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Jungle Fever

Did two U.S. scientists start a genocidal epidemic in the Amazon, or was The New Yorker duped?

BY JOHN TOOBY

OCT 25, 2000 • 3:00 AM

To read a reponse to this article from the editors of The New Yorker*, click here.*

Lately I've been engrossed in—and in some sense involved in—the most sensational scandal to emerge from academia in decades. The scandal erupted last month when two anthropologists, Terry Turner and Leslie Sponsel, sent a searing letter to the president of the American Anthropological Association. The letter distilled a series of chilling "revelations" made by the journalist Patrick Tierney in his forthcoming book *Darkness in El Dorado: How Scientists and Journalists Devastated the Amazon*. According to Turner and Sponsel, the scandal unearthed by Tierney, "in its scale, ramifications, and sheer criminality and corruption," is "unparalleled in the history of Anthropology." Turner and Sponsel listed a horrifying series of crimes—"beyond the imagining of even a Josef Conrad (though not, perhaps, a Josef Mengele)"—including genocide, allegedly committed by U.S. scientists against the Yanomamö, an indigenous people living in the Venezuelan and Brazilian rain forest.

Turner and Sponsel's letter spread like a virus over the Internet, quickly driving the controversy into the mainstream press. A story in Britain's *Guardian*—"Scientist 'killed Amazon indians to test race theory' "—was followed by accounts in *Time* and the *New York Times*, on NPR's *All Things Considered*, and so on. The accusations drew strength from two institutions that endorsed Tierney's credibility: *TheNew Yorker*, known for its obsessive fact-checking, published an adapted excerpt from the book early this month; and the fact that the book is scheduled for publication next month by W.W. Norton, which is highly respected by academics.

Pre-publication galleys of the book show why it inspired such trust. Tierney's argument is massively documented, based on hundreds of interviews, academic articles, and items uncovered under the Freedom of Information Act, not to mention his own visits among the

Yanomamö. Through 10 years of dogged sleuthing, it would seem, Tierney dragged a conspiracy of military, medical, and anthropological wrongdoing into the light. Last week, when finalists for this year's National Book Awards were announced, *Darkness in El Dorado* was listed in the nonfiction category.

There is only one problem: The book should have been in the fiction category. When examined against its own cited sources, the book is demonstrably, sometimes hilariously, false on scores of points that are central to its most sensational allegations. After looking into those sources, I found myself seriously wondering whether Tierney had perpetrated a hoax on the publishing world. Of course, only he knows whether he consciously set out "to trick into believing or accepting as genuine something that is false and often preposterous"—the dictionary definition of a hoax. But the book does seem systematically organized to do exactly that. And, to a frightening extent, it has succeeded.

The accusations are directed primarily against James Neel, a physician and a founder of modern medical genetics (now dead), and Napoleon Chagnon, perhaps the world's most famous living social anthropologist. Tierney describes Neel as an unapologetic "eugenicist" who believed as a "social gospel" that "democracy, with its free breeding for the masses and its sentimental supports for the weak" is a eugenic mistake.

Tierney argues that, starting in the 1960s, Neel and his researchers were funded by the Atomic Energy Commission to conduct horrifying medical "experiments" on the Yanomamö. Far and away the most serious allegation is that the researchers killed hundreds or even thousands by knowingly releasing a contagious measles virus into the previously unexposed Yanomamö population. As Turner and Sponsel put it, "Tierney's well-documented account … strongly supports the conclusion that the epidemic was in all probability deliberately caused as an experiment designed to produce scientific support for Neel's eugenic theory." Chagnon—described by Tierney as a "disciple" of Neel's—was implicated in this crime and charged with inadvertently bringing other devastating diseases as well. What's more, Chagnon was said to have been the main cause of the violence he saw among the Yanomamö and more generally to have twisted his scholarly portrayal of them to bolster his Hobbesian theories of human nature.

I was an early recipient of this ethics complaint, in that small number of Internet nanoseconds when it was still considered confidential. As president of the Human Behavior and Evolution Society, of which Chagnon was a prominent member, I was obliged to investigate the allegations, just as the American Anthropological Association would be doing. Chagnon had been my departmental colleague since I moved to the University of California, Santa Barbara, a decade ago, and I consider him a friend. (Click for full

disclosure.) But I'd never met Neel, and for all I knew, he really was a eugenics crackpot, exploiting the isolation of his field site in some warped way. And as for Chagnon—well, how much do we really know about the person in the next office?

Starting with the most serious charge—genocide—I looked up what Neel himself wrote about the measles epidemic. Tierney alleged that a measles vaccine Neel's team administered to the Yanomamö, Edmonston B, was a dangerous agent—and was known to be so at the time—and triggered the epidemic. In Neel's (a cover-up?), what Tierney finds suspicious—that a measles outbreak started around the time Neel first administered the vaccine—has a different explanation: After Neel learned about the incipient outbreak, he started vaccinating people, trying furiously to head off an epidemic.

To my nonspecialist ears, Tierney's theory sounded possible: Many vaccines, including measles vaccines (then and now), use attenuated live virus, which, when injected, gives the recipient an infection that is supposed to stimulate the immune system. So why couldn't a live virus have spread contagiously from Yanomamö to Yanomamö, launching a deadly epidemic?

I started putting in calls to the Centers for Disease Control and Prevention in Atlanta. Conversations with various researchers, including eventually Dr. Mark Papania, chief of the U.S. measles eradication program, rapidly discredited every essential element of the Tierney disease scenarios.

For example, it turns out that researchers who test vaccines for safety have never been able to document, in hundreds of millions of uses, a single case of a live-virus measles vaccine leading to contagious transmission from one human to another—this despite their strenuous efforts to detect such a thing. If attenuated live virus does not jump from person to person, it cannot cause an epidemic. Nor can it be *planned* to cause an epidemic, as alleged in this case, if it never has caused one before.

Experts elsewhere have confirmed this—and have confirmed the safety of the Edmonston B vaccine under the conditions in which it was used. (Click here for a statement from the University of Michigan on this point and other errors in Tierney's book; here for statements by Dr. Samuel L. Katz, a co-developer of the Edmonston B vaccine, on studies of the vaccine's safety, including in tropical populations; and here for an account by Susan Lindee, an historian of science at the University of Pennsylvania, on what she found from reading Neel's field notes.) All told, the evidence against Tierney's genocide thesis is now so overwhelming that even Turner, its once-enthusiastic supporter, has backed off. He

concedes that the medical expert he finally got around to consulting took Tierney's medical claims and "refuted them point by point."

You'd think the Tierney book, 10 years in the making, might mention the relevant and easily discoverable fact that, as the Michigan medical report puts it, "live attenuated vaccine has never been shown to be transmissible from a recipient to a subsequent contact." Somehow it omits it (even though this information is featured prominently in a paper Tierney cites five times!). The *New Yorker* piece also fails to mention it and instead says, "Today, scientists still do not know whether people who have been vaccinated with Edmonston B can transmit measles." This is literally true, but only because scientists use the word *know* very carefully. Scientists also do not *know* that *The New Yorker* is not riddled with a cult of pedophilic Satan worshipers or that the Pentagon is not in the control of extraterrestrials masquerading as generals. If you ask a *good* scientist about each of these allegations, she would be forced to answer, yes, it's possible. But she will consider it relevant and worth mentioning, as *The New Yorker* does not, that the failure to substantiate a hypothesis given millions of opportunities floats the hypothesis out toward the scientific neighborhood inhabited by ESP and UFOs.

Once I had seen Tierney's most attention-getting claim crumble, I started through the galleys of his book systematically, evaluating it against available sources with the help of various colleagues. Almost anywhere we scratched the surface, a massive tangle of fun-house falsity would erupt through.

We had to accept from the outset that scores of conversations reported in the book are with people scattered through the rain forest, virtually impossible to contact (even for *The New Yorker*'s energetic fact-checkers). So Tierney's veracity would have to be judged on the basis of sources that could be reached. I had already run into one such source—Papania of the CDC, whom Tierney had interviewed for the book. Papania told me that he was troubled to find, in galleys he'd recently been sent, that Tierney had misquoted him. Tierney had him endorsing the idea that the vaccine was a plausible cause of the epidemic, which was not, in fact, his view.

It soon became evident that Tierney was no more faithful to written sources than to oral ones. To begin with, comparing Neel's autobiography with Tierney's use of it is an education in audacity. Whatever Tierney might have wished to convey by calling Neel a "conservative" and claiming that "Neel's politics were too extreme for Reagan's council on aging," Neel's book shows him to be a supporter of Al Gore ("superb," "the most hopeful recent sign"), a Reagan-Bush basher ("chilling," "myopic"), pro-nuclear-disarmament, and an enthusiastic environmentalist. Neel's conflict with the advisory council on aging, it turns out, came when

he objected to the diversion of money from poor children into research on how to artificially extend the human life span—research that, Neel speculated, would wind up benefiting mainly the affluent.

And what of Tierney's claim that Neel was a "eugenicist" who believed as a "social gospel" that "democracy, with its free breeding for the masses and its sentimental supports for the weak" was a eugenic mistake? It turns out that Neel had been a fierce opponent of eugenics for 60 years, since his student days. To dramatize his opposition, he labeled his beliefs *euphenics*, emphasizing the medical and social importance of environmental interventions. As Neel put it, the "challenge of euphenics is to ensure that each individual maximizes his genetic potentialities" through the creation of environments in which each can flourish, and "to ameliorate the expression of all our varied genotypes"—ameliorate the *expression* of our genes, not the genes themselves. Neel lists, as examples of good social investments, prenatal care, medical care for children and adolescents, good and equal education for all children, and so on.

There is not a word on any of the pages Tierney cites about how "democracy … violates natural selection." Indeed, though worried about overpopulation, Neel argues that there is no scientific or moral basis for preventing anyone from being a parent, and he says that guaranteeing the equal right to reproduce would "preserve insofar as it's possible all of [our species'] poorly understood diversity." Neel even does an extended calculation to debunk the eugenicist fear that reproduction by those with genetic defects threatens the gene pool!

Neel does analyze, in the standard way population geneticists do, how unfavorable genetic mutations were "selected out" more rapidly before the invention of agriculture and subsequent creature comforts, and before the transition from polygamy to monogamy (which slows the form of natural selection known as "sexual selection"). Here, as elsewhere in the book, Tierney works feverishly to erase the simple distinction—basic to all scientific discussion—between describing something and endorsing it. In this case, it was a difficult erasure, since Neel, far from wanting to return humanity to a lost world where natural selection is more intense, had called this "unthinkable." (Incidentally, if you're wondering why Neel might have found a measles epidemic useful as a test of his, as Tierney claims, the answer is that Tierney never provides a coherent explanation.)

This pattern of falsification—of which I have mentioned only a small sampling—extends to Tierney's assault on Napoleon Chagnon. To begin with, Tierney—like some other Chagnon critics—caricatures Chagnon's view of human nature, as if Chagnon considered people innately violent, period. In reality, Chagnon, pondering the relative rate that "people,

throughout history, have based their political relationships with other groups on predatory versus religious or altruistic strategies," concludes that "we have the evolved capacity to adopt either strategy," depending on what our culture rewards.

Still, there's no doubt that Chagnon has a more Hobbesian view of human nature than is popular in most anthropological circles. Tierney claims that Chagnon, to support this view, exaggerates Yanomamö violence. He doesn't mention the fact that the rates of violence Chagnon documents are not high compared with the rates found by anthropologists in other pre-state societies. Nor does he mention Chagnon's view that, if anything, the Yanomamö's rate of lethal violence is "much *lower* than that reported for other tribal groups."

Not only does Tierney generally ignore inconvenient data, citing only anthropologists who disagree with Chagnon. He also, time and again, has a way of magically turning anthropologists whose data support Chagnon into anthropologists who contradict him. For example, Tierney cites a study of the Jivaro by Elsa Redmond that he claims undermines one of Chagnon's Yanomamö findings: that the effective use of violence contributes to social status, the acquisition of multiple wives, and the having of many offspring.

Here is Tierney's summary of Redmond:

> Among the Jivaro, head-hunting was a ritual obligation of all males and a required male initiation for teenagers. ... Among the Jivaro leaders, however, those who captured the most heads had the fewest wives, and those who had the most wives captured the fewest heads.

Here is what Redmond actually says:

> Yanomamo men who have killed tend to have more wives, which they have acquired either by abducting them from raiding villages, or by the usual marriage alliances in which they are considered more attractive as mates. The same is true of Jivaro war leaders, who might have four to six wives; as a matter of fact, a great war leader on the Upano River in the 1930s by the name of Tuki of José Grande had eleven wives. Distinguished warriors also have more offspring, due mainly to their greater marital success.

Similarly, Tierney cites anthropologist John Peters at various points in his argument that Chagnon exaggerates Yanomamö violence. But what Peters actually writes in his book *Life Among the Yanomamo* is far stronger than anything Chagnon has written: "Anyone who is even minimally acquainted with the Yanomami is familiar with the central role of war in this culture. Violence seems always just a breath away in all Yanomami relations."

Throughout the book, Tierney is comically self-aggrandizing, often presenting as his own discoveries things plainly described in Chagnon's publications. After complaining that Chagnon concealed the identity of villages from which some of his more controversial data were drawn, Tierney writes, "It took me quite a while to penetrate Chagnon's data, but, by combining visits to the villages in the field with GPS locations and mortality statistics, I can identify nine of the twelve villages where all the murderers come from in his *Science* article." Or, if he didn't want to do all that walking and calculating, he could have gotten this information by consulting sources listed in his own bibliography, such as a 1990 Chagnon article and Chagnon's *Yanomamo Interactive* CD.

Although Tierney's many misrepresentations are riveting, his omissions are equally important—and harder for fact-checkers to spot, since omissions don't have footnotes. They figure centrally in two of Tierney's core accusations: that Chagnon inadvertently introduced various diseases besides measles into the region just by going there; and that Chagnon, by giving pots, machetes, and other steel tools to the Yanomamö, somehow exacerbated the rate of warfare, thus influencing the very data he gathered.

Both of these claims are logically possible. But Tierney fails to mention some relevant facts (well known to him) that call them into question.

Tierney presents the Yanomamö as if they were isolated in a petri dish, except when Chagnon visited and sneezed. In reality, the Yanomamö are tens of thousands of people, surrounded by other people with real diseases who have regular transactions with them. Moreover, this 70,000-square-mile area is penetrated by thousands of non-Yanomamö: missionaries, gold miners (over 40,000), highway workers, government officials, tin miners, loggers, ranchers, rubber tappers, drug smugglers, soldiers, moralists like Tierney, and on and on. This whole area is beset by epidemics of various kinds, as the Yanomamö tragically encounter diseases from the industrialized world. So, the probability that Chagnon or Neel or Tierney in particular is the source of any specific epidemic is, crudely speaking, one divided by these tens of thousands. Yet Tierney strangely insists that disease, like war, somehow specifically dogs Chagnon's movements.

To reliably identify the major sources of disease, one would need to collect demographic data in many villages and map it against the various forms of contact. As it happens, this is just what Chagnon did, and he gradually concluded that the Catholic missions were serious sources of disease, largely because of their regular roles as points of contact and entry. Yanomamö living at the missions benefited from the medical care, but those living close enough to catch their diseases yet too far to get the medical care suffered. When Chagnon saw the pattern, he blew the whistle. This did not endear him to the missionaries, who have

ever since been the source of enough anti-Chagnon anecdotes to keep an enterprising journalist busy for years.

Similarly, Tierney says that competition over the pots and machetes and other steel tools that Chagnon gave the Yanomamö sometimes led to war. This too is logically possible. The Yanomamö certainly valued Chagnon's gifts, since cutting the jungle back for their crops was much easier with machetes. But Tierney fails to mention that Chagnon's contributions (made so that he would be allowed to collect data) were dwarfed by all the other sources of such items, such as the military, who hired Yanomamö laborers, and especially the vast mission system, which imports boatloads of machetes and other goods, and even has its own airline.

While Tierney considers Chagnon's distribution of steel tools an outrageous threat to peace, he amazingly gives a free pass to the introduction by others—including some missionaries—of hundreds of shotguns. These weapons are known to have been used by the Yanomamö in raiding from mission areas to the less well-armed villages where Chagnon worked. Chagnon blew the whistle on this, too.

In short, what Tierney leaves out of his story is that what his key sources have accused Chagnon of—causing disease and warfare—just happens to be what Chagnon had previously accused some of them of doing. Indeed, a prerequisite of Tierney's ability to do research in this restricted area was almost certainly his endorsement of one side in this feud. Tierney's translators, his guides, his selection of interviewees—all carry the strong implication that he received a guided tour drenched with these local politics. Throughout the book, Tierney goes to extraordinary lengths to explain away real causes of disease and violence that trace back to his patrons. (He has a whole appendix devoted to attacking evidence that the missionaries spread disease.) When this context is supplied, the unremitting denunciations of Chagnon start to sound different, and Tierney, *The New Yorker*'s intrepid "Reporter At Large," appears in a less flattering light.

Chagnon has made enemies in academia as well as in the rain forest. Anthropology is full of people who still subscribe to Rousseau's "noble savage" view of human nature, and their battles with Chagnon have been intense. That is why Tierney could pepper his *New Yorker* article, and his book, with anthropologists who question Chagnon's Yanomamö data—a technique of great rhetorical power unless you know about all the anthropologists Tierney doesn't mention whose data support Chagnon. Chagnon's longtime critics include Turner and Sponsel, a fact that explains their uncritical and hyperbolic embrace of the Tierney book, and a fact that isn't mentioned in their incendiary letter to the American Anthropological Association.

With experts increasingly coming forward to debunk various aspects of the Tierney book, the accusations against Neel and Chagnon "are crumbling by the hour," as it was put by Lou Marano of UPI, one of the few reporters to deeply examine the credibility of Tierney's charges. But much damage has already been done—and not just to the reputations of Neel and Chagnon. Tierney's claim that an immunization program can start an epidemic has been carried around the world in media reports. This myth could compromise the ability of health workers to administer such programs, especially in poor countries, and people could die as a result. Moreover, indigenous cultures will not benefit from the public's impression that they are endangered only by the occasional anthropologist, when in fact they are victims of far

more powerful forces, ranging from well-meaning missionaries to untrammeled modernization.

The slow-motion tragedy of the world's indigenous peoples continues, and Tierney's thoroughly dishonest book is just one more exploitation of them.
