PROFILE

Profile of Napoleon A. Chagnon

Paul Gabrielsen
Science Writer

Nearly 20 years after leaving the Amazon for the last time, Napoleon Chagnon is retracing his first steps into the jungle. The University of Missouri anthropologist and sociobiologist is archiving and documenting three decades of fieldwork in the Amazonian rainforest for deposition in a University of Michigan data center. Preparing his notes and transcribing more than 250 hours of tape recordings, with the help of a postdoctoral scholar, have transported Chagnon back to the height of his work on alliance and conflict in a tribal society. Listening to the tapes has given Chagnon a renewed perspective on the scope of his scientific accomplishments. "I didn't know I knew so much!" he says.

Chagnon's exhaustive empirical study of the Yanomamö tribe in the Amazon rainforest commenced 50 years ago. Chagnon, elected to the National Academy of Sciences in 2012, also explored how kinship and violence unified and divided these societies. He wove principles of statistics, ecology, and evolutionary biology into cultural anthropology in an effort to define the effect of violence on generations of Yanomamö families and villages. Chagnon's growing archive will preserve for other researchers his experiences living among a previously uncontacted Amazon tribe, an opportunity few anthropologists may ever have again.

Discovering Anthropology

Born in 1938, Chagnon grew up in rural Michigan as the second of 12 children. An avid hunter, Chagnon honed wilderness skills in his teens that would later prove valuable in remote Amazon villages.

The launch of *Sputnik* in 1957 inspired Chagnon, then a recent high school graduate, to study science to aid his country's progress in the nascent Space Race. After a year working as a highway construction surveyor, Chagnon followed most of his hometown classmates to the Michigan College of Mining and Technology in Sault Ste. Marie, where he studied physics.

A friend invited Chagnon, still a freshman, to a recruiting presentation by the University of Michigan in Ann Arbor. Awed by the prestige of the university, he applied for a transfer and was surprised to be admitted for his sophomore year. "I was just thrilled!" Chagnon says. "That's like winning the lottery, where I came from." He enrolled in physics classes taught by 1960 Nobel laureate Donald A. Glaser, and found work as an ambulance driver and dormitory house father to support himself.

Chagnon was also required to take classes in other departments within the College of Literature, Science, and the Arts. The only such course available in his first semester at Michigan was an introduction to cultural anthropology, taught by eminent cultural anthropologist Elman Service. A second course, taught by the equally renowned Leslie White, cemented Chagnon's fascination. "I was hooked after White's second lecture," he says. Chagnon completed a Bachelor's degree in anthropology in 1961 and soon commenced his graduate studies.

Into the Jungle

Whereas other cultural anthropologists studied societies such as urban street gangs, Latin American peasants, or Native American groups living on United States reservations, Chagnon chose a type of society that, in his view, was "the most difficult society to live with that one could possibly pick," an isolated, uncontacted tribe.

In 1964, as a doctoral student, Chagnon traveled to the Amazon rainforest on the Venezuela–Brazil border for a 17-month expedition to study the Yanomamö, a population of around 25,000 people scattered across approximately 250 villages. Some villages had never seen an outsider before. Because of his persistent questioning and the challenging pronunciation of his surname, the Yanomamö nicknamed Chagnon "Shaki," meaning "pesky bee."

Chagnon found a society engaged in frequent intervillage warfare. Conflicts between villages erupted into deadly raids, which in turn spurred retaliatory raids against offending villages. "Few cultural anthropologists had studied a tribe that was still at war without being interfered with by the government or nation-state whose territory they happened to live in," he says. The ongoing violence provided a unique context for the data he collected on genealogies, kinship relationships, and village social structures.

Napoleon Chagnon. Image courtesy of Chris Chagnon.

Chagnon's assessment of the ties holding village-scale societies together formed his doctoral dissertation (1). "Most villages were fission products of a larger village," he says. "The village would grow to a certain size and could not be held together by the traditional mechanisms that are found in tribal society, such as kinship, marriage alliances, and lineage organization."

Chagnon's 1968 monograph, entitled *Yanomamö: The Fierce People* (2), eventually sold nearly a million copies as an introductory-level anthropology textbook (3). Chagnon soon found himself with multiple job offers after graduation, yet chose to stay at the University of Michigan and continue his study of the Yanomamö. "My career in anthropology," he says, "started off with a bang."

Incorporating Ecology

Inspired by works in ecology and evolutionary biology, Chagnon began applying life-science methodologies to anthropology as he

This is a Profile of a recently elected member of the National Academy of Sciences to accompany the member's Inaugural Article on page 16662.

www.pnas.org/cgi/doi/10.1073/pnas.1419269111

investigated the biological foundations of kinship ties. He adopted techniques for calculating genetic relatedness between two genealogically related people as a quantifiable measure of their kinship and used his growing genealogical records to examine how a cultural act, such as participation in intervillage violence, might affect reproductive success.

Chagnon found (4) that 44% of Yanomamö males over age 25 had earned the designation *unokai*, meaning they had killed an opponent in battle. Furthermore, 30% of adult male deaths were a result of violence, and nearly 70% of all adults over age 40 had lost a close relative to violence. Chagnon's research also revealed that 88% of *unokai* were married, compared with only 51% of non-*unokai*. Chagnon acknowledged that various factors may account for this disparity, yet his observations suggested that participation in violent raids, a sign of cultural success, may beget a Darwinian reproductive advantage, a mark of biological success.

In 1975, Chagnon's blend of cultural anthropology and evolutionary biology gained wide recognition with the publication of Edward O. Wilson's *Sociobiology: The New Synthesis* (5). Wilson used his studies of ant behavior to explain the evolutionary basis behind social traits such as altruism and aggression that, he wrote, also applied to human behavior. Because Chagnon was also exploring evolutionary and biological motivations behind Yanomamö behavior, he found himself Wilson's peer and, "by accident," he says, became known as a sociobiologist.

The Meaning of Kinship

Chagnon left Michigan for Pennsylvania State University in 1972. During a sabbatical year at King's College, Cambridge, in 1980, he contributed to a three-year project on sociobiology, collaborating with notable anthropologists Edmund Leach and Meyer Fortes, who strongly disagreed with each other on the principles of kinship. Leach argued that kinship ties were based on shared economic, legal, political, or religious interests (6), whereas Fortes held that the so-called social glue of kinship arose from closeness of ties such as genetic relatedness (7). Chagnon aligned with the latter view, and regarded Fortes as his hero.

Chagnon moved to Northwestern University in 1981 and to the University of California, Santa Barbara, in 1984. By then both Elman Service and Leslie White, along with several of their students, had joined the Santa Barbara faculty. "It was like the University of Michigan-West," Chagnon says. "It was like coming home."

Continuing his study of the Yanomamö, Chagnon investigated the tribe's significance in the region and villages' relationships to each other. In the midst of collecting empirical data, he continued to grapple with central questions surrounding Yanomamö society. "Why is violence so commonplace in this society?" Chagnon asks. "How did disputes emerge and arise between individuals? And what were the consequences for the political organization or village life?"

Chagnon explores some of these theoretical questions in his Inaugural Article (8), which compares human kinship and violence to that of chimpanzees. Chimpanzee violence has been considered as an evolutionary precursor of violent human interactions (9, 10), yet Chagnon says his data reveal more nuances to the comparison. "Humans do things that chimps cannot do," he says, including establishing alliances with groups outside their own through institutions such as marriage. Chimpanzees do not form any exogamous connections outside their own patriarchal lineage, Chagnon says. Yanomamö men who have participated together in deadly raids, however, are related in uniquely human ways. "It's a fundamental dimension of tribal behavior that's all about making alliances with other individuals and communities," he says.

In repeated trips to the Amazon, Chagnon developed field methods of systematic data collection and mathematical data analysis, methods that were codified in a 1974 book, *Studying the Yanomamö* (11), which focuses on a single large village, Mishimishimaböweiteri. The book contains sections on settlement patterns and village interrelationships, note-taking, genealogical data organization, and analytical objectives. The book describes, in Chagnon's words, "everything I had to do to know what I know about that village."

Chagnon found that returning to the United States each time presented a culture shock greater than that of heading into the remote Amazon. "It's much easier now for me to go live with the Yanomamö than it is to come back," he says, adding that the American cultural norm of waiting in lines or rooms has become particularly intolerable.

Retrospection

With access to the Yanomamö increasingly restricted by Venezuelan and Brazilian governments, Chagnon left the Amazon for the last time in 1995 and retired from the University of California, Santa Barbara, in 1999. Following his election to the National Academy of Sciences in 2012, however, the University of Missouri Anthropology Department, headed by one of Chagnon's former students, invited him to join the faculty. A joint appointment at the University of Michigan's Institute of Social Research afforded Chagnon the opportunity to digitize

Chagnon with pioneers of post-Darwinian evolutionary theory in Evanston, IL, circa 1981. Left to right: William D. Hamilton, Richard D. Alexander, Napoleon A. Chagnon, Sewall Wright, and George C. Williams.

and archive his papers in a permanent data repository to be curated and made available to researchers at other universities.

Part of the task, still ongoing, is transcribing audio recordings in the Yanomamö language to English and annotating written notes, a process of "making them intelligible to others besides me," he says. Chagnon is also documenting the unwritten aspects of his research. "The stuff in this archive," he says, "includes the things that are in my head." The tape recordings, some up to 50 years old, remind him of things he once knew about the Yanomamö but had never written down and had since forgotten.

"It's been a very refreshing and worthwhile learning experience," Chagnon says.

1 Chagnon NA (1966) Yanomamö warfare, social organization and marriage alliances. PhD dissertation (University of Michigan, Ann Arbor, MI).

2 Chagnon NA (1968) *Yanomamö: The Fierce People* (Holt, Rinehart & Winston, New York).

3 Eakin E (Feb 13, 2013) How Napoleon Chagnon became our most controversial anthropologist. *New York Times Magazine*, pp 32–37, 51, 53.

4 Chagnon NA (1988) Life histories, blood revenge, and warfare in a tribal population. *Science* 239(4843):985–992.

5 Wilson EO (1975) *Sociobiology: The New Synthesis* (Harvard Univ Press, Cambridge, MA).

6 Leach ER (1961) *Pul Eliya, a Village in Ceylon* (Cambridge Univ Press, Cambridge, UK).

7 Fortes M (1969) *Kinship and the Social Order: The Legacy of Lewis Henry Morgan* (Aldline, Chicago, IL).

8 Macfarlan SJ, Walker RS, Flinn MV, Chagnon NA (2014) Lethal coalitionary aggression and long-term alliance formation among Yanomamö men. *Proc Natl Acad Sci USA* 111:16662–16669.

9 Wrangham R, Peterson D (1996) *Demonic Males: Apes and the Origin of Human Violence* (Houghton Miflin, New York).

10 Wilson ML, et al. (2014) Lethal aggression in *Pan* is better explained by adaptive strategies than human impacts. *Nature* 513(7518):414–417.

11 Chagnon NA (1974) *Studying the Yanomamö*; (Holt, Rinehart & Winston, New York).