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Inventing Africa – How a microbe changed a continent

Which is more authentic: a game-rich wilderness or a cattle pasture?
***Fred Pearce** traces the birth of a myth.*

MOST of us have a vision of "primeval" Africa as it was before Europeans arrived: of bush teeming with wildebeest and elephants, lions and zebras. We've seen it on TV in endless wildlife documentaries filmed in the continent's many national parks.

That vision is largely a myth. Pre-European Africa wasn't like that. The great parks are, in truth, as artificial as an English country garden – and Africa's gardener, the force that shaped today's landscape, was a microbe. The day it reached Africa, just over a century ago, the continent changed forever. Before, sophisticated kingdoms thrived, boasting navies, art and music, elborate court etiquette and international trade. After, there was the bush.

The transformation began with a small invasion. An Italian expeditionary force was making one of its periodic forays into the Horn of Africa. The soldiers didn't get far, but the livestock that accompanied them carried a vicious hitch-hiker – a catttle virus that causes a disease called rinderpest. As it spread, it ripped apart cattle-rearing kingdoms across the continent, opened the door to colonial invasion, and left behind a depopulated tsetse-ridden bush that Europeans mistakenly saw as the primeval landscape of wild animals and primitive people. To this day, hardly anyone outside academia is aware of the calamity, even though – as with the slave trade – it was the Europeans who reaped the rewards.

The rinderpest virus is a close relative of measles and canine distemper. Native to the steppes of central Asia, it periodically swept through Europe, usually spreading with cattle being moved to feed armies during military campaigns. The devastation matched that wreaked by its compatriot Genghis Khan. In Africa south of the Sahara, however, rinderpest was unknown, probably because camels, the only animals to cross the desert, were not susceptible.

But in 1887, the "cattle plague" appeared suddenly in Eritrea at the site of the Italian invasion. It spread through Tigre in Ethiopia in 1888 and then followed ox trails south along the Rift Valley and west across Sahel herding routes via Sudan and Chad into West Africa. It took just five years to reach the Atlantic, and within a decade it had arrived in South Africa. "For pastoral people, it was a devastating experience – the mortality rate in cattle was upwards of 90 per cent", wrote John Rowe, a historian from Northwestern University in Evanstown, Illinois, in a 1994 study of the great pandemic. One Masai elder in East Africa later recalled that the corpses of cattle and people were "so many and so close together that the vultures had forgotten how to fly."

The British colonial authorities in southern Africa tried to halt the passage of the disease by erecting a 1,500-kilometre barbed-wire fence and shooting infected cattle. But by the end of 1897, "even the animals on Cecil Rhodes' estate near Cape Town were dying", says writer and historian John Reader. By the end of the century, most of the cattle in southern Africa had died, a toll estimated at 5.5 million.

The pandemic has been called the greatest natural calamity ever to befall Africa. No native animal had a trace of immunity to the disease. "Never before in the memory of man, or by the voice of tradition, have the cattle died in such vast numbers; never before has the wild game suffered ... The enormous extent of the devastation can hardly be exaggerated", wrote Frederick Lugard, a British army captain who travelled the caravan routes of Northern Kenya in 1890 while scouting for an invasion of East Africa. Rinderpest only targets cloven-hoofed animals, but indirectly it devastated the human population, too. Herders had no llivestock. Farmers had no oxen to pull their ploughs or drive the waterwheels that irrigated the fields. Hungry populations fell prey to native diseases such as smallpox, cholera and typhoid, as well as new ones brought by the Europeans. No modern researcher has estimated how many people died overall, but comtemporary accounts from across the continent reveal the scale of the catastrophe.

"Everywhere the people I saw were gaunt and half-starved, and covered with skin diseases", wrote Lugard. "They had no crops of any sort to replace the milk and meat which formed their natural diet." In places, epidemics coincided with drought. Between 1888 and 1892, roughly a third of the population of Ethioplia, several million people, are thought to have perished from the combined effect of rinderpest and drought.

John Ford, who once directed the East African Trypanosomiasis Research Organization at Tororo, Uganda, conducted a detailed study in the 1970s of the impact of rinderpest on a region of central Africa west of Lake Victoria. Records in two typical districts, Bukoba and Biharamulo, show the local cattle population dropped from about 400,000 in 1891 to just 20,000 the following year. The result was famine among the Hima in Karagwe and Ankole, the Tutsi in Rwanda and Burundi, and the Soga of Uganda, who all lived almost entirely on a diet of milk and blood. In south-west Africa, the Nama and Herero pastoralists were also starving.

But perhaps worst hit were the Masai in Kenya. Their folklore still tells of the enkidaaroto, the "destruction", of 1891. Most of their cattle died, along with the buffalo and wildebeest of the Serengeti. The Masai were plunged into wars for the surviving cattle and reduced to begging for meat from passing caravans. The Austrian explorer Oskar Baumann, who travelled through Tanzania in 1891, estimated that two-thirds of them died.

"Almost instantaneously, rinderpest swept away the wealth of tropical Africa", says Reader. "The pastoralist aristocrats were ruined. Where herds had numbered tens of thousands, only a few dozen animals survived." British botanist Scott Elliot travelled near Lake Victoria three years after the rinderpest hit. He reported that wars and cattle raids had "produced utter destruction of the community ... The country is completely uninhabited." In northern Nigeria, the cattle-herding Fulani "having lost all, or nearly all their cattle, became demented", wrote Ford. "Many are said to have done away with themselves. Some roamed the bush calling imaginary cattle." Much the same befell the Dinka and Bari in Sudan and the Karamajong in Uganda. Many of these societies never recovered their numbers, let alone their wealth and power.

Rinderpest served up the continent on a plate for Europe's "scramble for Africa" in the final years of the 19th century. In its wake, the Germans and British secured control of Tanzania and Kenya with barely a fight. In southern Africa, the Herero succumbed to German occupiers, and the hungry and destitute Zulus migrated to the gold mines of Witwatersrand, helping to create the brutal social divide between black and white from which apartheid sprang. Lugard noted that rinderpest "in some respects has favoured our enterprise. Powerful and warlike as the pastoral tribes are, their pride has been humbled and our progress facilitated by this awful visitation. The advent of the white man had not else been so peaceful."

But the ramifications of the rinderpest epidemic did not stop there. The cattle disease opened the way for the tsetse fly, which even today is second only to AIDS as an obstacle to Africa's development. The

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tsetse fly lives among wild animals in lowland tropical bush. It carries trypanosomiasis, a disease which is lethal to both cattle and humans, in whom it is called sleeping sickness. Initally, the rinderpest was bad news for tsetse flies, because it killed their hosts. But it soon created an environment in which the flies returned with a vengeance.

Tsetse flies like lush, extensive vegetation where adults can deposit their larvae. Before rinderpest arrived, the cattle on the plains kept the tsetse in check by grazing the grass sward very close and preventing tree seedlings and shrubs from growing more than a few centimetres high. But without cattle and other grazing animals, the woody vegetation grows fast. "Within a season or two, the pasture is transformed into woody grassland and shady thornbush thickets, creating ideal conditions for the spread of the tsetse fly," says Reader.

After the rinderpest epidemic passed, wild animal populations rebounded much faster than the cattle, providing an animal host for the tsetse once more. The flies and the sleeping sickness they carried in turn kept humans and their cattle from returning to graze down the bush that was springing up. In a landscape suddenly highly conducive to the flies, tsetse spread fast.

Ecological revolution

In East Africa in particular, highland areas once free of tsetse and which sustained large populations of herders became tsetse-infected bush and woodland, says Reader. In southern Africa, the tsetse, which largely disappeared from the Zambezi and Limpopo valleys in the mid-1890s as rinderpest swept through, revived from about 1904 and took over its former domain and more, says Ford. From virtually nil it had grown to cover 5,600 square kilometres of the two valleys by 1913 and 47,000 square kilometres by 1930.

For people, the impact was horrendous. Sleeping sickness was unknown in East Africa until the ecological disruption caused by the rinderpest epidemic. But after its arrival in the early 20th century, it caused millions of deaths, which led to large tracts of land being abandoned to wild animals and tsetse flies, says Keith Sones, director of the Nairobi-based consultancy Stock Watch. An estimated four million peope died in Uganda alone.

Rinderpest led to an ecological revolution against people and in favour of wildlife. Africa has never fully recovered. Probably half a million people contract sleeping sickness each year, of whom some 100,000 die. The tsetse fly remains a major obstacle to the economic development of whole regions – often the best, most fertile lowlands that would otherwise make ideal cattle country. These become virtual no-go areas for humans and cattle alike, says John McDermott of the International Livestock Research Institute (ILRI) in Nairobi, who has studied the disease in Uganda. Conservationists have called sleeping sickness "the best game warden in Africa".

As Europeans poured into Africa a century ago, this brushy, tsetse-ridden landscape, newly emptied of people and cattle and teeming with wildlife instead, became the archetype of "unspoilt" Africa. It is no accident that the idea of turning over large areas of empty African savannah into game reserves, first for hunting and later for conservation, took hold in conservationists' minds around this time. "They just assumed that the country they found packed with animals and empty of people was the way that Africa had always been. They thought it needed protecting, and set about making laws to keep the people out. Many of those areas are now tsetse-infested game parks," says Reader.

The decades that followed the rinderpest pandemic were the great years of the hunting safaris to Africa. When Teddy Roosevelt celebrated his retirement as US President in 1909 with a mass safari, his party shipped home more than 10,000 carcasses, most often to the Smithsonian Institution. This orgy of hunting in what Roosevelt called "the greastest of the world's great hunting grounds" made a profound impression on the following generation of scientists. Julian Huxley, head of UNESCO and founder of the World Wildlife Fund (now the World Wide Fund for Nature, the WWF) in the early 1960s, described the East African plains as "a surviving sector of the rich natural world as it was before the rise of modern man".

With this fiction came a faulty notion of African savannah ecology, says Holly Dublin, chief conservation advisor for the WWF in Nairobi and author of a study of the changing ecology of Kenya's Masai Mara National Reserve. The conventional ecological wisdom of the day was that all ecosystems marched towards a "climax" vegetation. And, imagining that the bush they saw was the natural pristine environment of the savannahs, conservationists concluded that the bush was the "climax" vegetation of the region. So they set about trying to preserve it.

In their ignorance, they created Africa's great national parks: the Serengeti and Masai Mara, Tsavo and Selous, Kafue, Okavango, Kruger and the rest, from which they decreed that all humans and their cattle had to be excluded at all costs. "They did not realize that 30 or 40 years earlier it had been open grassland", says Dublin.

The German biologist Bernhard Grzimek, writer of the book *Serengeti Shall Not Die* and director of the film of the same name, worked indefatigably to keep the Masai out of the Serengeti. "A National Park must remain a piece of primordial wilderness to be effective", he wrote. "No men, not even native ones, should live inside its borders. The Serengeti cannot support wild animals and domestic cattle at the same time". Likewise for Huxley, the Masai cattle were "rapidly reducing large stretches of the land to dusty semi-desert".

Pastoral harmony

How wrong there were. It has become increasingly clear that the notion of climax vegetation fails to explain the evolution of Africa's savannahs. "It was not until the mid-1980s", says Dublin, "that we began to see that the natural ecology of African savannahs was much more dynamic, involving massive changes in the space of a decade or two, switching between woodland and grassland". That natural system involved wild animals, cattle and occasional interventions from bush fires. "Pastoralists have herded their cattle in harmony with wildlife for thousands of years", says Robin Reid, systems ecologist at ILRI.

The end result was a shifting mosaic of habitats across the plains. The rinderpest epidemic gave the system a severe kick, pushing it towards bush at the expense of open grassland. By excluding cattle from large areas, colonial ecologists and their successors sought to maintain that state.

Today in much of eastern and southern Africa, there are two ecosystems, created and separated by people: areas where farmers and cattle herders reign and the bush and tsetse are tamed, and areas where the West's peculiar vision of "wild" Africa holds sway, and the bush runs wild and tsetse flourishes. The truth is that the real world before the arrival of colonists was more like the former than the latter.

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