

24–29; Barker 1961; Eguillor García 1984:133–35; Lizot 1977; Chagnon 1988), and revenge is the most important cause of that warfare. Tierney ignores this critical information.

In numerous places Tierney claims that Chagnon has exaggerated Yanomamö violence. He is not alone in this accusation. It has been made by other Yanomamö field researchers, including Lizot (1994), Albert (1989), and Good (Good and Chanof 1991). It is unclear whether they are saying that Chagnon overgeneralizes, warfare being intense only where he did his research, or that warfare is less important than he believes in his own area of study. It is therefore important to examine what these ethnographers say about warfare in their own research areas.

Lizot's charge is belied by his own statements. In the narration for *Warriors of the Amazon*, a film shot in his long-time research village for which he was the ethnographic consultant, we find the following: "The necessity of these lessons is reinforced by the threat of warfare that overshadows their lives. Although men may only go off to fight two or three times a year, they live in a state of vigilance" (<http://www.pbs.org/wgbh/nova/transcripts/2309warr.html>). In a recent letter to the Venezuelan newspaper *El Nacional* (<http://www.el-nacional.com/eln17112000/f-pc4s1.htm>: 17 November 2000), Lizot condemns Tierney's book and defends Chagnon against charges of starting a measles epidemic and causing war with trade goods. Here he says that warfare is a constitutive trait of Yanomamö social and political organization. In the same letter he repeats his charge that Chagnon tends to exaggerate Yanomamö violence, but it is difficult to square this charge with his own statements about the fundamental pervasiveness of warfare in their daily lives (see also Lizot 1984: esp. 36–37). Catherine Ales, a French colleague of Lizot who has been working on and off with the Yanomamö for nearly three decades in the more peaceful Parima region, echoes Lizot's statement on Yanomamö warfare: "In Yanomami society, the system of aggression is a constitutive element of their social organization" (1984:110, my translation). This comes near the end of an article

in which she details habitual forms of Yanomamö aggression from shouting matches to duels to raiding and concludes that duels, sorcery, and war are ways of defending private and collective rights (see also Ales 1990: 92).

Finally, Peter's recently published ethnography on the Yanomamö has a chapter on warfare which begins with the following sentence: "Anyone who is even minimally acquainted with the Yanomami is familiar with the central role of war in this culture" (2000:207). The last two sentences of the chapter read: "Humans are killed almost as easily as monkeys in the forest. There is no shame, no guilt, and little conscience in the killing, although there will be a fear that the murder might be avenged by raid or sorcery in future" (2000:220). From three different ethnographers we have summary statements that warfare is either central to or constitutive of Yanomamö social organization. Again, Tierney ignores these sources.

One way to determine if Chagnon has exaggerated Yanomamö warfare is to look at the adult male mortality from warfare (fraction of all males older than 16 who die from war) documented in different areas of the Yanomamö distribution by other ethnographers. A few years ago Bruce Albert, a major critic of Chagnon, provided such data in this journal (1989). I have modified his table (1989:637, table 1) by adding two new sources (table 1). Mortality from warfare is clearly higher in the Shamataari area than in any other, but another of Chagnon's groups, the Namowei-teri, has a mortality rate very similar to those of groups studied by Peters and Lizot. Perhaps one can argue, as does Tierney, that Chagnon "cooks" his data to make warfare appear more intense. In that regard, Lizot's observations about the accuracy of Chagnon's data are worth considering. In n. 9 of an article (1994) critical of Chagnon's work he says of his mortality statistics: "Chagnon's figures seem to me to be close to reality." He goes on to note that the Yanomamö he and Chagnon studied were unacculturated and more warlike than the acculturated Yanomamö studied by others such as Albert. He is able to make such an assessment because his area of study slightly overlaps with Chagnon's, he has visited many of the villages Chagnon studied, and they have had informants in common.

The reviews here and elsewhere will surely be followed by journal articles, professional symposia, edited volumes, and perhaps even monographs devoted to an evaluation of Tierney's fantastic and reckless claims. Over the long term I am confident that the discipline and the individuals harmed will recover. What worries and saddens me is the enormous short-term damage that this will inflict on native peoples.

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TABLE 1

*Adult Male Mortality from Warfare among Yanomamö*

Group	Ethnographer	Adult Male Mortality (%)	Source
Shamataari	Chagnon	40	Albert (1989)
Shamataari and Namowei-teri	Chagnon	38	Melancon (1982: 33–34)
Mucajai	Early and Peters	27	Early and Peters (2000:129) <sup>a</sup>
Namowei	Chagnon	24	Albert (1989)
Haiyamo	Hames	12	Albert (1989)
Central	Lizot	10–24	Albert (1989)
Catrimani	Albert	14	Albert (1989)

<sup>a</sup>My estimate.

More than once as the controversy over this book unfolded reporters and others told me the number of foot-

notes in Tierney's chapter on the measles outbreak: 147. I have now tallied the total number of footnotes in the entire book including the appendix (1,599). Such numbers seem to interest people. It is considerably more difficult to quantify the evidentiary force and legitimacy of these footnotes. My own assessment is perhaps suggested by the fact that I have rewritten this review several times in an effort to make it difficult for anyone to extract a decontextualized endorsement on some future web page or book jacket. This accounts for the somewhat stilted style, for which I apologize.

On its own terms, the book is well within a traditional journalistic genre, the exposé of injustice, with a strong emphasis on making the victims visible and empathetic by giving them names and identities and perspectives and voices. Eileen Welsome's (1999) *Plutonium Files* is a somewhat comparable study of a different group of human subjects, those involved in AEC radiation tests. Tierney's engagement with the Yanomami, which reflects this journalistic formula, is the most respectable aspect of his work. His Yanomami speakers have intense and visible agency, and while I never fully trust the storyteller the stories are nonetheless compelling, even riveting. There is the emergence of the strange young leader Cesar Dimanawa and the remarkable life of Helena Valero, who was kidnapped at 12 by a Yanomami group and became Yanomami. There is Yarima, who married the anthropologist Kenneth Good but could not live in New Jersey and left her children there to return to the forest. There is the image of Yanomami filmmakers producing their own documentary about the activities of a *National Geographic* film crew. To his credit, Tierney does not construct the Yanomami as silent or unable to speak for themselves.

In Tierney's further defense, Napoleon Chagnon seems to have provided ample testimony to his many enemies, and Tierney draws some of his most damaging quotes from Chagnon's own published work. I am not sure what Chagnon was practicing, but I do not think it was the sort of thing students should be encouraged to emulate, and I consider it extremely unfortunate that his work has been so widely and so uncritically distributed to students in the United States as a model of anthropological research.

Tierney's credibility problems, however, make reading every sentence in this book an exercise in hermeneutics. There was a moment in the text, on the second or third reading, when I began to feel that I was developing some expertise, some fluency, in Tierney's style. It was when he began to discuss a section of the 1968 tape recording in which, he writes, "a [Yanomami] man muttered a sentence including the word horemu, meaning 'lying' or 'faking'" (p. 105). I felt fluent when I could see, immediately, the sentence's porous structure and instability. Tierney's wording is characteristically vague ("a man"?), and the quote about "horemu" is followed immediately by a disclaimer saying that the tapes "still await competent translation." Was Tierney's translation incompetent? And didn't Tierney's wording leave open the possibility that the muttered "sentence including the word

horemu" was in fact something like "we are not lying" or "faking would be wrong" or something equally innocuous, irrelevant, or difficult to interpret? When I read this passage and could see its porosity, I began to be confident of Tierney's fixed grounds of reference and of his self-subversion.

That self-subversion takes the form of apostasy. Tierney is a disappointed adventurer, denouncing the masculine seductions that once enthralled him and also drawing on them at every turn, invoking personal risk as central to authenticity, foregrounding his research acumen, and mirroring the epistemological frames of his primary actors. The resulting text is incoherent, keeping the reader always slightly uncomfortable with content, evidence, and narrative track.

Tierney for example expresses high confidence in Yanomami reports of numbers of deaths in one chapter (most of his data on measles and other disease deaths come from Yanomami reports) and in another states that Yanomami reports of deaths from warfare cannot be taken as true because the Yanomami do not count higher than two and, in another discussion, because they do not necessarily distinguish between physical death and spirit death. He castigates the behavior of Napoleon Chagnon and Timothy Asch and then says that he himself would have behaved even more inappropriately in the same situation. He constructs science as an evil knowledge system linked to nuclear weapons and corporate capital and prepares his own technical charts from data in the *New England Journal of Medicine* or from his own field research into "Filming Deaths" (p. 121). He chooses to locate himself in the terrain of courageously excavated pure fact and then neglects to worry too much about accuracy. He also picks up threads from different people and different institutions and amalgamates them for the purposes of the narrative stream. Thus his James V. Neel seems to be a composite character, with the basic persona of a generic evil scientist (see any recent disaster movie) combined with aspects of the fly geneticist H. J. Muller, the mouse geneticist William Russell, and occasionally even Neel himself. And Tierney's Atomic Bomb Casualty Commission seems to be a cross between Douglas MacArthur, the AEC, and the Manhattan Project instead of the tenuous and insecure institution it was until 1974. Some of Tierney's details are correct, but they apply to different people, different institutions, different issues, different periods. This is disorienting when one knows the subject and opaque when one does not.

The text twists and turns, bringing up details that are not quite relevant, evoking paranoid vistas, jumping between unrelated events in ways that suggest conspiracies, and oscillating between technocratic rationality and emotive experience and between rage and love. And all this, I suspect, provides the narrative tension. Reading it is like watching someone self-destruct for a good cause. Tierney is a flaming Buddhist monk. One cannot quite turn away.

From my examination of the evidence presented in relation to the 1968 measles epidemic, I assume that only about one-sixth of what Tierney reports has any general

basis in what might be understood to be actual events. Yet even diluted to one-sixth strength, it is a terrifying story of unintended consequences, ignorance, cruelty, and self-deception by anthropologists and other scientists, physicians, government officials, missionaries, and journalists. The story and characters are astonishing, and they grow larger and more astonishing in every chapter until they are literally all bound together in an evil global conspiracy (p. 310).

When I began to read Neel's field notes about his work with the Yanomami in Venezuela in early 1968, I lingered over the names of those vaccinated and the names of the small villages in which they lived. At Coshiwora-tedi, Boshidoma had a bad rash from the 8th to the 16th of February, but Cajicumwa had only a slight headache after the vaccination. At Bisaasi-tedi, the infant Coima ijiyu was not vaccinated because he was too small and young. I wondered if for them, for Boshidoma or Cajicumwa, being vaccinated was desirable or terrible. I wondered if they would have chosen the vaccine or chosen to take their chances with the measles that was making its way down the Orinoco River. I wondered how it felt to interact with the American geneticist and his teams. I wondered, too, if Neel might have sought the resources and the personnel to make possible a comprehensive and well-coordinated vaccination program instead of a haphazard stopgap program as an add-on to a project focused on other, more important things like blood and data collection.

I wish very much that someone else had written Tierney's book. I wish someone had written it who could have both told the story in a way that would attract attention (this Tierney has been able to do) and also been careful about records and claims and done justice to the labyrinthine world of the Yanomami. Tierney's handling of the measles epidemic is inexcusable and irresponsible, and his portraits of his primary actors are deeply flawed. His 1,599 footnotes are little more than textual display. Yet even with all its manifest weaknesses, the book has opened a public debate. Its unstable narrative has provoked many of us to look at ethnographic and genetic practices with disturbing, if not novel, questions.

The Yanomami have been asked to participate in many different stories over the years. They have been asked to be Stone Age people who could reveal how human evolution occurred and therefore how society should be organized. They have been asked to be the seductive messengers of the potential of liberal humanism. They have also been asked to demonstrate the terrible impact of industrialized steel goods and technocratic rationality. Yet who should bear the burden of such chaotic industrialized longings?

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The dust jacket of *Darkness in El Dorado* reflects the hyperbolic tone of the whole book. On the front cover,

a subtitle promises to show how scientists and journalists devastated the Amazon; government-sponsored swarms of road builders, tens of thousands of gold miners, national and foreign lumber companies, and state and private agribusiness megaprojects apparently do not count. On the back cover, one finds an equally puzzling characterization of the book by the anthropologist Leslie Sponsel: "in many respects, the most important book ever written about the Yanomami." This sentence may have been taken out of context for publicity reasons but must strike the reader as odd when applied to a book of uncertain importance that is *not* about the Yanomami. Other bombastic statements permeate the text, such as proclaiming Chagnon "the best-known American anthropologist since Margaret Mead" (p. 8) and attributing to him the power to "cast a spell on the whole world of anthropology" (p. 313). Stylistic excesses notwithstanding, very serious issues are raised even when the author stretches his journalistic imagination to its limits.

A particularly disturbing aspect of the book is the incoherence that was introduced when the author made significant changes in the galley proofs. These proofs had been widely circulated and became the object of an extraordinary electronic panic in the academic world. The late and extensive revisions have made a confusing and sometimes contradictory tangle of what was a key element in the galleys, the forceful denunciation of a pattern of unethical behavior towards the Yanomami of Venezuela by the geneticist James Neel's research team in the late 1960s. The revised text that was published retains part of this denunciation while simultaneously undercutting it and fails to address the resulting inconsistency. Chapter 5, the main locus of the author's accusations, originally closed with hints of cover-up operations with the disappearance, "like the ashes of the Yanomami dead," of important film footage. Now it ends by giving Neel the benefit of the doubt: "At times, Neel genuinely wanted to help the Yanomami and sincerely thought he was doing so" (p. 82). Whereas in the galleys Neel emerged as an aggressive scientist intent on carrying on his atomic-genetic experiments at all costs, in the published version Neel and his assistants are reduced to a bunch of bewildered men at a loss amidst a ravaging measles epidemic. Anyone who has ever experienced the pandemonium of a generalized epidemic consuming 80 to 90% of an indigenous community can appreciate their overwhelming sense of urgency and disorientation (Ramos 1995). Tierney insists that Neel used the wrong measles vaccine and more than insinuates that, instead of protecting the Yanomami, the Edmonston B live virus caused the 1968 epidemic that afflicted the Upper Orinoco communities. Although acknowledging expert opinions that the vaccine virus cannot cause epidemics, Tierney affirms his view through a tangle of poorly described acts, facts, and dates involving Neel's team. For instance, on p. 71 Neel is said to have ordered the epidemic filmed by Timothy Asch, but on p. 95 he does not want to show the sick on film. On the same page he objects to his team's administering medicines to the Indians, which he considers a waste of research time, but