

October 17, 2011

NYTimes

# Chimp to Man to History Books: The Path of AIDS

By DONALD G. McNEIL Jr.

Our story begins sometime close to 1921, somewhere between the Sanaga River in Cameroon and the Congo River in the former Belgian Congo. It involves chimps and monkeys, hunters and butchers, “free women” and prostitutes, syringes and plasma-sellers, evil colonial lawmakers and decent colonial doctors with the best of intentions. And a virus that, against all odds, appears to have made it from one ape in the central African jungle to one Haitian bureaucrat leaving Zaire for home and then to a few dozen men in California gay bars before it was even noticed — about 60 years after its journey began.

Most books about AIDS begin in 1981, when gay American men began dying of a rare [pneumonia](#). In “The Origins of AIDS,” published last week by Cambridge University Press, Dr. Jacques Pépin, an infectious disease specialist at the University of Sherbrooke in Quebec, performs a remarkable feat.

Dr. Pépin sifts the blizzard of scientific papers written about AIDS, adds his own training in epidemiology, his own observations from treating patients in a bush hospital, his studies of the blood of elderly Africans, and years of digging in the archives of the European colonial powers, and works out the most likely path the virus took during the years it left almost no tracks.

Working slowly forward from 1900, he explains how Belgian and French colonial policies led to an incredibly unlikely event: a fragile virus infecting a small minority of chimpanzees slipped into the blood of a handful of hunters, one of whom must have sent it down a chain of “amplifiers” — disease eradication campaigns, red-light districts, a Haitian plasma center and gay sex tourism. Without those amplifiers, the virus would not be what it now is: a grim pilgrim atop a mountain of 62 million victims, living and dead.

In the early 1980s, Dr. Pépin was a young doctor fighting a [sleeping sickness](#) epidemic at a hospital in Nioki, in what was formerly the Belgian Congo, then Zaire, and is now the Democratic Republic of Congo. The virus was then unknown in Africa, but his work gave him clues that would later help him on its trail.

In retrospect, he says in his book, he may have inadvertently infected some of his patients. Ideally, the glass syringes used in Nioki were sterilized in the hospital’s autoclave. But with the electricity often out, nurses boiled them instead. “And I did not pay too much attention to how long they were boiled,” he said in an interview.

Later, he worked in Guinea-Bissau on H.I.V.-2, which is related to H.I.V.-1 but causes a milder and harder-to-transmit form of AIDS that some victims live with for decades. Noting that cases were more common among older people, he concluded that it was dying out. If sexual transmission among young people was not keeping it alive, he

reasoned, some other route must have first made it so widespread among the elderly. He suspected the aggressive campaigns that colonial doctors waged against [syphilis](#), [yaws](#), [leprosy](#), tuberculosis and other ills until independence arrived in the 1960s. They all used injections, since pill versions of many [antibiotics](#) did not exist or were costly.

In 2005, Dr. Pépin began field studies. By sampling the blood of Africans 55 and over, he showed that those who had many injections in their youth or had undergone ritual [circumcision](#), in which many boys were cut with the same blade, often had [antibodies](#) to [hepatitis C](#) or HTLV, a little-known virus that, like H.I.V.-1, comes from chimps and infects the CD4 cells of the immune system, but is harmless.

That was hard evidence that blood and syringes had spread other viruses.

Blood and tissue samples stored in freezers in Africa and in European hospitals that treat Africans — a few going back to the 1950s — form a map of AIDS viral subtypes, which is surprisingly complex. For example, white and black South Africans have different subtypes. “Few homosexual Afrikaners have sex with heterosexual Zulus,” Dr. Pépin notes. The whites’ subtype is common among gay European and American men; the one most common among blacks moved south through Zambia.

Simian immunodeficiency virus, which infects monkeys and apes, is similarly mapped; it was first found in zoo animals, but now is tracked by jungle teams who extract DNA from feces.

The ancestor to AIDS is in one chimpanzee subspecies, Pan troglodytes troglodytes, which in nature lives only between the Sanaga and Congo Rivers. (Chimpanzees can’t swim.) It is a blend of simian viruses from red-capped mangabeys and mustached guenons, small monkeys that chimps hunt and eat.

From colonial archives in Paris, Marseilles, Brussels, Lisbon and London, Dr. Pépin dug out old records of clinics where, as early as 1909, African prostitutes were required to have [venereal disease](#) inspections. He went through stacks of newspapers, like the Voix du Congolais, which wrote extensively about [polygamy](#) and prostitution, and pored over studies by European ethnographers.

(His own fluency in French was crucial, of course.)

In brief, his recounting of the epic journey is this:

In nature, only about 6 percent of troglodytes chimps are ever infected. Within a troop, each female mates with many males, but mating with outsiders is rare, so most troops are untouched while a few are heavily infected.

H.I.V.-1’s four genetic groups, M, N, O and P, show that it made the chimp-human jump at least four times in history. But group M accounts for more than 99 percent of all cases.

Why did only one spread?

Molecular clock dating shows that M reached humans somewhere near 1921. Chimpanzees are too big and agile to be hunted with anything but guns, which until the 20th century were almost entirely in white hands.

Using colonial census data, surveys of how modern bush-meat hunters butcher kills, and infection rates among nurses stuck by dirty needles, Dr. Pépin calculates that, in the early 1920s, a maximum of 1,350 hunters might have had blood-to-blood contact with troglodytes chimps. Only 6 percent of the chimps — about 80 — would have been infected, and fewer than 4 percent of the scratched hunters probably could have caught it. That would suggest only three infected hunters at most.

Given how inefficient most sexual spread is — in some cases, a husband and wife can have sex for months without passing H.I.V. — sex alone would not have let three hunters, or even a dozen, pass on their virus to today's millions, he argues. There must have been an amplifier.

Studies among heroin addicts — he cites examples from Italy, New York, Edinburgh and Bangkok — show that blood transmission is 10 times as efficient.

In the 1920s, machine-made glass syringes replaced expensive hand-blown ones, and the Belgians and French attacked many diseases in their colonies, both out of paternalism and to create herd [immunity](#) to protect whites. Patients might get up to 300 shots in a lifetime. Other diseases have spread this way; an Egyptian campaign against [schistosomiasis](#) ended in 1980 after giving more than half its “beneficiaries” [hepatitis C](#).

Thus, one hunter's group M infection could have become dozens. Then Dr. Pépin's focus shifts to the twin cities facing each other across the Congo: Leopoldville (now Kinshasa) on the Belgian side, Brazzaville on the French.

They are the epidemic's cradle; viral diversity is highest there, and the earliest positive blood sample, from 1959, was found there.

From 1900, both grew from tiny river outposts into cities, but only black men with colonial work permits were allowed to live in them legally. Naturally, women followed. But until 1960, brothels were rare. Most of the women were “femmes libres” — escapees from rural polygamy who typically had only three or four clients for whom they also cooked and did laundry.

Colonial authorities tolerated and taxed this. At one point, the “unmarried woman tax” was 20 percent of the budget of Stanleyville.

Since femmes libres had few partners, viral spread was probably sluggish, although occasional hepatitis outbreaks were noted at clinics where prostitutes got penicillin shots for syphilis — suggesting amplification by needle there, too.

In the 1960s, everything changed. World War II had swollen the twin cities, which supplied raw materials the Allies lost when Japan conquered Asian colonies. Then, when whites fled the chaos of independence, economies collapsed. Poverty was rampant.

Dozens of bar-brothels called “flamingoes” sprang up, competition forced desperate women to have sex with up to 1,000 clients a year, and venereal disease treatment dried up. There must have been a viral explosion like the one that happened 20 years later in a closely studied band of prostitutes in Nairobi: In 1981, 5 percent of them had the virus; three years later, 82 percent did.

The next link was Haiti. Because white Belgians never trained an African elite, only about 30 Congolese outside the priesthood had university degrees at independence.

To fill the gap, the United Nations hired bureaucrats and teachers from abroad. About 4,500 Haitians answered the call; they were black, well educated, French-speaking and eager to earn more than they could at home.

Now Dr. P epin’s calculations get slightly more speculative.

Group M of H.I.V.-1 is, in turn, broken into subgroups A through K.

Haiti’s epidemic, like that of North America and Western Europe, is nearly all subgroup B. But subgroup B is so rare in central Africa that it causes less than 1 percent of cases.

That suggests AIDS crossed the Atlantic in just one Haitian. Molecular clock dating indicates it reached Haiti roughly in 1966.

Once again, Dr. P epin argues that rapid expansion through sex alone is mathematically impossible and that there must have been an amplifier. He believes the culprit was a Port-au-Prince plasma center called Hemo-Caribbean that operated only from 1971 to 1972 and was known to have low hygiene standards.

Plasma centers take blood, spin it and return the red cells. If new tubing isn’t used for each patient, infections spread. Sloppy plasma operations caused later H.I.V. outbreaks in Mexico, Spain and India and, most famously, in rural China, where 250,000 sellers were infected.

Hemo-Caribbean’s co-owner was Luckner Cambronne, leader of the feared Tontons Macoutes secret police. Nicknamed the “Vampire of the Caribbean,” Mr. Cambronne, who died in 2006, bled 6,000 sellers who were paid as

little as \$3 a day and exported 1,600 gallons of plasma to the United States each month, according to [an article in The New York Times](#).

Haiti was also a prime destination for gay American sex tourists; the Spartacus travel guides described how much young men expected to be paid. By the early 1980s, subgroup B was killing both American homosexuals and [hemophiliacs](#), suggesting it arrived via both routes. The modern history of AIDS had begun.

Along the way, Dr. Pépin debunks other origin myths.

The most grotesque was what he called the “surgical [Viagra](#)” fad of the 1920s. About 2,000 American and European men — mostly rich, old and impotent — had chimpanzees’ testicles implanted in their scrota. The fad died after the word of [tissue rejection](#) spread, and after a few women had chimp ovary implants, which scandalized editorial writers who suggested they would give birth to ape-human hybrids.

A better-known myth stems from a 1999 book called “The River,” which argued that the virus was in an experimental polio vaccine said to have been grown in chimpanzee cells.

Last year, when his publisher sent Dr. Pépin’s draft manuscript to Dr. Max Essex, chairman of the AIDS Initiative at the Harvard School of Public Health, Dr. Essex was “biased against the idea,” he said in an interview, because he was still upset at what he considered the “distorted nonsense” of the [polio](#) hypothesis.

“But I was unexpectedly surprised,” Dr. Essex said. “This is very scientifically hard, objective scholarship.”

Dr. Allan Ronald, a University of Manitoba AIDS expert who began the Nairobi prostitute study, also read an early version and called Dr. Pépin “one of the unsung heroes of AIDS research.”

While others had speculated that syringes amplified the virus, he said, “Jacques did the studies among elderly people that were needed.”

Dr. Pépin also found tantalizing evidence of what might have been early AIDS outbreaks.

Dr. Léon Pales, a French military doctor, investigated soaring death rates among men building the Congo-Ocean Railway in the 1930s. In 26 autopsies, he found a [wasting](#) condition he called “Mayombe cachexia,” after the stretch of jungle where the men died; the men had atrophied brains, swollen bowel lymph nodes and other telltale AIDS symptoms.

And, in one of his own studies of elderly Africans, Dr. Pépin was told that many of those injected against sleeping sickness in the 1940s had died in the 1950s. Since many of the survivors were infected with HTLV, another chimp virus, he surmised that their long-dead friends might have been among the first victims of AIDS.

