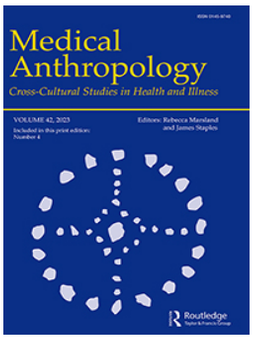

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Researching the Ebola Reservoir with the Heuristic of the Fetish in Guinea

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ABSTRACT

The unprecedented character of the 2013–2016 epidemic of Ebola in West Africa paved the way for a wave of investigations into the reservoir of the disease. A novel economy of health projects arose, which employed Guinean professionals to sample animals and fortify a hypothesis: that the disease spilled over from a bat. Through exploring virology research and its dangers in post-Ebola Guinea, I argue that the hypothesis of a bat reservoir has taken on a heuristic role that can be compared to the way that a fetish polarizes relations between the people who manipulate and fear this idea.

KEYWORDS

Biosecurity; bushmeat; emerging infectious diseases; Guinea; One Health; virus hunting

"There was a disease, a mysterious disease," recounted Norbert, a veterinary doctor from the south-eastern region of the Republic of Guinea known as Forest Guinea. "People thought there was a malediction in Meliandou." Many similar stories arose to explain how the largest Ebola outbreak to date began in December 2013. As members of a family experienced black stool, diarrhea, vomiting, and began to die, neighbors attributed their deaths to transgression against a "fetish." Had he also not heard, Norbert remembered, that a sorcerer maliciously threw a fetish in a well to sicken people? "The authorities told us, in the end, that this was not a mysterious, but an infectious disease," Norbert concluded. In March 2019, the veterinarian was briefly employed by infectious disease specialists from Russia to locate and sample, in the market of Forest Guinea's capital city, animal parts used to make what the foreigners also called fetishes. The scientists were rather disappointed to hear that no such market section existed.

The trope of mysterious germs has fueled microbiology since the nineteenth century. Unexplained and deceptive pathogenicity puzzles doctors and scientists alike. But the expression takes another meaning for Norbert and the many Guinean professionals in the biosciences, for whom "mysterious" and "infectious" speak to different origins of diseases (also Thys 2019). Diseases either have natural causes or are caused by persons who intend to do harm, in many West African etiologies, a distinction which is echoed in the way scientists and policymakers have framed the origin of novel infectious diseases as either "natural," "accidental," or "deliberate" (i.e., for biowarfare or bioterrorism) since the 1990s. Delving into this slippage means interpolating insights from both the burgeoning study of zoonotic diseases (Keck and Lynteris 2018) and the heuristic of the fetish.

The fetish is both a descriptive notion and an analytical concept in anthropology (Graeber 2005; Pietz 1985). The term emerged in the imperial contact zone of the sixteenth-century Guinea Coast of Africa, where Portuguese merchants sought to describe the relations of their trading partners with the invisible world. The etymological root of the word lies in the Portuguese *feitiço*, connoting "sorcery," itself from the Latin *facticius*, i.e., "made, artificial:" fetishes first designate artifacts to which effects in

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Media teaser: "Virus hunters" have been searchingfor the origins of Ebola in West Africa through sampling bats. But why must theyhide themselves and their work?

the world are – wrongly – attributed. Like an object at the bottom of a well in Meliandou, and perhaps like a doubtful story about a bat?

No outbreak of Ebola had been heretofore recorded in West Africa when, in March 2014, the cause of the epidemic was identified as the Ebola Zaire virus.[1] The epidemic would continue for two years: more than 28,600 people were infected and 11,325 officially died. Its containment was marred by episodes of violence, particularly in Forest Guinea where it disrupted longstanding accommodations with neglectful leaders, developed to cope with a history of slavery, colonization, and ethnic conflicts (Fairhead 2016). Local opposition to anti-contagion measures manifested through demonstrations, destructions, and attacks, which the epidemic responders blamed on, amongst other motives, "false beliefs" about epidemic origins. The early fetish stories were soon displaced by rumors of collusion between foreign businessmen, the national elite, and health workers, harbingers of death and crisis-profiteers who came to be known locally as *gens d'Ebola*, or "Ebola people" (Somparé 2020). It thus became crucial for the responding institutions to find the source of the outbreak in order to resolve sociopolitical tensions, and in April 2014, field investigations were initiated in the suspected epicenter of Meliandou. They raised the "plausible" hypothesis that the epidemic originated in contact between the first case, a boy barely two years old, and a bat (Marí Sáez et al. 2015:19), triggering a chain of transmission from human to human. The evidence was however not conclusive, at a time when specialists complained that "the reservoir(s) and ecology of [Ebola] remain largely unknown" (Leendertz et al. 2016:18). This was – and still is – the case although Ebola has become associated in scientific circles and the media with the fringes of degraded African forests, where hunting and logging would bring people close to a hypothetical reservoir of fruit bats.

The unprecedented scale of the 2013–2016 outbreak paved the way for broad investigations. Over the next five years, US, French, and Russian consortiums, and the World Organization for Animal Health sent teams to scour Guinea and other African countries, where they captured and sampled tens of thousands of animals: bats, rodents, cattle, goats, dogs, etc. This article is based on sixteen months of ethnographic fieldwork with Guinean staff of the "industry of viral hunting" (Bardosh 2016: 6). Through participant observation, I enquired into One Health, an agenda that addresses human, animal, and environmental health together, which began to influence health systems governance and the economy of foreign aid in West Africa after the Ebola epidemic. By describing and analyzing the conditions in which costly lab technologies, communication material, salaries, and people clad in biosecure equipment were deployed for One Health, I argue that the hypothesis of a bat reservoir of Ebola has taken on a heuristic role in that it orients the scientific quest for certainty. Those who propagate the bat reservoir hypothesis must handle it carefully or even conceal it, and, as with a fetish, this has the effect of polarizing relations between people.

In Guinea, and generally on the Upper Guinea Coast, the Pidgin word "fetish" refers to artifacts which protect their users against outside threats through occult power (Colleyn 2004; Paulme 1954). In Mande languages, these artifacts – which entangle vegetal and animal matter, molded through the sacrificial pouring of organic fluids (Kedzierska Manzon 2019) – are referred to as "medicines" because of their ambivalent agency, both harmful and therapeutic. Despite the ascendency of Islam and colonization, "power objects" (McNaughton 1988) are fabricated and owned by ritual specialists called *féticheurs* in French. These regularly make the headlines with stories of ritual killings for the benefit of politicians and businessmen. Tales like that told by Norbert straddle the realm of Mande cult objects, the sacrificial logics of witchcraft, and rituals of ancestor worship: they are exemplary of the work of blurring boundaries typical of fetishes. Because Guinea's first independent leader Sékou Touré was concerned about the influence of rumors and practices of the occult over the non-Islamized people of Forest Guinea, he ordered a campaign of "demystification" in 1961 (McGovern 2012). The masks animated by men's and women's initiation societies were raided and burnt in public. Religious rituals, artifacts, and even the sales of inedible animal parts on markets were banned as manifestations of "fetishism" in Touré's Marxist language, which cast Forest cosmologies as secretive, oppressive, and backwards (Sarró 2007:227). In the postcolonial context, power objects have become largely invisible, despite a revival of initiation ceremonies after Touré's death in 1984. I thus treat the fetish as an

epistemology of truth – always "underneath things" (Ferme 2001) – whereby the visible world is presumed to be activated from beneath the surface of words, things, and people. This epistemology of truth is entangled in historical processes of suspicion, dissimulation, and social stratification, expressed through socialities and lived presences.

This article is no ethnography of fetishes as they are presently produced and lived in Guinea, nor does it take an in-depth look at human-bat relationships. Ethnographically, it elucidates the way in which the post-Ebola apparatus of One Health buttressed the hypothesis that certain bats act as epidemic "rogues" (Fairhead 2018). Reflecting on this process in combination with the grammar of the fetish means refraining from a critique of the constructedness of the reservoir hypothesis, which would only reverse colonial mocking of fetishes. The idea of an Ebola bat reservoir is certainly the outcome of scientific work which mobilizes multiple social forces, interests, and technologies, and thus is a fabricated fact (Latour 2010). But I would rather approach the space of doubt that the hypothesis opens within a certain "epistemology of truth" (Bonhomme 2019), that is to be taken seriously in the sociopolitical context of Guinea. The reservoir notion orients investigations into the origins of Ebola following a heuristic of the fetish. This mode of probing is intent on both signaling and adumbrating the difference between truths and fictions, and emphasizes the alterity between "Ebola people" and "village communities," which Abdoulaye Wotem Somparé showed was driving the Ebola response (2020).

After detailing the recent convergence of scientific interests onto researching bat pathogens in so-called disease hotspots in the next section of this article, I explain how the labor and security of the technicians working with bats was changed by the Ebola outbreak. I then examine how the notion of a bat reservoir of Ebola further divided people in Guinea. I emphasize throughout that scientific quests transform relationships between people and species on the margins of evidentiary mechanisms. Acknowledging the uncertainty about how unprecedented events like the 2013–2016 Ebola outbreak happened further nuances our comprehension of how certain places come to act as disease hotspots.

The bat hypothesis

In April 2014, veterinary epidemiologists and ecologists from the Robert Koch Institute in Berlin traveled to Meliandou (Marí Sáez et al. 2015). To investigate the source of the outbreak, they queried how humans interact with wildlife, and whether the latter was pathogenic. They heeded a prevailing consensus about Ebola spillovers (prevailing at least until 2021, when flareups drew attention to the role of survivors in causing outbreaks, Fairhead et al. 2021): that they have a zoonotic, i.e., animal origin. But no trace of Ebola could be found in any of their wildlife samples. The experts relied on observations and interviews to suggest that the boy known as the first case may have infected himself while playing near a hollow tree where insect-eating bats roosted (Marí Sáez et al. 2015:17). Thus emerged the hypothesis that the outbreak was caused by a single bat.

The finding, presented by the scientists themselves as "plausible," was consecrated in the international media as a success story of uncovering the origin of Ebola (Quammen 2015). However, the idiom of discovery does not do justice to the four-decade-long empirical work that entrenched, before 2013, the paradigm that certain bat species act as Ebola reservoirs in regions of the world known as hotspots, where a diversity of animal species are threatened by environmental change. Anthropologists Hannah Brown and Ann Kelly have seized the concept of the hotspot (2014) to attend to the messy entanglements between humans and nonhumans that drive the movement of pathogens and may cause epidemics. As alternative hypotheses start upending the postulates of the Ebola hotspot – precisely such that epidemics of zoonoses arecaused by interspecies intimacy – it is crucial to attend to how scientific propositions about disease hotspots, however fragile, are assembled and configure social relations where laboratory and field converge.

The study of Ebola's source through animal sampling is indebted to the idea that the virus lays hidden and survives in wild animals. Back in the 1970s–1980s, the search for Ebola's reservoir encompassed invertebrates, birds, antelopes, primates, and other small mammals (Arata and

Johnson 1978). Since the 2000s however, scientific scrutiny has concentrated on bats. Genetic material of Ebola virus and antibodies were isolated in several species of fruit and insect-eating bats over the last couple of decades (Leendertz et al. 2016). An international team of researchers entitled one early publication, based on microbiological analyses, "Fruit bats as reservoirs of Ebola virus" (Leroy et al. 2005), later finding epidemiological confirmation when they traced an outbreak in the Democratic Republic of the Congo to purchased fruit bat meat. To ecologists however, the presence of biological material in bats does not determine the animal's capacity to replicate and shed the virus, i.e., to act as a reservoir. They mostly agree that the nature of the Ebola reservoir "remains elusive" (Leendertz et al. 2016; Ohimain 2016:5) and speculate on the species – likely in the plural, and including bats – implicated in maintaining Ebola in some places (Caron et al. 2018). Due to bats' exceptional immunology, scientists acknowledge that the hypothesis will be, as a minimum, difficult to prove (Peeters et al. 2021). But such epistemological precautions were lost when the hypothesis took a life of its own after the West African epidemic led to an upsurge of interest in Ebola.

In 2014, the cautious conclusion of investigations in Meliandou bolstered a growing consensus that some zones act as "Ebola virus ecological zones" (WHO 2016). This view is the by-product of the expanding use of modeling and remote-sensing technology in scientific research beyond the military sector (for example Pigott et al. 2014). To inform predictions about areas at risk for the disease, satellite observations of vegetation, altitude, and temperature are combined with maps of species distributions and the limited series of Ebola outbreaks (about thirty since the first record in 1976) using machine-learning algorithms. The complex relationalities predicted to cause outbreaks are then described by portmanteau nouns such as "enviroclimatic factors" (Buceta and Johnson 2017:1), "zoogeographical descriptors" (Olivero et al. 2017:24), and "anthropogenic settings" (Olivero et al. 2020:7). A recent map of susceptibility to Ebola spillovers in Forest Guinea (Lee-Cruz et al. 2021:1), for example, shows risk to be influenced by "environmental, climatic and anthropogenic risk factors" such as loss of forest cover, rainfall, bat species, hunting, and bushmeat trade. Upon a closer look, calculations of the "pixel value where the village of Meliandou [. . .] is located" (Lee-Cruz et al. 2021:11) do not point to the site where the virus allegedly spilled over in 2013 as among the most highly susceptible to Ebola. Areas of higher risk, according to the map, are located a few hundred kilometers to the south, in the vicinity of former colonial forest reserves, recognized by UNESCO in the 1980s: the Mount Nimba Strict Nature Reserve and the Ziama Massif Biosphere Reserve. For at least 10 years, conservation biologists have singled out Nimba and Ziama as relics of the Upper Guinean primary forest, "irreplaceable biodiversity hotspots" (Monadjem et al. 2016:359) with "important habitats for threatened and endemic mammals" (Mamba et al. 2021:127), whose populations are regularly surveyed. The susceptibility map lights up around these forested places likely because they host bat species in which Ebola antibodies were once detected, are close to bushmeat hunting areas, and are fragmented by cropland (Lee-Cruz et al. 2021:19). Biodiversity hotspots are increasingly seen as hotspots of emerging infectious diseases through scalar constructs that may obscure the actual geography of disease emergence.

Although microbiology, epidemiology, and ecology admit different standards of evidence, they collaborate around the problem of Ebola's causes and meet around a hypothesis that links Ebola outbreaks with the life cycles and migration patterns of bat populations in forest fringes threatened by deforestation. The truth of this hypothesis is never assessed in itself for it has come to function as a heuristic for investigations. Overlapping biodiversity hotspots and disease reservoirs (Allen et al. 2017), this product of modeling has begun to orient research in the field, which was previously based on epidemiological data. It is no wonder that when the Robert Koch Institute scientists asked Meliandou's officials where they could capture bats, they were not advised to comb the village but pointed in the direction of "two relatively distant regions of southeastern Guinea" (Marí Sáez et al. 2015:19), including the Ziama reserve, about 130 kilometers away. Virus sampling has followed on the heels of the bat species surveys that have been conducted since colonial times in sites that host a diversity of animals.

In 2014, Forest Guinea became the crux of a "contact zone" (Pratt 1992) that involved veterinary epidemiologists, conservation scientists, and inhabitants of the region. At the heart of this contact zone, a flurry of stories gravitated around Meliandou's tree and its insect-eating bats. The tree takes center stage in the scientific article, where three photographs zoom in on it and an arrow indicates a wooden stick half disappearing into a crack, "most probably left there by children" (Marí Sáez et al. 2015:19), like a smoking gun. The scientists report that, four months after the spillover event occurred, on March 24, the massive tree caught fire (Marí Sáez et al. 2015:19). A German ecologist claimed that the tree was "immediately torched" by "scared villagers" after they came to see it as the origin of the disease (Goergen 2018, my translation). He feared that this seeming act of revenge exposed people to further outbreaks. Anthropologist Almudena Marí Sáez (2019), in a conference presentation, proposed another explanation: the tree, which happened to host beehives, would have been accidentally set alight by a match, constraining the scientists to collect samples of ash in and around the burnt trunk. The tree itself seems to be a silk cotton tree (*Ceiba pentandra*), a species historically planted by the Kissi founders of new settlements and a place of ancestral sacrifices, where burning is normally forbidden (Fraser et al. 2014:1232). Many of the bat samplers I met wondered: "Why burn the tree and the bats?" While on a mission to Meliandou, they dared to ask the youth representative appointed to mediate between them and the population. The man answered that a "German scientist" handed them money to buy a jerrican of petrol and burn the tree before gratifying them with kola nuts – implying that evidence had been willingly destroyed.[2] What truly happened did not matter to the samplers, who understood when to stop asking questions, leave things vague, and doubt official narratives.

The centrality of contact zones in making fetishes was highlighted by anthropologist Patricia Spyer (1998). In West Africa, fetishes were historically owned by chiefs and elders only. They are nowadays decried as an expedient through which the civil and military authorities acquire and maintain control over the population. The first democratically elected president Alpha Condé was rumored to resort to their power, before himself falling victim to a coup, in September 2021, which staged a "military féticheur" (Camara 2021). Fetishes "open up the possibility for cultural criticism" (Spyer 1998:3) through enabling commentaries on hidden actions, malevolence, and credulity. In Meliandou, an array of agencies and intentions were discussed in relation to the tree that took center stage in Ebola research: it was a lost chance to find decisive microbiological evidence; a symptom of environmental destruction through human-made fires; a bad omen for bats accused of carrying diseases; a memory of the ostracization that Ebola brought upon affected communities; and a troublesome sign of foreigners' interest in extracting all sorts of resources from the region – rubber in the past, then cash crops, blood for biomedical research, and now, wildlife samples. This is not to say that scientists and locals erroneously "fetishized" a tree and its bats. Rather, scientific investigations played into an aesthetics of truth, which made the hypothesis of a bat reservoir a collective act of embroiling people, discursively and practically, in dissimulation and retaliation. Weren't fetishes burnt by the agents of Touré's demystification campaign precisely because they were not sure whether or not the artifacts were fake?

These insights trouble understandings of outbreak investigations in hotspots. The proposition of a bat reservoir is not only a case of big data ecology being buttressed by epidemiology and infectiology and harnessed by conservation scientists to preserve Guinea's wildlife. If looked at and questioned from the site of its making, the idea of a reservoir emerges in encounters between scientists, bat samplers, and villagers, in insinuations and mutual accusations. Knowledge about disease origins cannot be detached from an epistemology of truth and forms of sociality steeped in a violent history and enforced through sanitary interventions. This is a grammar that, after the Ebola outbreak, the Guineans hired to sample bats had to navigate.

Working with bats, before and after Ebola

Just before sunset, Guineans employed for bat research – veterinary doctors, biologists, forest wardens, administrators – take heavy crates from a four-wheel drive. They walk in single file to a rice swamp, a slit in a mossy rock, or a house with a corrugated iron roof. They plant a few poles and pull taut large

polyester mist nets, like those used by ornithologists. As dusk sets in, one bat, then two, swoop from their perch, fly down into the net and tangle up. Capture! Before they snarl up too tightly, one person puts on gloves, a face mask, sometimes a hazmat suit, and disentangles them. Once transferred to a plastic table in an area delimited by security tape, bats are weighed with a portable scale. Their sex, age, and species are determined, from observations or with the help of an identification sheet. If their job requires taking samples, the fieldworkers insert cotton swabs into each animal's mouth and anus, and puncture their brachial vein to collect a few drops of the blood that spills across the wing. Some projects prescribe chemical euthanasia to export specimens of new species or to test their organs, which might harbor viruses otherwise undetectable. It has however become common practice to release the animals alive, once handled.

Scientific fascination with bats dates to the eighteenth century, when naturalists started collecting and sketching them to build taxonomies (Griffin 1986; Keck and Morvan 2021). Early experiments were conducted on bats' capacity to orient themselves in the dark, and their migrations began to be studied in the twentieth century. Chiropterology expanded tremendously in the last decades, with booming research in acoustic ecology, species diversity, on bats' pathogens and their immune system. In 2019, I met in Conakry two of the few Guinean professionals who present themselves as chiropterologists. Pé and Tamba, who both came from Forest Guinea and held degrees in zoology and protected area management, were among the first to be involved in bat research.[3] At the beginning of the 2010s, they were employed by the conservation NGO Guinée Écologie to monitor by binoculars the migrations of straw-colored fruit bat populations, a bat species categorized as Near Threatened by the International Union for the Conservation of Nature. Pé and Tamba were also instructed to "raise awareness" in the island populations, off the coast of Conakry, that lived near bat roosts. With the help of pictures, they explained that bats guarantee the "environmental balance" through dispersing seeds, controlling insect populations, and leaving droppings as "free fertilizer" for humans to collect. The chiropterologists had developed a keen interest in bats' welfare as a value in itself, and repeated that "bats have a right to exist, like any godly creature." But the services these animals render to humans were a crucial economic argument in education sessions, one even more important as, in 2012, the two men were derided by islanders. They were oftentimes asked, bemusedly: how could two grown-ups attach so much importance to these animals?

Many people, in Guinea (Frerot 2020) as in other West African countries (Cros 2021), surely engage with bats. Fruit bats are hunted in rural localities of Forest Guinea, mostly opportunistically at the end of the dry season, and consumed by modest households with the sauce that accompanies rice dishes. Chasing, killing, and roasting bats is moreover a seasonal game for the children tasked with controlling animals that prey on crops. As for the smaller insect-eating bats that roost in ceilings, known by a different name in most languages of Guinea, they are a source of noise, droppings, and urine, so much so that a repertoire of techniques exists to force them out of roofs, such as by burning the shells of groundnut harvests to suffocate them. Still, fruit bats and insect-eating bats maintain a discrete presence in the region overall – in people's lived environment, protein diet, economic practices, and cosmologies. This may elucidate why Tamba and Pé were mocked and sometimes hailed as "bats" themselves – animals that chiefly captivate the young and bother the poor.

This landscape of engagement – interhuman and interspecies – dramatically changed in 2014 when the idea spread that bat consumption triggered the Ebola epidemic. Guinée Écologie's representatives were invited to workshops on the topic of bushmeat consumption at the Ministry of Environment, Waters, and Forests. The entire chiropteran order was blamed by national authorities with, the delegates decried, no scientific knowledge. As Tamba told me in 2019, vibrating with outrage: "senior executives from the Ministry of Environment think that bats are birds, and shit from their mouth!" In 2015, Guinée Écologie founded a chapter of Bat Conservation International, an organization created to end bat extinction worldwide. BCI sponsored a "debate on bats in Guinea" on the national television channel to warn people to leave bats "in their natural space," while scientists work "to establish the truth" about Ebola (RTG 2016). Meanwhile, other conservation institutions formed consortiums for virus hunting. Ebola antibodies were detected in straw-colored fruit bats by sampling teams led by Pé,

who now worked exclusively with French virologists (De Nys et al. 2018), while a new species of Ebola, the Bombali virus, was found by the US-funded PREDICT project in Angolan free-tailed bats of Sierra Leone and Guinea (Goldstein et al. 2018). The Ebola outbreak worked to reconfigure bat research, as microbiologists now overshadowed zoologists and public health trumped conservation.

The Ebola epidemic also transformed bat research in Guinea in that it made such work a high-risk undertaking in some localities. From 2014 onwards, the technicians hired to sample bat pathogens feared being mobbed. It was whispered in certain places that samplers injected viruses into wildlife, like the Ebola response workers suspected of murdering the sick to trade their organs (Somparé 2020). Samplers understood that these narratives implicated the protective personal equipment (PPE) they wore. PPE resurrected the painful memories of 2014–2015, when health workers took sick people to Ebola Treatment Centers against their will, where a great many died and were inhumed in plastic shrouds "like fagots of wood" (Le Marcis 2015). When in 2017 they donned hazmat suits in their sampling sites, PREDICT employees were welcomed by cries calling for retaliations: "the men in white have returned!" "beware, they wear clothes like Ebola people." It was the case, I was told, in the Forest Guinea commune of Soulouta. As three samplers prepared themselves, bystanders vanished, women locked themselves inside their homes, and men armed with stones, machetes, and *grigris* (a pejorative word for fetishes) rushed toward them. The samplers owed their lives, they told me, to the ingenuity of their driver, who swiftly opened doors for everyone to jump into the car, and shot off. The cyborg bodies that practice epidemic preparedness with protective technologies are already vulnerable. But bat samplers were not only impeded and exposed by PPE. They felt threatened because they were attributed with the malevolent intentions associated with the former outbreak responders.

Samplers resorted to dissimulation and selective ignorance to deflect tensions. Stripping down PPE to a minimum, they sometimes labored in gear below the biosecurity protocol. Whenever possible, they drove the bagged bats to a closed space deemed safe for lab work, such as the courtyard of their guest house. Only their local guides were welcome to observe the team, far enough away that they would not be exposed to the animals or their fluids. Some villagers asked for the fleshiest bats after sampling so they could feast on them. But this would have been a mistake on the part of people hired to look for bat viruses. In the educational work that samplers carried out, and as they shed references to conservation in favor of a One Health approach, they now failed to mention the benefits of bat feces to their audience and insisted on the necessity to abandon bat consumption. When, in August 2019, the time came to communicate about the newly found Bombali virus, PREDICT Guinean managers were reluctant to admit in public meetings that Bombali was indeed a species of Ebola virus, related to the one that wreaked havoc a few years before. They did not reveal the locations where the positive bats were captured to the anxious few who asked. Such an aesthetics of concealment is embedded, in the region, in centuries of slave trade, warfare, and a hierarchical economy of knowledge (Ferme 2001; Shaw 2002). In postcolonial Guinea, the habitus of dissimulation long cultivated by initiation societies powered Sékou Touré's spying apparatus and led to recurrent blaming of foreign conspiracies, a denunciation still recurrent today (McGovern 2017). The strategies of bat samplers also echo the invisibility tactics attributed to West African hunters, who were hired to evade opponents by militias during the civil wars in Liberia and Sierra Leone.

It was not infrequently that samplers ran into some of the cosmologies usually associated with hunters and traditions. The elderly owner of a house next to which they set up their nets once angrily asked them to leave, because the bats in his roof were grigris and guaranteed his protection. Samplers were dissuaded from working in caves when ceremonies were planned. This happened when an influential elder died in a village close to the Ziama forest, likely the head of an initiation society who was introduced to me as a "famous féticheur." The sampling team and I were advised to keep to our guest house that night, not to cross paths with the masked creature due to parade and spread the bad news, which ought not to be seen by the non-initiated. In yet another neighborhood, I was discreetly ushered out as samplers and I inspected a house's ceiling to look for traces of bat urine. One colleague had glimpsed an altar in a bedroom corner, something like a statue stained by the red remains of kola nuts, and a prudent retreat was prescribed. The middle-class Guinean graduates employed by

PREDICT, who normally lived in cities and practiced a monotheistic religion, saw all such fleeting encounters as fetish, whether they pertained to the cult of ancestors, initiation societies, idiosyncratic beliefs, or were artifacts designed to constrain the will of others. Aware of past politics, they handled these frictions with discretion and respect for the conditions posed by their interlocutors. There were things unknown and dangerous that they ought to keep quiet about.

Nonetheless, these things, which samplers also called "African mysteries" with a faint snigger, were less threatening than animosity against the very hypothesis that underpinned their quest. The hypothesis of a bat reservoir, articulating tremendous resources and interests like a fetish, moved scientists, technicians, and Forest Guineans to interact in new ways and became a causative agent in itself. In neighboring Sierra Leone, anthropologist Michael Jackson (1998:75–82) argued of fetishes – knotted strings, crumpled pages of Koranic verses, dried leaves kept in cases – that they secretly bind and enclose enemies. For samplers, protective equipment and tactics of concealment comparably acted to "withhold or prevent communication" with residents, while "bolstering the power of [their] will" (Jackson 1998:78–79), especially in situations where they felt jeopardized by the ill will of bystanders. A certain relationship to truth pervaded the making of the hypothesis of a bat reservoir amid efforts to hide sampling labor and its results.

The Ebola reservoir

In the end, the idea that some bats carry Ebola without having symptoms and transmit it – a summary clarification used by samplers to translate the expression of "disease reservoir" – was accommodated by many Guineans. That this notion is at odds with many West African views about zoonoses has already been highlighted (Bonwitt et al. 2018). Not only is wildlife generally perceived as healthier, but a major counterargument also emphasizes that bushmeat has been consumed for generations without ever appearing to generate epidemics. By 2014 however, bats – especially fruit bats – were becoming rarer than a few decades before, and much epistemic work went into drawing conclusions about this absence and the supposed origin of new diseases.

I gathered this assessment from Pé, other samplers, and state employees, all involved in the meetings organized since 2016 in Forest Guinea for furthering a cross-sectoral One Health approach to epidemic preparedness. Their views about the Ebola reservoir were those of people who self-identify as *scientifiques* (scientists) for having received secondary school education at least. Sékou Touré had envisioned a Guinean nation enlightened by his version of scientific socialism, where class struggle would be replaced by opposition between those into "African fetishism" and those who reject it (McGovern 2012:19). The scientifique status, supposed to tear away the educated from the superstitious unschooled, still speaks to a major aspiration of the Guinean middle-class, that of a modern, outward-looking self-consciousness. Bats may have become ever more discrete in the lifeworld of educated urban dwellers – if assuredly not of everyone. But far from downplaying the animals' association with Ebola, this absence motivated Guinean scientifiques to reflect on the novel discourse about zoonosis against the unschooled mass.

According to urban Guineans, fruit bat populations have dwindled. The large bats, the only ones hunted and traded for consumption, are today hardly available as fresh game in urban markets. They can mostly be found around February – March, when many are imported, already smoked, from northern Guinea. By contrast, insect-eating bats have flocked to village houses, where they roost under sheet metal roofs. Chiropterology research in Guinea does not provide conclusive evidence of variations in colony sizes and populations movements, which are, for that matter, very difficult to establish. But according to conservation specialists (Dufour et al. 2013; Duonamou et al. 2021), large wildlife populations are generally declining in Guinea. Threats to bat species, through mining and agriculture, have been flagged (Monadjem et al. 2016). As discussed earlier, such threats might be connected with an increased risk of spillover in the discourse on hotspots, but in the very place of emergence, the absence of bats was not immediately reconciled with the proposition that they act as the disease reservoir.

In April 2014, trade and consumption of anything known as *viande de brousse* (bushmeat) was banned in Guinea. It was in fact the most influential Ebola prevention message in the first year of the outbreak, before any recommendation for halting contagion. The many surveys conducted to assess the policy's effects report a marginal decrease in bushmeat trade, but the consumption of bat and primate meat did come to a noticeable halt despite misgivings about the ban's rationale and distrust in the Ebola response (Bonwitt et al. 2018; FAO 2015). I even heard that the stalls of tradeswomen selling bat meat were attacked by young men, in 2014, in a city near the Ziama forest. Fast forward three years later, and bushmeat has become easy to source again. While many consume it, many others claim not to eat bats, or at least not anymore. Bats are not only a rare sight on markets, some worry about the risk of disease, and even more cite disgust as a reason for not consuming bats (Dramé 2018:16).

The ethnic groups that claim autochthony in Forest Guinea – non-Islamized minorities – are stereotypically known for eating anything, even foods that others consider repulsive such as monkey (McGovern 2017). In fact, consumption of hunted animals is a transethnic phenomenon in the country, and depends on residence and purchasing power rather than religion (FAO 2015:5). But since colonial times, the people who hunt and consume undomesticated species have been deemed savage by those who politically dominate them. This prejudice became more salient during the socialist period, when these food habits shored up the claim of the Muslim Maninka to rule over the rest. When the Ebola outbreak started, such aesthetics of disgust found confirmation in the imputation that bushmeat consumption constitute a risk of disease. Some political leaders from Forest Guinea, such as Jean-Marie Doré, even denounced the bushmeat ban because it stigmatized their ethnic group and blamed them for the epidemic. The hypothesis of Ebola's source became a problem with certain humans transgressing separations from certain species.

In Forest Guinea, the bushmeat category was further negotiated to enforce more refined distinctions. The Minister of Health and Public Hygiene during the epidemic, a Kpelle man from the Forest, declared in 2014 that bats, the "only virus reservoir," are to be avoided; monkeys are "theoretical" carriers that "no scientific study has proved to present a risk" (Bah 2014). The Ebola virus would be killed by cooking temperature or sunlight, with the result that smoked meat can safely be eaten (BBC News Afrique 2014). Bushmeat could be unhygienic if not handled properly, imperfectly cooked, or when it is the meat of bats or rats. In PREDICT communication discussed above in contrast, there was no condoning the consumption of adequately cooked bats: after debating the risk of provoking their audience, samplers decided to strictly advise against eating bats. In remolding the bushmeat category for a mostly non-scientifique audience, scientifiques drew the line at certain species, refining a hierarchy based on foodways.

In administrative offices, the bat origin of Ebola was endorsed because it confirmed existing framings of game depletion. Employees in N'Zerekore departments of Environment and Forestry were prone to attribute bats' evanescence to deforestation. According to a warden I met, logging, slash-and-burn agriculture, and firearms overuse force bush animals to retreat deeper into the Ziama forest, where he was posted. Amplified since the 1990s by conservation programs, this simplified story indicts land-use practices as environmental mismanagement on the part of Forest Guineans (Fairhead and Leach 1996). Another story for game depletion tapped directly into the ethnic politics of foodways. "*On a tout bouffé!*" (We ate them all up!), the regional director of the Environment told me, accompanied by the laughter of his Kpelle colleagues, who confessed their taste for a "sweet" meat said to bolster strength and health. As he defied, with some humor, the white researcher whom he assumed to follow hygienic prescriptions, he explained to me: "I am not scientifique as I say these things! I put myself in the peasant's shoes." While, like many administrators, he had enlisted in the Ebola communication taskforce, he always stopped short of discussing the bushmeat ban during public meetings because of his own ambivalent attitude. In 2018, the list of protected species was revised to cover those of the international conventions to which Guinea was a party. The administrators did not seem to know that some bats were now legally protected, but they assured me that bat meat would still be seized by market controllers, not to protect bats but "given past events." The reservoir hypothesis acted like a boundary object, which the Francophone and the educated seized to

affirm or qualify their social status, depending on the circumstances, and in keeping with an immanent order of dissimulation.

It was also reconfigured by field-based scientific practices, as bat sampling efforts were oriented by the heuristic of the animal reservoir. Research on Ebola's ecology is generally directed by the sheer need to find biological material to extract and analyze, even hundreds of kilometers away from the outbreak site, as during investigations in Meliandou. Disease ecologists havenoted that, in situations where the reservoir host is poorly known, sampling is "often opportunistic or haphazard and is guided by sparse information" (Plowright et al. 2008:1). PREDICT elected to focus their resources on Forest Guinea as a whole, a region where bats are (still) available and that program managers took to display "zoonotic disease drivers" of epidemic emergence. In the end, sampling sites were chosen based on the epidemiology of the 2013–2016 outbreak in humans: locations with declared Ebola cases were picked, and sites with no case were picked as control sites. As we saw however, scientific publications (Gire et al. 2014; Marí Sáez et al. 2015), as well as common understandings in Guinea, unequivocally ruled out animals playing a role in the spread of the disease beyond the supposed spillover. When I enquired about this contradiction, I was told that the project would find out whether bat consumption sustained the outbreak among Forest Guineans. Wherever possible mist nets were positioned close to the homes of Ebola survivors, even though all had been infected by sick people. PREDICT samplers insisted that survivors, knowing that the disease was a "real" health problem (i.e., not a conspiracy), were generally more hospitable to post-Ebola projects, as they depended on their aid.

The sites chosen for animal sampling reflect the notion that the disease inheres in specific places, rendered disease-prone by the lifestyles of their inhabitants. A political ecology reading of this sampling geography would point to misrecognition of the socio-environmental causes of Ebola, substituted by fetishistic investment in the bat hypothesis. But thinking with the fetish as a heuristic with its own grammar, one that tends to order people on a scale of modernity, suggests that the notion of disease reservoir is, in the end, thoroughly reworked by novel iterations of ancient prejudice. It becomes an instrument of governmentality through being reconfigured by mistrust, disgust, and disbelief.

Conclusion

In this article, I foregrounded the hypothesis of an Ebola bat reservoir as one of the significant legacies of the 2013–2016 West African epidemic, both in scientific circles and in the areas hit by the disease. In the dark of the night, around the field lab set up by technicians to sample bats, a discursive and material artifact was constructed in a joint effort of biosecurity, wildlife conservation, and One Health. To reflect on the ways in which the hypothesis of Ebola's source came about, I bring together insights from the anthropology of zoonoses and that of West Africa.

The bat reservoir hypothesis is contoured, in Guinea, by ethnicized prejudice about the hygiene of Forest Guineans and their role in environmental degradation. A powerful and frightening hybrid, it is manipulated by middle-class scientifiques intent on signaling, or rather insinuating that they are different from the people who hunt and consume bats. In the end, the bat does act as an "epidemic rogue" (Fairhead 2018): a threat forever unknowable, it justifies a preemptive logic that entangles, somewhat contradictorily, culling, protecting, and testing bats. But this does not overdetermine the way people act toward the animal. Said simply, some Guineans may not eat bats, not because they can give diseases, but because they are "disgusting" and only uncivilized people eat them. Understanding zoonoses as diseases with animal reservoirs means searching for and fearing the immoral relations with non-human animals that make humans sick – like when seeking fetishes to ridicule their owners.

If we were interested in tracing the network of forces on which science depends to be established and maintained, we could say that the translations that made the bat reservoir of Ebola a fact are incomplete. The bats of Forest Guinea are elusive, the evidence is unconclusive, Forest Guineans are suspicious, and samplers are cautious. But a different approach is adopted here, one that folds descriptions of the precarious negotiations that cement the bat hypothesis into a historical

epistemology. The grammar of the fetish – the rules that people use both to fuse and separate true and false – directs the attention of those who look for the cause of Ebola. Therefore we do not only come to a better grasp of how disease reservoirs are made, but also realize that because knowledge about them is always imperfectly constructed, they are likely to be vested with epistemological significations, i.e., particular attitudes toward the making of said knowledge. In today's context, where the cause of pandemics of emerging infectious diseases such as COVID-19 will remain ineluctably uncertain, this finding should not be dismissed as inconsequential. It could indeed constrain the ability of technologies of surveillance to warn humans about the risk of certain diseases, if and when animals do play a role in their emergence.

Notes

1. Serological surveys show Ebola to circulate in the region since the 1980s at least, so that previous outbreaks may have been ignored or misdiagnosed (Benton and Dionne 2015).
2. At approximately the same time in nearby Gueckedou, the first major city affected by the outbreak, other scientists, from the Bernhard Nocht Institute for tropical medicine in Germany this time, were deployed to help with diagnostic capacities.
3. All names used are pseudonyms.

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