the conflicting motives and sentiments of various stakeholders.

The film uses Mulsow to bolster and lend credibility to its primary thesis: that mining to supply batteries for electric cars is unnecessary and will irretrievably disrupt fragile ecosystems to our detriment. But this is not as persuasive as the filmmakers evidently believed. Few facts



Alvy (Chiwetel Ejiofor) and Rachel (Emilia Clarke) embrace a tech-enabled pregnancy in *The Pod Generation*.

are mustered to support Mulrow's opinion about the availability of other battery technologies that do not require any kind of mining, even if we are willing to accept his message about environmental harm.

Ultimately, none of the subjects depicted in *Deep Rising* acknowledge the fundamental conflict between known benefits and unknown costs that besets our world. The film might have been more effective in advancing a meaningful discussion had the filmmakers chosen to focus on one of its many story lines or had explored the connections between them.

The views expressed are the author's own and are not intended to represent the opinion of DCP Midstream, LP, or its affiliates.

Deep Rising, *Matthieu Rytz*, director, Roco Films, 2022, 93 minutes.

The Pod Generation

Reviewed by **Nathaniel J. Dominy**³

Winner of the 2023 Alfred P. Sloan Feature Film Prize, *The Pod Generation*, written and directed by Sophie Barthes, envisions a believable future of artificial intelligence (AI)-mediated comforts. Guided by deep learning, "Elena"—an attentive and opinionated AI assistant—can brew a latte and print toast to perfection, all while offering wardrobe advice and monitoring one's "bliss index."

But the film is not so much about AI as it is a fable about Rachel (Emilia Clarke), a fast-rising tech executive, and her husband, Alvy (Chiwetel Ejiofor), a university botanist, and the challenges of pregnancy.

The tension begins when Rachel's company, Pegazus, offers her a promotion with a corporate benefit: subsidized, priority access to its own subsidiary firm, The Womb Center, which produces and rents detachable wombs—gleaming egg-shaped pods—equipped with countless features to nurture, soothe, and stimulate the unborn baby.

Pegazus will even educate pod-born children in its own private schools, putting an insidious spin on its motives. Indeed, the honeycombed windows of The Womb Center are an inspired visual metaphor, suggesting a keen interest in the reproductive biology of eusocial insects, of controlling the growth and development of its own labor force.

For Rachel, the idea of a pod-incubated baby holds appeal for minimizing career disruptions, whereas Alvy, ever the nostalgist, prefers a natural process. Eventually the couple bring home a pod, with Alvy taking on most podcare responsibilities.

In one poignant scene, Alvy cradles the pod while watching Werner Herzog's *Encounters at the End of the World*. He is moved to tears by a "disoriented or deranged" Adélie penguin as it waddles "toward certain death." It is a tragicomic testament to the costs of social detachment, a theme mirrored in *The Pod Generation*. Increasingly unsettled by the intrusive technologies that surround them, the couple begins to wonder whether there is another way forward as their child's due date looms.

Through Alvy, the film touches on the complex pollination biology of figs, the symbiosis of lichens, and the "wood-wide web," giving viewers the sense that no organism is autonomous and independent, least of all humans. But these moments valorize Alvy at the expense of the concepts themselves. The biological consequences of integrating deep

learning AI into the human holobiont, and the potential for host organism reversal, is a film for another time. Still, the egg-shaped artificial womb serves its purpose of startling the viewer, of satirizing and critiquing our overreliance on technology.

The Pod Generation, *Sophie Barthes*, director, MK2, 2022, 109 minutes.

The Longest Goodbye

Reviewed by **Vijaysree Venkatraman**¹

In the next decade, NASA plans to send astronauts to Mars on a 3-year mission. The journey itself will take ~6 months each way. Whereas the various components of a spaceship can be tested under extreme conditions, the effects of prolonged social isolation on the crew members' emotional well-being remain unknown. And yet, how well the astronauts hold up mentally and emotionally in those cramped quarters could make or mar the mission. This simple but profound idea is elegantly explored in *The Longest Goodbye*.

The documentary features commentary from AI Holland, a NASA psychologist who is tasked with keeping space explorers mentally fit, as well as insightful interviews with astronaut Cady Coleman, who lived aboard the International Space Station (ISS) for 6 months from 2010 to 2011; Sukjin Han, a member of an Earthbound Mars simulation crew; and Kayla Barron, an astronaut currently in training for a potential Mars mission.

Archival video of Coleman's interactions with her family—which include a long-distance musical duet and a game of tic-

tac-toe—over a shaky internet connection during her 6-month stint at the ISS makes for heartwarming scenes. Coleman's son, Jamey, then in fourth grade, had a tough time with his mother's absence though. As he explains in the film, he always tried to put on a brave face for her.

"Crew members' connection with family is a critical piece of sustenance for them," Holland observes. Such connections are important during any long period of separation, learned Holland in 2010, when NASA was called in to help manage the mental health of 33 Chilean miners trapped underground. The documentary includes footage of the miners' 69-day ordeal and celebrated rescue, along with touching scenes of video calls with their families during their entrapment.

In a Mars expedition, astronauts will not be able to communicate with their families in real time, so experts are trying to come up with new strategies to counter homesickness. In the film, they discuss possible solutions, including virtual reality rendezvous with loved ones, AI-enabled companions, and even the possibility of inducing hibernation during the flight. A medical coma may spare the astronauts some angst en route but will likely lead to readjustment issues when they awaken, the experts concede.

Sometimes, the mission to Mars feels like too much to ask of any human for the sake of science. And yet the explorers who volunteer for such endeavors are often among the most eager participants. "If I could have spent another 6 months [on the ISS], I would have stayed in a minute," reveals Coleman in the closing moments of the film.

The Longest Goodbye. Ido Mizrahy, director. Outlook Filmsales, 2022, 87 minutes.

Is There Anybody Out There?

Reviewed by **Gabrielle Kardon**⁴

Scientists, like physicians, frequently approach disabilities as problems to be solved. *Is There Anybody Out There?* pushes back against this notion, offering viewers a glimpse into the full and complex lives of people with disabilities as they navigate the world and the worldviews of the able-bodied.

"Is there anybody out there with a body

like mine?" is the question that motivates director Ella Glendining—who was born without hip joints and with short thigh bones—to document and explore her rare condition. Proximal femoral focal deficiency (PFFD) affects only 1 in every 200,000 children, few of whom have both legs affected, as Glendining does. Glendining has never met anyone who looks like herself and grabs a camera to document and explore her condition.

Glendining was born in Norfolk, UK, to supportive parents. However, when she started school, she realized she was not like her classmates. Archival footage of children with disabilities underscores how they are often made to feel different, with no potential for fulfilling lives. Glendining's interview with disability rights advocate Kevin Donnellon, a subject of one such film, compellingly shows how far from true this is.

In the film, Glendining discusses the challenges of finding work, where her job applications are denied because of her disability, and of pregnancy, where there are concerns about whether her PFFD will affect her ability to give birth. She is constantly exhausted from her daily interactions with people who cannot hide their shock when seeing her. "It is what it is," as they say on *Love Island*,² she deadpans to the camera.

In her quest to find others who look like her, Glendining eventually meets Priscilla, Ricardo, and Charlie—all of whom have bilateral PFFD—and she feels less alone. Their disabled kinship is rejuvenating and joyous.

However, her efforts to find others with PFFD also reveal different attitudes toward her condition. Her parents took an "if it ain't broke, don't fix it" approach toward



Ella Glendining navigates ableist environments and worldviews in *Is There Anybody Out There?*

her body, yet others struggle to decide whether their children might be better off undergoing a complex series of surgeries to "fix" their limb abnormalities. Conversations with orthopedic surgeon Dror Paley and several parents facing the difficult decision of whether to subject their young children with PFFD to surgical interventions highlight the complex views held about bodies that differ from societal expectations.

While she finds being disabled in an ableist world brutal, Glendining would not change a thing about herself. "I love and respect my body," she confidently confides. "Being this way is not the problem."

Is There Anybody Out There? Ella Glendining, director. Hot Property Films Ltd, 2023, 87 minutes.

Fantastic Machine

Reviewed by **Nathaniel J. Dominy**³

Directed by Swedish visual sociologists Axel Danielson and Maximilien Van Aertryck, and winner of the World Cinema Documentary Special Jury Award for Creative Vision, *Fantastic Machine* is a sprawling history of camera technology and image-making. The film opens with the reactions of contemporary people experiencing a camera obscura, prompting one to exclaim, "Science, bitch!" It is a fitting expression of discovery and exhilaration, and it sets the tone for the first act.

The film then pivots to the origins of image permanence, beginning in 1827 with the earliest preserved photograph by Joseph Niépce. From there it unfolds swiftly and reverentially through the milestones of early photography, highlighting the contributions of Louis Daguerre (first person pictured), Eadweard Muybridge (first moving images), William Friese-Greene (first motion picture camera), and the Lumière brothers (first cinema with paying audiences). But this film is more than rote history.

It sharpens its focus with the reaction of King Edward VII to Georges Méliès's staged recreation of his coronation in 1902: "What a fantastic machine the camera is." This one-liner captures the love-hate thesis of *Fantastic Machine*—that humans have altered and often perverted the moving image to rewrite reality. Engaging but not revelatory, the film never acknowledges the irony of delivering its perspective through the very medium it criticizes. But perhaps the intent

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is to replicate the zeitgeist of our era, to produce an objective analysis that erodes the viewer's trust in objectivity.

This tension is palpable in the first sanguine words broadcast on Irish national television in 1961: "I hope this [television] service will provide for you all sources of recreation and pleasure, but also information, instruction, and knowledge." Although President Éamon de Valera added a prescient warning: "Like atomic energy, I am somewhat afraid. It can be used for incalculable good but also irreparable harm."

Fantastic Machine shines when it strives to instill image literacy. Vivid and fiercely edited are the scenes that juxtapose the work of Nazi propagandist Leni Riefenstahl—interviewed in 1993, she is practically giddy with her own skill at uplifting genocide—and British producer Sidney Bernstein, who sought to document the atrocities of the Holocaust. It is a meticulous and searing dissection of image-making in the service of truth and power.

The film ends with the "Pale Blue Dot" photo of Earth taken in 1990 by Voyager 1. It is a humbling image of introspection, not least because the Golden Record aboard the spacecraft contains 116 photos of humanity that pointedly exclude scenes of violence or suffering. An iconic instrument of science and verisimilitude, Voyager 1 is just another fantastic machine.

Fantastic Machine. Axel Danielson and Maximilien Van Aertryck, directors. See-Through Films, 2023, 88 minutes.

The Eternal Memory

Reviewed by **Gabrielle Kardon**⁴

The Eternal Memory, directed by Maite Alberdi, is a poignant and intimate portrait of a couple facing the challenges of Alzheimer's disease. The documentary follows Augusto Góngora, a prominent Chilean journalist who documented the brutal 17-year dictatorship of Augusto Pinochet in the 1970s and '80s, and Paulina Urrutia, a well-known actress and the first Chilean minister of culture.

In 2014 at the age of 62, Góngora was diagnosed with Alzheimer's, and Urrutia became his primary caregiver. When approached by Alberdi about a possible film project, Góngora convinced Urrutia to embrace the opportunity, saying, "I have no problem showing my fragility. I've made so many documentaries, why wouldn't I want to be filmed in this situation?"

The film records their journey over the past 4 years, a time in which Góngora's memory loss and dementia rapidly accelerated. Viewers see the couple's day-to-day activities—Urrutia reminding Góngora who he is and of their relationship, Urrutia gently washing and feeding Góngora, and the pair walking slowly around their neighborhood. Interspersed with such scenes is archival footage of Góngora's reporting, Urrutia's acting, and clips from old home movies.

Early in the film, Góngora has moments of lucidity, and his charisma and enjoy-

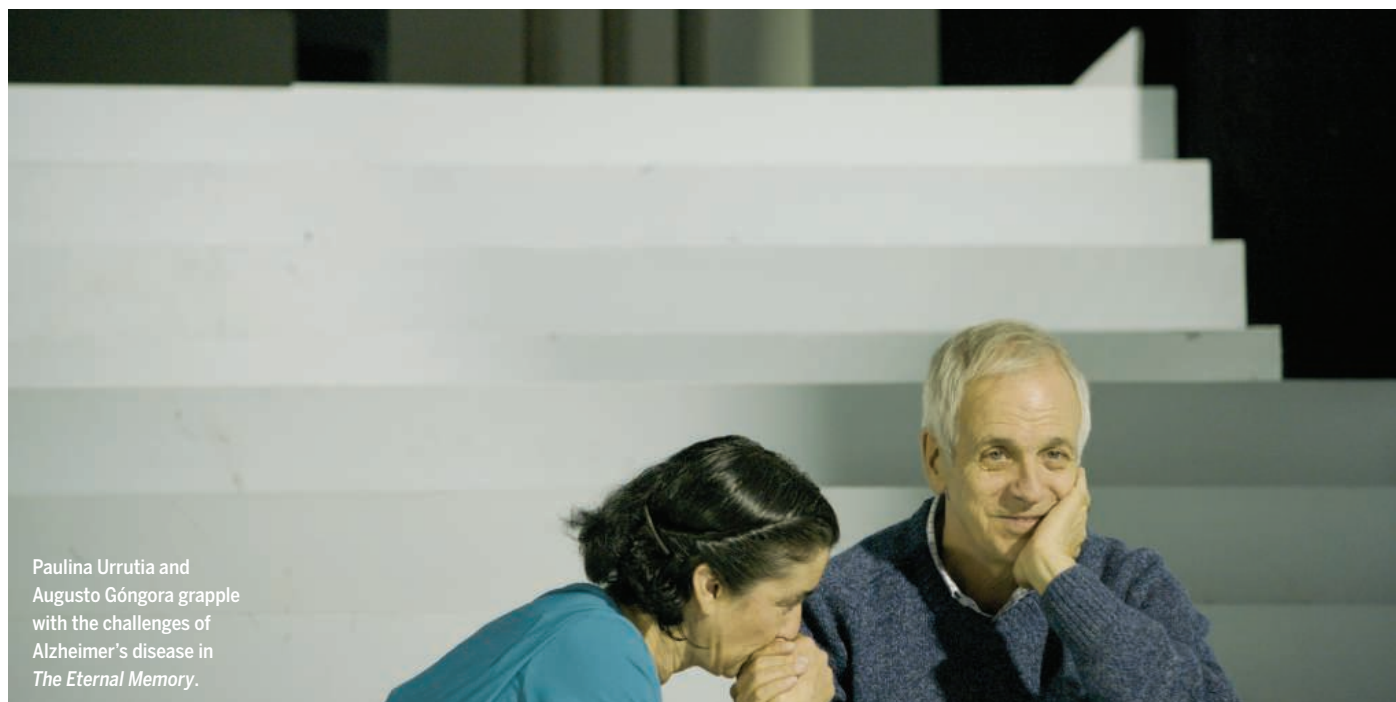
ment of life are evident. He accompanies Urrutia to rehearsals and attends her performances with mild bemusement. However, toward the end, the ravages of the disease become more pronounced. Scenes filmed in the middle of the night by Urrutia, a measure necessitated by COVID-19 restrictions, intimately reveal his fragility and anguish. "Please help me," he pleads. "I can't go on like this."

The importance of memory and the tragedy of its loss are even more poignant given Góngora's work as a reporter. Góngora was a major contributor to *Chile: La Memoria Prohibida*, an important three-volume book documenting the events of the Pinochet regime and its consequences. Viewers watch as Urrutia reads Góngora's own words from the book: "Without memory we don't know who we are...we wander, confused, not knowing where to go...there is no identity."

The Eternal Memory, winner of the World Cinema Grand Jury Prize for Documentary at the 2023 Sundance Film Festival, is a profound and deeply intimate exploration of one couple's struggle with the losses imposed by Alzheimer's disease, but also the resilience of their love. Scientific audiences, normally focused on the etiology of Alzheimer's, will be reminded of the disease's devastating personal costs. ■

The Eternal Memory. Maite Alberdi, director. Micromundo/Fabula, 2023, 85 minutes.

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Paulina Urrutia and Augusto Góngora grapple with the challenges of Alzheimer's disease in *The Eternal Memory*.

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