

A Dilemma: Economic/Ethnobotanical Research in the Twenty-first Century

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W. Hardy Eshbaugh: 2007 Distinguished Economic Botanist

It is indeed an honor to introduce this year's Society for Economic Botany's Distinguished Economic Botanist, Dr. W. Hardy Eshbaugh. His life has already spanned four careers, any one of which would have distinguished any ordinary mortal. He has not only been an outstanding researcher, but he has been a superlative teacher, organizer, administrator, and conservation leader as well. I will touch briefly on some of the highlights of each of these professional directions.

Hardy's research career has focused on investigations of the origin and evolution of *Capsicum* (chili peppers) and the flora and biogeography of the Bahamas. His published works include two books, over 100 research articles, and more than 20 book reviews. His chili pepper research has taken him to many parts of Central America, the Amazon, and Andean South America. In addition to his New World field studies, he has conducted research in East Africa and South Africa and has participated in several international meetings on the botany of sub-Saharan Africa.

His teaching career blossomed early and often at the Botany Department at Miami University in Oxford, Ohio where he continues to maintain a connection as Professor Emeritus. In 1991, he received the Benjamin Harrison Medallion from Miami University, the institution's highest award for faculty, "...in recognition of contributions to the advancement of education to the nation." In 1992, he was awarded the Botanical Society of America's Certificate of Merit as an "inspiring and caring teacher, dedicated researcher, able administrator and champion of the science of botany." He was awarded an Outstanding Teacher Award at the Greater Cincinnati Consortium of Colleges and Universities Celebration of Teaching in 1992. In 1996–1997, he was selected for the Distinguished Educator Award of the College of Arts and Science at Miami University. In 2006, the Botanical Society awarded him the Centennial Award and the Charles Edwin Bessey Award for his "...continuing efforts to bring additional understanding of the natural world to the public at large." Dr. Eshbaugh has extensive international experience, having taught and led field natural history courses in the Bahamas, Nova Scotia, Newfoundland, Amazonian Peru, Costa Rica, and Uganda. His former students are numerous and they all seem to speak with the same admiration for his efforts as a knowledgeable and compassionate instructor.

As a true naturalist, his love of the outdoors and depth of understanding have led him to devote his energies to various conservation initiatives. In February 2005, he was awarded The Great Egret Award by the National Audubon Society in recognition of his lifetime of service to the cause of conservation at the national, state, and local levels. In 2006, the St. Mary's River Association in Nova Scotia selected him as their Conservationist of the Year. He received the Ohio Biological Survey's Osborn Award in 2006 "...to recognize noteworthy accomplishments and service in the field of biology." Always a direct, but persuasive speaker, he was awarded the Outstanding Communicator Award of the Ohio Ornithological Society in 2007. Because of his many

contributions to the conservation community in Ohio, he was selected as Oxford, Ohio's Citizen of the Year. In recent years, Hardy has focused most of his conservation efforts in the developing world, where his participation in ecotourism has emerged as an effective tool to promote understanding and awareness.

Not only has he been an outstanding researcher, teacher, and conservation activist, but Hardy has used his considerable talents as an organizer to administer a variety of professional and nonprofit organizations, as well. He served on the Board of Directors of the National Audubon Society for many years (1994–2006) and took a leadership role as Vice-Chairman for a portion of that time. He has served as president of several professional organizations, including the American Institute of Biological Sciences (1996), the American Society of Plant Taxonomists (1991–1992), the Botanical Society of America (1988–1989), and the Society for Economic Botany (1983–1984). He is a Fellow of the American Association for the Advancement of Science (1990) and the Ohio Academy of Science (1977). He has been Associate Program Director for Systematic Biology at the National Science Foundation (1982/83) and Vice-Chairman of the Ohio Chapter of The Nature Conservancy (1970/75). He served as one of the Co-chairs of the Systematics Agenda 2000—Charting the Biosphere initiative, a significant multi-institutional effort that helped to draw national attention to the need for renewed support for research in systematics. Currently, he is the President of the Elizabeth Wakeman Henderson Charitable Foundation, he is on the Board of the bi-national Atlantic Salmon Federation (2002–2008) and the Hawk Mountain Sanctuary (2007–present), he is President of the Avian Research and Education Institute (2005–present), and he serves on the Board of Directors of the American Botanical Council.

In closing, Dr. Hardy Eshbaugh is having an exemplary career as a scholar, teacher, administrator, and ardent conservationist, and the devotion of his life to so many worthy pursuits serves as an extraordinary example to us all. Because of his

many contributions to botanical science and society, in general, we are proud to name him as this year's Distinguished Economic Botanist.

Introduction by David L. Lentz
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I have reached a point in my life where one does not anticipate many surprises; and when they come, they are too often unpleasant. Thus, I must admit that I was very pleasantly surprised when David Lentz called to inform me that I had been selected to be the 2007 Distinguished Economic Botanist. It is an overwhelming honor as well as very humbling to join the company of those who have received this award before me. When I realized I would be speaking to you tonight, the first thing I did was to go back over previous Distinguished Economic Botanist Award lectures given over the years. Most of those had an autobiographical twist. As I have reflected on my chosen career as a botanist, certain people come to mind. My parents certainly nurtured my interest in nature. We were what would be considered an outdoors family. But it is the many professionals and institutions on my journey to which I am especially indebted. That journey began with a fourth grade teacher who took me on my first organized field trip, to my high school biology teacher, David Twitchell, and my chemistry teacher, John Howland, who urged me to go to Cornell. Five people at Cornell changed my life forever: Harlan Banks, a master teacher who opened my eyes to botany in ways I could not have imagined; Arthur Allen, who spent many hours talking with this young freshman about the wonderful world of birds; Dave Bierhorst and John Kingsbury, who had faith in me in spite of my undergraduate record; and Richard Fisher, who showed me how to teach an effective field course and to use an inquiry-based approach to teaching. By some good fortune, I chose to go to Indiana University for graduate school. There, three people made the difference for me: Charley Heiser, Marcus Rhoades, and David Frey. In my

first semester, I took Charley Heiser's Economic Botany course; my life has never been the same. I also ended up doing my dissertation research on chili peppers, *Capsicum*. Ultimately, I ended up at Miami University and spent 31 years as a professor having the privilege of teaching and developing the courses Plants and Civilization, Economic Botany, and Contemporary Issues in Ethnobotany while doing research on chili peppers and the flora of the Bahamas. I had wonderful classes to teach and truly exceptional undergraduate and graduate students who chose to work with me. However, none of this journey would have happened without the encouragement, love, and support of my wife Barbara, who accompanied me on this journey. My first research trip was a 4-month soiree in 1970 and 1971 from northern Ecuador to southern Bolivia with Barbara and three of our children ages 10, 8, and 6. It was an unforgettable journey and certainly gave me insights that shaped my teaching and research for the rest of my career, but that is enough of reminiscences.

I wrestled with my topic for tonight's address knowing that most of you would anticipate that I would talk about peppers. It is true that peppers have been a major part of my life, but that life ended when my entire germplasm collection was destroyed by the malfunction of the seed storage facility at Miami University in 1996: 35 years of collected pepper germplasm was roasted into sterility over a 1-week period. For more about my life with peppers you can read Amal Naj's 1992 book, *Peppers: A Story of Hot Pursuits*. Instead of peppers, tonight I want to draw from my experiences of teaching a course in Contemporary Issues in Ethnobotany and working with graduate students in the field of ethnobotany.

Economic and ethnobotanical research has a dilemma. In a word, the dilemma facing the professional and student economic/ethnobotanical researcher and scholar alike in the twenty-first century is ethics. Much has been written and said about ethics as it relates to ethnobotanical research (Alexiades 1996; Cotton 1996; Cunningham 1996; Elvin-Lewis 2006; and Huft 1995, among many others). The Elvin-Lewis paper is of such

importance that it should be required reading by all economic botanists and ethnobotanists. Three of the major events leading up to where researchers in the fields of ethnobotany and economic botany find themselves now include: World War II and the Nuremberg Code established in 1949, the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora established in 1973, and The Convention on Biological Diversity established in 1992.

Far too little has been written and spoken about the inherent difficulties created by institutions as they apply the standards to which researchers and scholars are being held with respect to human subjects. Historically, we are all held accountable to the Nuremberg Code, the Belmont Report, and the Declaration of Helsinki, all of which set the ethical standards and expectations for investigation involving human subjects. At the same time, biologists doing non-medical or non-psychological research with human subjects are bound by the expectations of these codes and declarations. Thus, at our various institutions, prior to initiating research, we fall under the purview of a Human Subjects Committee and Institutional Review Board. The continuing problem that ethnobotanical and economic botany researchers find themselves in is that Human Subjects Committees are guided primarily by a set of strictures established by and through the National Institutes of Health that ultimately has all investigators take a course in The Protection of Human Research Subjects (CITI) and pass a test based upon this course before any research involving human subjects can be initiated. Unfortunately, this ethics test is designed primarily to target those doing medical and psychological research. The CITI course and test have little bearing on the kind of research that the economic botanist/ethnobotanist undertakes. It gives little consideration to the research from the perspective of the human subjects being investigated and it gives little or no concern to the voice of the people being investigated.

Who owns the data we discover and uncover when we do research of an indigenous people and

culture? When we learn about various plants and their uses from indigenous consultants, who owns and is the keeper of that information? How does the investigator meet the expectations of the people with whom he or she works and studies? On the surface, the answers to these questions are simple; but when we delve deeper into the questions, we find that the answers are much more complex than we had anticipated. The well-trained ethnobotanist will consider these questions, be sensitive to the people with whom he or she is working, and recognize that the investigation is a two-way street with legitimate expectations both from the investigator and from the people under study.

For the past 8 years, Dr. Michael Gilmore (2005) has studied with and learned from the Maijuna Indians, an indigenous culture of the Sucusari River, a tributary to the Napo River in Amazonian Peru, doing an ethnoecological and ethnobotanical investigation. His study serves to show the many complex and intricate ethical issues the student of ethnobotany faces when initiating and carrying out such a study. Under the Nuremberg Code, informed consent is mandatory. Institutional Human Subjects Committees require such documented consent before a research project can begin. The expectation rests with the researcher that he or she can articulate the research and make it understood to the people being investigated. There is an expectation that everyone involved in the study will have been asked to give signed consent. The entire Sucusari Village was called together to learn about the project when Dr. Gilmore first arrived at his study site. Community members had an opportunity to ask questions about the project and have those questions answered to their satisfaction. Finally, all community members who chose to participate in the project were asked to sign a document attesting to that fact. Of course many community members, especially some of the oldest, could not read, write, or sign their names and ultimately a mark—or “x”—had to suffice as documentation of informed consent. This document was later authenticated and notarized. Does

such consent meet ethical standards? The answer is yes but...is a mark a signature? Who legitimately speaks for the community? The concept of informed consent is difficult to understand when a people come from a completely different cultural context. Sometimes the whole research process itself is completely foreign and asking a people to sign a paper in order to talk with them is even more so. Gaining informed consent is a much messier and more complex process than most researchers and Human Subjects committees acknowledge.

Early in this study, it became clear that many of the consultants were proud of what they knew and expected to be given credit for the knowledge they shared with Dr. Gilmore. Such expectations pose another problem. How does the investigator protect the identity of a consultant when the consultant expects to receive credit for the information given? Ethical protocol demands such assurances of anonymity. An Institutional Human Subjects exit document has an expectation when it asks the following: "I have removed all identifiers (names and codes) from my data so it is not possible to link specific responses with individual respondents" (Anonymous 2004). If the response is "I have not removed all identifiers..." (Anonymous 2004), the investigator is required to give a detailed explanation and justification for not doing so. In this case, the following explanation was given: "Furthermore, in the original agreement with the Maijuna, it was understood that the data sets ... collected were in fact the intellectual property of the Maijuna and the appropriate distribution of those data sets would be determined by both the investigator and the Maijuna. The Maijuna have an expectation that their names will in fact remain associated with the data" (Eshbaugh 2006). This expectation regarding data is not unusual. Many indigenous and traditional people take great pride in their knowledge and many feel cheated or demeaned when no recognition is accorded to their efforts and unique contributions to a study. In McClure and Eshbaugh's 1983 study, "Love Potions of Andros Island, Bahamas," one of the

primary consultants, Ms. Amelia Marshall, as well as the other six consultants considered themselves to be the primary dispensers of medical botany knowledge on North Andros Island and expected to be recognized by those with whom they had collaborated. Nonetheless, when the results of the research were published, although the names of all the consultants appeared in the paper, the documentation of informed consent that was originally in the acknowledgements was omitted. Such unfortunate editorial decisions can lead to misunderstandings at both the local and professional level.

Simpson and Ogorzaly (2001) provide a sidebar discussion of some of the complexity of these issues. "Since 1990 there has been growing concern over the rights of indigenous people to intellectual and biological property. As investors from developed countries scramble to claim rights to the world's flora and fauna and capitalize on the knowledge of native people, the world community struggles to come up with sensible regulations. The need for such agreements stems from exploitive practices by individuals and pharmaceutical and seed companies from the developed world." There are many awful examples of exploitation of indigenous peoples by individuals, agencies, and governments. There are, in fact, too many of these cases to cite here, but legal action has been used to nullify a number of agreements and patents. Today, biopiracy is rampant but often disguised. The Convention on Biological Diversity is dedicated to promoting sustainable development. The Convention recognizes that biological diversity is about more than plants, animals, and microorganisms and their ecosystems. It is about people and the need for food security, medicines, fresh air and water, shelter, and a healthy environment in which to live. It was signed by many countries and ratified by other nations at the 1992 Rio Earth Summit. Nonetheless, although President Clinton signed the document, the United States Congress never ratified it. Other nations that have not ratified the convention include Andorra, Brunei Darussalam, the Holy See, Somalia, and Iraq. One may well ask

why the United States has not ratified the Convention. The answer lies in part in a dispute surrounding intellectual property rights and ownership. Under this agreement, people have rights to the plants and animals native to their countries and to the knowledge of indigenous peoples. This is a point still being argued, especially in the context of fair compensation for intellectual property and the biodiversity unique to a particular country (Fowler and Mooney 1990).

The question of giving credit where credit is due has led to some novel approaches. The recognition that monetary benefits should accrue to indigenous peoples for their intellectual property is now generally accepted, although Brush (1993, 1998, 2004) has argued that compensation may cause more harm than good under certain circumstances. The issue of compensation for “nonmonetary” benefits is much more contentious. In other words, how to best compensate people for their intellectual contribution to an investigation is not clear. Here I am attempting to distinguish between property, with its recognized value, versus contribution, which too often goes unrecognized for its value. A model approach to compensating indigenous peoples for their intellectual contribution can be seen in the paper “Rights to the Benefits of Research: Compensating Indigenous Peoples for their Intellectual Contribution (FSI and Kothari 1997).” One of the more unusual aspects of the paper is its authorship where a foundation appears as the senior author and an individual researcher, Brij Kothari, as the second author. The Fundación Sabiduría Indígena (FSI) or Foundation of Indigenous Wisdom was created in Ecuador as a part of Kothari’s and the community’s project. This grassroots foundation is entirely managed by campesinos and is dedicated to the investigation and documentation of indigenous knowledge for and by the local people. While Gilmore (2005) was working with the Maijuna, he helped the Maijuna to set up their own indigenous federation called FECONAMAI (Federación de Comunidades Nativas Maijunas) to (1) conserve Maijuna culture, (2) conserve the environment,

(3) better organize the four existing Maijuna communities, and (4) preserve the Maijuna language. In the future, FECONAMAI or the Sucusari Village may find and expect that they are the senior authors of research publications. These two efforts that arose ancillary to the research being undertaken provide a voice to the people with whom the investigators collaborated. In a very real sense, these initiatives empowered the people.

There is another aspect of giving first authorship to such a foundation or federation that needs to be considered. An extremely ethical act like this may, in fact, hurt the researcher in the current academic reward system. The question is this: Does the current academic system support such ethical acts or discourage them?

Posey (2002) writes at length about the “commodification of the sacred,” and points out that it may be difficult for someone not from the culture to comprehend that an entire plant, or area, or special place on the landscape may be sacred to that culture. By extension, such plants and places have value beyond monetary compensation to the culture and, ethically, that has to be recognized and respected by the researcher. Too often, the researcher may fall into the trap of the “inadequacies of intellectual property rights.” As Posey (2002) noted, intellectual property rights recognize individual—not collective—rights, simplify ownership regimes, stimulate commercialization, recognize only market values, are subject to economic powers and manipulation, are difficult to monitor and enforce, and are expensive, complicated, and time consuming.

One of the more powerful tools being used by some ethnobotanical researchers and conservation biologists today is ethnocartography (Chapin and Threlkeld 2001; Herlihy 2003; Gilmore 2005). The field of ethnocartography can be traced back to Tolman (1948) who introduced the concept of cognitive mapping. Maps produced from memory in participatory mapping endeavors can unlock the community landscape of the past as well as the present.

As powerful as ethnocartography (participatory research mapping/cognitive mapping) may be, it

carries with it a heavy burden of ethical considerations. Using this methodology, “indigenous peoples with little formal education work with researchers to transform their cognitive knowledge into standard cartographic and statistical forms easily understood by themselves and outsiders” (Herlihy 2003). In such studies, it is the indigenous people who own the knowledge (it has been mentioned that, in a real sense, this knowledge is co-owned by the indigenous people and the investigator without whose help the cognitive maps would never have been constructed). Nonetheless, it is their intellectual property. Indigenous knowledge can be empowering and destructive at the same time. It provided the Maijuna (Gilmore 2005) with the first comprehensive database of their world, as seen through their eyes, that was not passed on from generation to generation simply through an oral tradition. However, once recorded, these data, unless protected, could become available to outsiders beyond the Maijuna community and that poses possible dangers. For example, once outsiders have knowledge of rare resources, they could be expropriated and exploited to the detriment of the Maijuna. The power of such cognitive mapping goes far beyond the production of a map. Such maps may have legal standing in any land-claim action. Such a map may for the first time set the legal boundaries to indigenous territories and establish a claim to resource rights. The dilemma for Gilmore (2005) was how to protect the information that the Maijuna hold “secret” while at the same time providing a map that could be used as a teaching instrument to a younger generation, the school children in the village. The solution, though not perfect, was to produce two maps: One containing all the information and one excluding the “secret” information that the Maijuna did not want known outside the community. These maps were presented to the community in a ceremony in May 2006. The map without the “secret” information now hangs in the school for both Maijuna and outside eyes to see and is a source of pride in the community. The other is in the

hands of the community leader and the Maijuna tightly control who has access to the map and its culturally important information. Herlihy (2003) asks the question, “Are maps dangerous for indigenous peoples?” Without question, the answer would be “yes” if the confidential information falls into the wrong hands. The issue of ownership of the information collected by a principal investigator versus the collaborators with whom she or he has worked can and has been very contentious as seen in Herlihy’s (2003) lengthy discussion.

Here are some other issues worth considering. In 1976, I was traveling in the southern Mexican state of Chiapas collecting pepper (*Capsicum*) germplasm for my research studies. My son Steve and I spent a lot of time visiting Tzeltal villages in this quest. When we returned to our accommodations one afternoon, I was approached by an extremely scruffy individual who began asking me a lot of questions about where I had been, what had I been doing, and if I had seen anybody growing drug plants. I asked why he wanted to know this information whereupon he produced his wallet and a card indicating that he was a U.S. narcotics agent. This was long before the war on drugs. Nonetheless, this posed an ethical dilemma. From my viewpoint, the answers to his questions were none of his business, but it was an intimidating situation. I told him that I had seen no one growing drug plants and that was true. I knew there was a lot of drug activity in the area. What if I had told him that I had seen some of the people in the area growing drug plants? How would that information have been used? A number of years later, one of my students, Jay Willian (1989), was doing research with the Avá native people and highland settlers in the vicinity of the village of Muyupampa, Bolivia. By this time, the United States was in a full-fledged drug war and it extended deep into the Bolivian outback. The ethical dilemma that was posed was an expectation by the scientific community and a conflicting expectation of confidentiality by the Avá community. According to science, results should be repeatable for validation. For the

science to be repeatable, the investigator has to reveal methods, locations, and arguably, the names of consultants. At the same time, if this information were to be revealed, it may well put the subjects of the research study in jeopardy. In the case of Willian's research, he learned much about coca use in the region. He learned it was not grown in the region but trucked in from the outside. Had it been grown in the area, that information as well as other information could have been of use to any agency that wanted to eliminate a major coca-growing region and perhaps even eliminate the growers. Coca is grown and processed in many area communities. Had Willian's work been done in one of those communities, the dimensions of his ethical dilemma would have been very real.

Here are two last examples of the ethical conundrum faced by the ethnobotanical researcher. When Bolyard (1981) was doing her research for the "Medicinal Plants and Home Remedies of Appalachia," she spent many hours walking in the woods with consultants in southeast Kentucky. One of the most important medicinal plants being used by the people of this region was ginseng. By that time, ginseng was a protected plant in Kentucky and fell under the regulations of CITES. Revealing the name of one of her consultants would have put him in jeopardy and revealing the location would have brought even more collectors to the area most likely extirpating the species from this area. In another case, in her 1999 study of *Mitchella repens* L., Beck found that seventeen medicinal plant practitioners were dispensing various plant products as medicines in northeastern Ohio (Beck 1999). They indicated that confidentiality was of the utmost importance because if it became known that they were herbalists and actually dispensing plant extracts as medicines, there would be pressure to put them out of business and perhaps even prosecute them. In this case, confidentiality may trump other ethical considerations. At the same time, an investigator might encounter illegal activities, e.g., child or spouse abuse, with far greater implications that would require the revelation of one's informants.

In the several examples cited above, sometimes people requested confidentiality; at other times, they wanted their names to be used and their level of knowledge acknowledged. This simply reinforces my earlier point that often the Human Subjects rules are just too simplistic for the complex realities of ethnobotanical research. It is true that Institutional Review Boards have wide latitude in their interpretation of Federal guidelines, but there is no consistency from one academic institution to another. While one institution's interpretation of guidelines may seem reasonable, another's may be perceived as onerous.

This brings me to my conclusion. There is a future for ethnobotanical and economic botany research in the twenty-first century. In many cases, the research that is undertaken will lead the investigator through a minefield of ethical considerations. Are most researchers prepared for this minefield? The fact that there is a minefield waiting for us out there highlights the need to properly prepare oneself to make the suitable decisions. That should not stop the research or the researcher, but it will bring a heightened level of awareness of ethics, as it must! Unfortunately, ethics is not as big of a part of many ethno/economic botanical courses or programs as it should be and that is both unfortunate and inexcusable. Clearly, the challenge is for students, professors, and programs to make ethics a larger part of their curriculum to reflect its true importance. As one reviewer suggested, "Those teaching research methods classes in ethnobotany as well as various social sciences could include mock Institutional Review Board protocols and reviews in their classroom projects." We owe that to the people whom we study and with whom we collaborate.

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