

**EXPLORATION, SCIENCE, AND SOCIETY IN
VENEZUELA'S CAVE LANDSCAPE**

by

María Alejandra Pérez

**A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Anthropology)
in The University of Michigan
2012**

Doctoral Committee:

**Professor Erik A. Mueggler, Chair
Professor Arun Agrawal
Professor Gillian Feeley-Harnik
Professor Bruce Mannheim
Assistant Professor Matthew Hull**

© María Alejandra Pérez
2012

To Erik, Andrea, and
the enchanted geckos lost in the forest

Table of Contents

Dedication	ii
Acknowledgments	iii
Chapter 1. Introduction	1
Introducing Speleology	
A Brief History of Speleology	
Broadening the Historical and Cultural Examination of Human-Cave Relations	
Human-Cave Relations in Venezuela	
Study History and Methods	
Chapter Summaries	
Chapter 2. Of Monuments and Men: The Exploration of Guácharo Cave and the Origins of Venezuelan Speleology	40
Guácharo Cave in Time and Space	
Guácharo Cave in Indigenous Cosmology and Practice	
European and Creole Incursions into Guácharo Cave	
Humboldt In and Beyond Guácharo Cave	
Speleological Incursions into Guácharo Cave	
The Speleology Section of the Venezuelan Society of Natural Sciences	
A Change of Leadership and a New Vision of Venezuelan Speleology	
A New Generation of Speleologists	
The 1965 Guácharo Cave Expedition	
Tensions Rise within Guácharo Cave... and Shake Up Venezuelan Speleology	
Two Leadership Styles, Two Visions of Speleological Science	
Guácharo Cave is Mapped... but Mysteries Remain	
Conclusion	
Chapter 3. Producing Speleological Knowledge, Producing Society: The Cadastre as Boundary Object	96
A Race to Establish a National Cave Inventory	
Antecedents and Origins of the Boletín de la Sociedad Venezolana de Espeleología	
The First Volume	
Defining Cadastral Standards, Defining Society	

We Came Together at the Map: The Cadastre as a Boundary Object	
The Cadastre as Methods Control	
Valuing Caves	
Conclusion	
Chapter 4. Exploring and Mapping Caves	147
Mapping Caves	
Vision and Perspective in/of the Cavescape and its Representation	
The “Mapping What You Survey” Imperative	
Challenging Dichotomies of Ways of Experiencing/Representing the World	
Conclusion	
Chapter 5. Reading Cave Maps: Correspondence, Continuity, and Growth of the Speleological Cadastre of Venezuela	185
Experience/Representation	
Reading the Cave Map	
Reading the Cadastre	
Conclusion	
Chapter 6. Encounters with/in the Cave Frontier: Speleology as Boundary Practice	217
Exploring the Karst of Northern Monagas: From Contact to Engagement	
Cultural Encounters, Revisited	
SVE-Baquiano Relations Remembered	
Carlos Galán	
Baquianos as Hired Laborers in Comparative Perspective	
Spaces of Ecstatic Encounter... but also of Socialization and Alienation	
Speleological Practice and the Minimalist Ethic	
Forging New Paths and Relations: 2002 and 2008 SVE Monagas Expeditions	
The 2002 Expedition	
The 2008 Expedition	
Conclusion	
Chapter 7. Territoriality and the Making of Nation	274
Beyond State and Capitalist Cartographies	
Caves as Spaces of Subversion/State Control?	
Surveying and Accessing the Venezuelan Cavescape: Speleological Collaborations with the State	
State and Civil Territoriality and Speleological Practice	
A Broader Geopolitics of Speleology	
Conclusion	
Chapter 8. Conclusions	298
Adventures in Caving, Adventures in Anthropology	
Coda: Guácharo Cave Opens Up	

Appendix	320
Bibliography	334

Acknowledgments

Embarking on this project has been an extraordinary privilege. I consider myself lucky to have dedicated the last 10 years of my life to an education in anthropology and a project that has been so meaningful to myself and so many that I love, respect, and admire.

I want to thank my committee. My chair Erik Mueggler has been a kind and constant mentor whose own work has inspired me in more ways than he can imagine. Counting on Gillian Feeley-Harnik's warmth and guidance has been a gift. I am certain that this project falls short of her high expectations, but at least I am happy to say that *that* did not keep me from trying. Matthew Hull, ever the cheerleader, kept convincing me of the value of my work when I doubted it myself. His suggestions on how to approach my writing (do not struggle, keep cycling through every chapter for a week or two at a time) were critical in getting it done (and enjoying the process). I thank Arun Agrawal for creating, along with Rebecca Hardin, a wonderful space for friendly scholarly engagement with other graduate students. "Club Agrawal," as us members jokingly called it, provided a safe space to share early ideas of this project. It is the better for it. Bruce Mannheim gave me guidance and strength when I needed it most. Without him, I would not be writing these words today. Until his passing in August of 2011, I counted on the mentorship of Fernando Coronil. As co-chair and mentor, he was a critical and jovial interlocutor who taught me the essence of anthropology: to question categories.

I also want to thank Holly-Peters Golden, Larry Hirschfeld, Douglas Medin, Stuart Kirsch, Katherine Verdery, Julie Skurski, Tom Fricke, Peter Richardson, Frank Yates, and Eduardo Kohn for support and feedback along different stages of my graduate career. Laurie Marx's guidance as Graduate Coordinator and unwavering support as friend were critical during my years in the department. I made wonderful friends among other students while at Michigan. Special thanks to Susanne Unger, Junehui Ann, Jessica Robins, Cat Bolten, Xochitl Ruiz, Bridget Guarasci, Cecilia Tomori, Katherine Martineu, Emily McKee, Karen Herbert, Oana Matescu, Jill Constantino, Genese Sodikoff, Paolo Sosa, Nicola Knight, Crystal Fortwangler, Josh Reno, Michael Hathaway, and all of my friends of the now defunct Culture and Cognition Program. When I heard that one of my committee members accidentally had not received my thesis just a week prior to my defense, Jessica Robbins printed a copy and delivered it in person! Jessica also took wonderful notes throughout my defense's two hours of engaging conversation. Aixa Alemán, now an aspiring anthropology graduate student herself, has been an extraordinary friend and colleague who has inspired me with her tenacity. Her ideas helped this project (and its author) grow.

Working as a graduate student instructor with Holly Peters-Golden and Milford Wolpoff was an invaluable experience. Both in their own ways epitomize excellence in education. May I be as committed to my students in the future as they were with theirs. Holly and Milford were only the most recent of a long line of exceptional educators from whom I have learned so much along my journey in both North and South America. In Caracas, I was a student in two wonderful schools: Montecarmelo Elementary School and Washington Academy. To Rosa Cedeño, Kathy Tugendhat, and Freddy Yáñez, who

insisted in always looking at the other side of the coin, I extend a special thank you. In Trinidad, Colorado, my chemistry teacher James Cihura encouraged me to attend the Frontiers of Science Institute, an experience that first introduced me to the challenges and joys of research and a college education in the United States. During my undergraduate years, also at the University of Michigan, my participation in the Undergraduate Research Opportunity Program led to two extraordinary years working in Dr. Benedict Luchessi's cardio-pharmacology lab. I still remember him showing me the wonders of the heart's automaticity. I have strived to maintain that sense of wonder at learning new things and celebrating it in others (including the speleologists I feature in this project) ever since. Thank you to my undergraduate advisor, Marsha Pumroy, and my professors Randy Tessier and Michael Kennedy.

During my sophomore year at Michigan I was one of several scholars in the Minority International Research Training Program that Michigan's Center for Human Growth and Development has been coordinating since the early 1990s. With this program I participated in a bioanthropological study in Bolivia under the direction of Roberto Frisancho and Stephen Farrow. It was in the summer of 1995, deep in the Bolivian Yungas, that I fell in love with anthropology. I thank Roberto for his unwavering support, although he would have rather I stay in the biological side of the discipline. He warned me that bioanthropologists seek out connections between things, while their cultural counterparts do something much harder: they create new things. While not in total agreement with that view, I am quite happy I took the more creative path. I thank Stephen, for saving my life on that mountain in La Paz. Also in Bolivia I gained one of

my dearest friends, Gloria Wheatcroft, who has encouraged me along this and many other long journeys.

The Center for Human Growth and Development became a special home for me. Its director of many years, Betsy Lozoff, has been and remains an extraordinary mentor, friend, and inspiration on all matters of life. A warm thank you to this Center's faculty and staff for helping me gear up and make it through graduate school. Other units at the University of Michigan that deserve my recognition are the Women in Science and Engineering Program, the Sweetland Writing Center, and more recently the office of the Alliance for Graduate Education and the Professoriate.

I benefitted from a number of scholarships from the University of Michigan Rackham Graduate School: the Rackham Merit Fellowship (2001), several summer research awards, and a Rackham One Term Dissertation Fellowship as I wrapped up my writing (2011). This project also was funded by a scholarship from the National Speleological Society. The National Science Foundation funded my participation in the 2004 Summer Institute for Research Design in Cultural Anthropology, which helped me define my identity as a researcher, although perhaps not in the ways the program's excellent instructors intended.

During my writing, I have counted on the support and friendship of people at the University of Iowa: Angeliqe Dwyer, Emily Wentzell, Tina Ortiz, Tony Pomales, and Misha Quill have helped me feel connected to a university after leaving Ann Arbor in 2006.

I turn now to cavers that have kindly made me one of their own. A special thanks to Rane Curl, my cartography instructor Patricia Kambesis, and Iowa Grotto president

Mike Lace. In Venezuela, I thank all members of the Venezuelan Speleological Society, past and present, and their families. The memory of Juan Antonio Tronchoni encouraged me everyday of my research in Venezuela, and does still. Much of this work builds on the meticulous historical research of life-long SVE member and geologist Franco Urbani. He patiently answered many questions while I was writing. A special thank you to Franz Scaramelli, Francisco Herrera, Carlos Galán, Carlos Bordón, Carlos Tinoco, Maribel Ramos, Luz María Rodríguez, Miguel Angel Perera, Pedro Aso, Carlos Bosque, Omar Linares, Kay Tarble, Alejandro Reig, Bernardo Urbani, Neyla Medina, Tomás Straka, Horacio Biord, and Dylcia Caires. In Caripe, the Salazars opened their home to me, and soon, their hearts. Also from Caripe, I thank all of the guides and staff of Guácharo Cave, particularly Park Superintendent Buitriago and cave guides Govinda Galindo and Benito Rodríguez. To Arquímedes Velásquez of the Asociación Pueblo Chaima Caripe (Association Chaima People Caripe) I am grateful for his guidance on the ongoing political and cultural struggles of the Chaima indigenous community on northern Monagas. The support and friendships of Beatriz de Bellard and María Fernanda Tronchoni were critical to the success of this project. In both I found kindred spirits: all three of us are daughters enamored with the intertwined legacies of our speleological fathers.

At Venezuela's Instituto Nacional de Parques (National Institute of Parks), I want to thank Gustavo Jiménez for helping me with the necessary permits.

None of this, neither the dissertation nor all of the education that preceded it, would have been possible without my family. In Caracas, my uncle Juan Rubio and aunt Clotilde Pesquera cared for me as they would have their own daughter. My parents-in-

law Nancy and Carl Rader have been an overwhelming source of love and support on all matters of life since we first crossed paths back in 1994. Mike and Marilyn Agin offered key graduate school guidance and even cleaned after me (and my car!) on that fateful day when Thai food was not as fresh as it should have been. Thank you.

My dear parents Wilmer and Mirza Pérez and brothers Carlos Luis and Carlos Eduardo... Where to begin? I could not have dreamed of a more wonderful family. May we continue sharing many adventures together for many years to come.

I dedicate this dissertation to my husband Erik Paul and daughter Andrea Sofía. Erik has been a steadfast companion, even as my explorations have lead me to deep, dark, and unexpected places. He has gifted me with the strength and freedom to grow from my journeys and come home. Thank you, Sweet Love. I started to write in earnest once I learned I was pregnant. In a way, then, this document is little Andrea's twin sibling! Gracias, mi Chupis, por ser.

To learn about those enchanted geckos, read on...

**EXPLORATION, SCIENCE, AND SOCIETY IN
VENEZUELA'S CAVE LANDSCAPE**

by

María Alejandra Pérez

**A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Anthropology)
in The University of Michigan
2012**

Doctoral Committee:

**Professor Erik A. Mueggler, Chair
Professor Arun Agrawal
Professor Gillian Feeley-Harnik
Professor Bruce Mannheim
Assistant Professor Matthew Hull**

© María Alejandra Pérez
2012

To Erik, Andrea, and
the enchanted geckos lost in the forest

Table of Contents

Dedication	ii
Acknowledgments	iii
Chapter 1. Introduction	1
Introducing Speleology	
A Brief History of Speleology	
Broadening the Historical and Cultural Examination of Human-Cave Relations	
Human-Cave Relations in Venezuela	
Study History and Methods	
Chapter Summaries	
Chapter 2. Of Monuments and Men: The Exploration of Guácharo Cave and the Origins of Venezuelan Speleology	40
Guácharo Cave in Time and Space	
Guácharo Cave in Indigenous Cosmology and Practice	
European and Creole Incursions into Guácharo Cave	
Humboldt In and Beyond Guácharo Cave	
Speleological Incursions into Guácharo Cave	
The Speleology Section of the Venezuelan Society of Natural Sciences	
A Change of Leadership and a New Vision of Venezuelan Speleology	
A New Generation of Speleologists	
The 1965 Guácharo Cave Expedition	
Tensions Rise within Guácharo Cave... and Shake Up Venezuelan Speleology	
Two Leadership Styles, Two Visions of Speleological Science	
Guácharo Cave is Mapped... but Mysteries Remain	
Conclusion	
Chapter 3. Producing Speleological Knowledge, Producing Society: The Cadastre as Boundary Object	96
A Race to Establish a National Cave Inventory	
Antecedents and Origins of the Boletín de la Sociedad Venezolana de Espeleología	
The First Volume	
Defining Cadastral Standards, Defining Society	

We Came Together at the Map: The Cadastre as a Boundary Object	
The Cadastre as Methods Control	
Valuing Caves	
Conclusion	
Chapter 4. Exploring and Mapping Caves	147
Mapping Caves	
Vision and Perspective in/of the Cavescape and its Representation	
The “Mapping What You Survey” Imperative	
Challenging Dichotomies of Ways of Experiencing/Representing the World	
Conclusion	
Chapter 5. Reading Cave Maps: Correspondence, Continuity, and Growth of the Speleological Cadastre of Venezuela	185
Experience/Representation	
Reading the Cave Map	
Reading the Cadastre	
Conclusion	
Chapter 6. Encounters with/in the Cave Frontier: Speleology as Boundary Practice	217
Exploring the Karst of Northern Monagas: From Contact to Engagement	
Cultural Encounters, Revisited	
SVE-Baquiano Relations Remembered	
Carlos Galán	
Baquianos as Hired Laborers in Comparative Perspective	
Spaces of Ecstatic Encounter... but also of Socialization and Alienation	
Speleological Practice and the Minimalist Ethic	
Forging New Paths and Relations: 2002 and 2008 SVE Monagas Expeditions	
The 2002 Expedition	
The 2008 Expedition	
Conclusion	
Chapter 7. Territoriality and the Making of Nation	274
Beyond State and Capitalist Cartographies	
Caves as Spaces of Subversion/State Control?	
Surveying and Accessing the Venezuelan Cavescape: Speleological Collaborations with the State	
State and Civil Territoriality and Speleological Practice	
A Broader Geopolitics of Speleology	
Conclusion	
Chapter 8. Conclusions	298
Adventures in Caving, Adventures in Anthropology	
Coda: Guácharo Cave Opens Up	

Appendix	320
Bibliography	334

Acknowledgments

Embarking on this project has been an extraordinary privilege. I consider myself lucky to have dedicated the last 10 years of my life to an education in anthropology and a project that has been so meaningful to myself and so many that I love, respect, and admire.

I want to thank my committee. My chair Erik Mueggler has been a kind and constant mentor whose own work has inspired me in more ways than he can imagine. Counting on Gillian Feeley-Harnik's warmth and guidance has been a gift. I am certain that this project falls short of her high expectations, but at least I am happy to say that *that* did not keep me from trying. Matthew Hull, ever the cheerleader, kept convincing me of the value of my work when I doubted it myself. His suggestions on how to approach my writing (do not struggle, keep cycling through every chapter for a week or two at a time) were critical in getting it done (and enjoying the process). I thank Arun Agrawal for creating, along with Rebecca Hardin, a wonderful space for friendly scholarly engagement with other graduate students. "Club Agrawal," as us members jokingly called it, provided a safe space to share early ideas of this project. It is the better for it. Bruce Mannheim gave me guidance and strength when I needed it most. Without him, I would not be writing these words today. Until his passing in August of 2011, I counted on the mentorship of Fernando Coronil. As co-chair and mentor, he was a critical and jovial interlocutor who taught me the essence of anthropology: to question categories.

I also want to thank Holly-Peters Golden, Larry Hirschfeld, Douglas Medin, Stuart Kirsch, Katherine Verdery, Julie Skurski, Tom Fricke, Peter Richardson, Frank Yates, and Eduardo Kohn for support and feedback along different stages of my graduate career. Laurie Marx's guidance as Graduate Coordinator and unwavering support as friend were critical during my years in the department. I made wonderful friends among other students while at Michigan. Special thanks to Susanne Unger, Junehui Ann, Jessica Robins, Cat Bolten, Xochitl Ruiz, Bridget Guarasci, Cecilia Tomori, Katherine Martineu, Emily McKee, Karen Herbert, Oana Matescu, Jill Constantino, Genese Sodikoff, Paolo Sosa, Nicola Knight, Crystal Fortwangler, Josh Reno, Michael Hathaway, and all of my friends of the now defunct Culture and Cognition Program. When I heard that one of my committee members accidentally had not received my thesis just a week prior to my defense, Jessica Robbins printed a copy and delivered it in person! Jessica also took wonderful notes throughout my defense's two hours of engaging conversation. Aixa Alemán, now an aspiring anthropology graduate student herself, has been an extraordinary friend and colleague who has inspired me with her tenacity. Her ideas helped this project (and its author) grow.

Working as a graduate student instructor with Holly Peters-Golden and Milford Wolpoff was an invaluable experience. Both in their own ways epitomize excellence in education. May I be as committed to my students in the future as they were with theirs. Holly and Milford were only the most recent of a long line of exceptional educators from whom I have learned so much along my journey in both North and South America. In Caracas, I was a student in two wonderful schools: Montecarmelo Elementary School and Washington Academy. To Rosa Cedeño, Kathy Tugendhat, and Freddy Yáñez, who

insisted in always looking at the other side of the coin, I extend a special thank you. In Trinidad, Colorado, my chemistry teacher James Cihura encouraged me to attend the Frontiers of Science Institute, an experience that first introduced me to the challenges and joys of research and a college education in the United States. During my undergraduate years, also at the University of Michigan, my participation in the Undergraduate Research Opportunity Program led to two extraordinary years working in Dr. Benedict Luchessi's cardio-pharmacology lab. I still remember him showing me the wonders of the heart's automaticity. I have strived to maintain that sense of wonder at learning new things and celebrating it in others (including the speleologists I feature in this project) ever since. Thank you to my undergraduate advisor, Marsha Pumroy, and my professors Randy Tessier and Michael Kennedy.

During my sophomore year at Michigan I was one of several scholars in the Minority International Research Training Program that Michigan's Center for Human Growth and Development has been coordinating since the early 1990s. With this program I participated in a bioanthropological study in Bolivia under the direction of Roberto Frisancho and Stephen Farrow. It was in the summer of 1995, deep in the Bolivian Yungas, that I fell in love with anthropology. I thank Roberto for his unwavering support, although he would have rather I stay in the biological side of the discipline. He warned me that bioanthropologists seek out connections between things, while their cultural counterparts do something much harder: they create new things. While not in total agreement with that view, I am quite happy I took the more creative path. I thank Stephen, for saving my life on that mountain in La Paz. Also in Bolivia I gained one of

my dearest friends, Gloria Wheatcroft, who has encouraged me along this and many other long journeys.

The Center for Human Growth and Development became a special home for me. Its director of many years, Betsy Lozoff, has been and remains an extraordinary mentor, friend, and inspiration on all matters of life. A warm thank you to this Center's faculty and staff for helping me gear up and make it through graduate school. Other units at the University of Michigan that deserve my recognition are the Women in Science and Engineering Program, the Sweetland Writing Center, and more recently the office of the Alliance for Graduate Education and the Professoriate.

I benefitted from a number of scholarships from the University of Michigan Rackham Graduate School: the Rackham Merit Fellowship (2001), several summer research awards, and a Rackham One Term Dissertation Fellowship as I wrapped up my writing (2011). This project also was funded by a scholarship from the National Speleological Society. The National Science Foundation funded my participation in the 2004 Summer Institute for Research Design in Cultural Anthropology, which helped me define my identity as a researcher, although perhaps not in the ways the program's excellent instructors intended.

During my writing, I have counted on the support and friendship of people at the University of Iowa: Angeliqe Dwyer, Emily Wentzell, Tina Ortiz, Tony Pomales, and Misha Quill have helped me feel connected to a university after leaving Ann Arbor in 2006.

I turn now to cavers that have kindly made me one of their own. A special thanks to Rane Curl, my cartography instructor Patricia Kambesis, and Iowa Grotto president

Mike Lace. In Venezuela, I thank all members of the Venezuelan Speleological Society, past and present, and their families. The memory of Juan Antonio Tronchoni encouraged me everyday of my research in Venezuela, and does still. Much of this work builds on the meticulous historical research of life-long SVE member and geologist Franco Urbani. He patiently answered many questions while I was writing. A special thank you to Franz Scaramelli, Francisco Herrera, Carlos Galán, Carlos Bordón, Carlos Tinoco, Maribel Ramos, Luz María Rodríguez, Miguel Angel Perera, Pedro Aso, Carlos Bosque, Omar Linares, Kay Tarble, Alejandro Reig, Bernardo Urbani, Neyla Medina, Tomás Straka, Horacio Biord, and Dylcia Caires. In Caripe, the Salazars opened their home to me, and soon, their hearts. Also from Caripe, I thank all of the guides and staff of Guácharo Cave, particularly Park Superintendent Buitriago and cave guides Govinda Galindo and Benito Rodríguez. To Arquímedes Velásquez of the Asociación Pueblo Chaima Caripe (Association Chaima People Caripe) I am grateful for his guidance on the ongoing political and cultural struggles of the Chaima indigenous community on northern Monagas. The support and friendships of Beatriz de Bellard and María Fernanda Tronchoni were critical to the success of this project. In both I found kindred spirits: all three of us are daughters enamored with the intertwined legacies of our speleological fathers.

At Venezuela's Instituto Nacional de Parques (National Institute of Parks), I want to thank Gustavo Jiménez for helping me with the necessary permits.

None of this, neither the dissertation nor all of the education that preceded it, would have been possible without my family. In Caracas, my uncle Juan Rubio and aunt Clotilde Pesquera cared for me as they would have their own daughter. My parents-in-

law Nancy and Carl Rader have been an overwhelming source of love and support on all matters of life since we first crossed paths back in 1994. Mike and Marilyn Agin offered key graduate school guidance and even cleaned after me (and my car!) on that fateful day when Thai food was not as fresh as it should have been. Thank you.

My dear parents Wilmer and Mirza Pérez and brothers Carlos Luis and Carlos Eduardo... Where to begin? I could not have dreamed of a more wonderful family. May we continue sharing many adventures together for many years to come.

I dedicate this dissertation to my husband Erik Paul and daughter Andrea Sofía. Erik has been a steadfast companion, even as my explorations have lead me to deep, dark, and unexpected places. He has gifted me with the strength and freedom to grow from my journeys and come home. Thank you, Sweet Love. I started to write in earnest once I learned I was pregnant. In a way, then, this document is little Andrea's twin sibling! Gracias, mi Chupis, por ser.

To learn about those enchanted geckos, read on...

Chapter 1

Introduction

In 1967, Oscar Garbisu and Wilmer Pérez spent a month inside Venezuela's Guácharo Cave (Fig. 1.1). Here they are in their underground campsite. Delicate cave formations drape the walls around them. Garbisu rests in a hammock while Pérez works on the scaled version of a map representing the passages they explored and surveyed earlier that day. The place appears flooded with light, but that is because of the photographer's flash that burned with blinding intensity for an instant. Once the eyes readjusted, Garbisu and Pérez only had the flickering light of the gas lamp to go by. Beyond its halo, darkness reigned.

Garbisu and Pérez set up camp for a month in Guácharo Cave to study the physiological effects of a prolonged stay underground. This was Pérez's idea. At the time, he was a medical student at the Universidad Central de Venezuela (Central University of Venezuela). Garbisu, still in high school, volunteered to be a fellow study subject. They also aimed to finish the survey of the cavern, a project that started in earnest in the early 1960s. They did this as part of the recently created Sociedad Venezolana de Espeleología (Venezuelan Speleological Society or SVE). This group was founded in 1967 and as of 2011 remains active although diminished in size and scope. It is dedicated to speleology, or cave science. Its mission has involved exploring anywhere in the country with potential for caves. Once located, caverns are surveyed and mapped.

The maps, along with detailed descriptions, are then published in a national cave registry in the group's yearly publication, the *Boletín de la Sociedad Venezolana de Espeleología* (the *Bulletin of the Venezuelan Speleological Society*). The registry, or cadastre, contains maps and descriptions of over 700 caverns. Once mapped, a cave becomes a space for further speleological research in geology, ecology, hydrology, biology, anthropology, and even, as Garbisu and Pérez would have it, physiology.

These kinds of activities, exploring, surveying, mapping, and creating registries of the resulting information, resemble geographical pursuits that have been key in the formation of empires and nations (Burnett 2000; Carter 1988; Edney 1999; Reig 2006/2007; Winichakul 1994). Maps representing a bounded territory have been critical in this process (Anderson 1991; Craib 2004; Dym and Offen 2011; Olwig 2002; Scott 1998). Geographic knowledge also has helped define and consolidate landmarks as icons of imperial or national identities (Burnett 2000; Carrera 2011; Harvey 2003; Johnson 1995; Radcliffe and Westwood 1996; Reig 2006/2007). In the case of nations, these iconic monuments or parks have been a critical stage upon which ideologies of a supposedly common cultural and natural heritage are crafted, consumed, and sometimes challenged (Harvey 2003; Johnson 1995; Levinson 1998; Ranger 1999; Radcliffe and Westwood 1996; Reig 2006/2007; Withers 2004). Imperial/national geographic projects developed alongside other practices such as botany, zoology, and mineral prospecting (Burnett 2000; Feeley-Harnik 2001; Mueggler 2005a, 2005b; Parrish 2006; Raffles 2002a; Schiebinger and Swan 2005). Scholars have pointed to the blurring of militaristic, economic, and scientific enterprises in imperial and national histories (e.g., Reig 2006/2007). These domains remain entangled today (e.g., Hayden 2003).

What might the quest for geographic knowledge look like at the margins of imperial and/or national projects? What forms might it take in practice? In this study I examine these questions in the context of speleology from historical and ethnographic perspectives. I focus on the Venezuelan Speleological Society, the group that sponsored the 1967 month-long expedition in Guácharo Cave. Based on ethnographic and archival research carried out between 2007 and 2008, I analyze the relations between science, sociality, and landscape. In the case of the Venezuelan Speleological Society, science, with a focus on geographic knowledge, takes the form of survey notes, cave maps, and descriptions that are catalogued in a national registry that the group administers and publishes in its journal. Thus, it is not the state that performs, directs, or even manages speleological research and data. Instead, it is a small group of civilians, mostly friends among them, many not even career scientists, who explore and map caves as an amateur pursuit. They do this in their free time, and mostly at their own expense. In doing so, SVE members appear to be doing the work of the state by revealing a hidden dimension of the national natural patrimony. But are they? What, how, and why is this group taking on this project? What do their activities and motivations suggest about geographic exploration and mapping beyond imperial and state-sponsored territorial pursuits?

For most members of the Venezuelan Speleological Society, cave science is primarily about experience and relatedness: The extraordinary experience of traveling to many regions of Venezuela and exploring and mapping its caves. Many were friends first and speleological partners later. Others forged intense bonds of friendship—even love—while practicing speleology together. As a group that emphasized cave science as a collective pursuit, the Venezuelan Speleological Society created a space for an alternative

science that is not state-directed, professional, hierarchical, nor individualistic. This does not mean that Venezuelan speleology has nothing to do with nation-making and territorial politics. It does. It just means that it is not the main story.¹ We must look elsewhere.

Let's return to Garbisu and Pérez deep in Guácharo Cave. Had we been there, we would have had to get nearer to see what they were doing. Moving in the cavern's irregular inner surface would have required much care. The lantern's limited reach would have demanded more intimacy. And silence. What might have we heard? At that moment their Beatles cassette tape was enjoying a much-needed rest. We might have heard the soft trace of the pencil on the drafting paper as Pérez worked on the cave survey. Casual conversation between the two was most likely about girlfriends and not about their contributions to Venezuela's speleological patrimony.² Garbisu had just broken up with his sweetheart. To make matters worse for him, Pérez could hardly contain his excitement about his new girlfriend, Mirza Pesquera, whom he met in medical school back in Caracas. He talked about her constantly. Garbisu teased him.

Pesquera convinced her family to travel to Caripe, Monagas, to pay a visit to her boyfriend during his 30-day underground stay. Along with her brother, sister, her

¹ It rarely is. Even in cases where geographical pursuits are part of imperial or state projects, experience—with the landscape, with other people, and even with the tools and technologies that make the work possible—always is an important part of the story of how scientific knowledge is produced. Arguing this point, a number of scholars caution against the assumption of empires and states as monolithic entities capable of structuring and dominating every form of engagement among humans and the landscape (Burnett 2000; Carter 1988; Edney 1999:25; Mueggler 2005a, 2005b; Raffles 2002a, 2002b). By focusing on activities on the ground, the quest for geographical and other forms of knowledge that have been deemed crucial in the articulation and imagination of imperial and state power turns out to be much more nuanced and complicated than one might first assume (Burnett 2000; Carter 1989; Edney 1999).

² This is based on Wilmer Pérez's recollection of this event (Pérez, Personal Communication, December 30, 2011).

boyfriend, and cave guide Benjamín Magallanes, she made the kilometer and a half trek through the mostly horizontal cavern to reach the subterranean camp. At one point she had to submerge herself almost completely in the cave's inner river to cross the infamous *Paso del Viento* (Wind Pass). During the dry season, the spot spares only a few centimeters of breathing room just under the passage's low ceiling. Meanwhile, Pérez was jumping with excitement, expecting her arrival to his camp at any minute.³ The cavern's caretaker, Ramón Salazar, had called the speleologists underground to inform them of the visitors' arrival. He used a phone line that connected his home just outside of the cave entrance with the camp. It was set up for the purpose of the 30-day mission. The phone was SVE president Juan Antonio Tronchoni's idea. Tronchoni, almost 20 years their senior, cared for the young explorers as if they were his kids. With the entry of more young members to the group, he soon gained the nickname "Papa Juan." Most SVE explorers that joined the Society during the 1970s and 1980s still remember him by that name.

Pesquera brought with her two cans of tropical fruits in syrup. Pérez didn't open them for several days after her departure because "she had touched them" (Pérez, Personal Communication, December 31, 2011). Garbisu, a Marxist (or a hungry and envious friend?), complained that he was fetishizing the cans.⁴ Desire to munch on the sweet treats eventually gave way. Recalling this episode, Pérez joked that had his girlfriend given him empty Coke bottles, he would have "placed them at the entrance of the cave next to lit candles!"

³ This is based on SVE member Fernando Enrech (Enrech, Interview, January 4, 2008). He was visiting the Guácharo Cave underground campsite to bring more supplies at the moment that the explorers got the call announcing the visitors' arrival.

⁴ Garbisu went on to study anthropology in the Universidad Central de Venezuela.

Fruit cans turned fetishes, a phone line connecting the two young men to the world beyond the cave, a Beatles tape, muddy boots, the flickering gas lamp, and that map...that representation in the making, the result of bodies moving in coordinated rhythm with their tools through the cavern's inner passages. The production of geographic knowledge—illustrating science in practice more generally—must be understood as part of these rhythms. These are rhythms not just of bodies and tools in and with place but of all things—both tangible and not—that make scientific practice possible, giving it meaning and nurturing into the future.

This project builds on studies that have emphasized the material, affective, and relational qualities of scientific pursuits, including those done in imperial contexts (Burnett 2000; Carter 1988; Mueggler 2005a, 2005b, 2011; Raffles 2002a). It then considers the implications of these perspectives on three questions that have received limited attention in the academic studies of science. First, what nurtures and sustains *over time* collaboration among diverse actors in a scientific pursuit? Second, what brings these diverse actors together in the first place? And third, what might push them apart? These are special problems for Venezuelan speleologists, who do cave science mostly as an amateur pursuit.⁵ As I have already noted, they do not get paid for what they do. They practice speleology in their free time. Thus, neither salary nor professional prestige appears to be the main motivators here. Moreover, what happens to the knowledge they produce? How does it become accepted and disseminated as scientific knowledge?

⁵ This is true of most speleologists around the world, although there are some exceptions. Moreover, the picture gets complicated in the case of speleologists who are professional scientists in fields such as geology or zoology. In these cases, there may be some overlap between speleology and their fields (see Chapter 3). See also Sarah Cant's analysis of British speleologists (2006).

On this last count we know the important role that norms and techniques, such as methods standardization, play in the simplification, translation, and objectification of knowledge (e.g., Latour 1989, 1999; Leigh Star and Greisemer 1999[1989]; Mol 2002). Attention to these norms and techniques, alongside the qualities of tools and products of standardization (e.g., files, measuring equipment, maps, graphs), helps us understand how diverse actors collaborate in a common pursuit while ensuring the integrity of their science (e.g., Leigh Star and Greisemer 1999[1989]). Interestingly, these studies show that all actors need not achieve consensus to get the work done. Moreover, the resulting knowledge does not even have to *be the same thing* to all people (Mol 2002)! We also know of the key role that morality plays in the judgment of this integrity (Shapin and Schaffer 1985; Shapin 1998, 1999[1988]). Not everyone can witness an experiment or a curious specimen in the field. How do we trust the integrity of scientific knowledge produced/collected elsewhere by others? On this point, the judgment of individuals' moral character is key (Shapin and Schaffer 1985). Even with the modern invention of signs of expertise (e.g., degrees, licenses, refereed journals, conflict of interest statements), trust plays a role, since we have to trust these markers of expertise (Shapin 1998:8).

In this project I emphasize the relational, affective, and experiential qualities of scientific practice. I argue that along with norms and trust, affect and experience (both the result of people's relations among themselves, to place, and to things) are important to understand the how and why of science. Moreover, they are important to understand people's *commitment* to each other and to science over time. This perspective gives us intriguing insights into why some collaborations work and others do not.

Something else happens when we focus on these relational, affective, and experiential qualities of scientific practice. Studying activity in spaces of science, whether laboratories or the field, is not enough. Doing so cuts off important relations that spill beyond these spaces that help sustain science in the first place. These relations—of kinship, of friendship—take us beyond the field and laboratories to basements, homes, and personal libraries where objects of science—such as tools, maps, specimens, and field notebooks—expose a broader, more intimate, and also more dynamic “geography of science” (Livingstone 2003).⁶ From this vantage point we better understand how and why people come together and maintain scientific endeavors. We also learn how these endeavors and the knowledge they produce become meaningful to people’s lives.

In my analysis the Venezuelan Speleological Society comes into being and is maintained over time by the moral and affective relations that speleologists have forged in and with the cave landscape, both above and below ground. Above ground, this landscape includes others spaces beyond the field site. Most of these places are real, such as the many buildings that the group rented before settling into the basement of a residential building, restaurants, and members’ homes. Some are imagined, such as the spaces that the group hoped it could create but never did, such as its own research laboratory, museum, and even a center near Guácharo Cave in Monagas State. Thus, this project proposes opening up the spaces of science by emphasizing their interconnectedness and even overlap with a broader geography of intimacy and

⁶ To David Livingstone, a geography of science examines “how scientific knowledge bears the imprint of its location” (2003:13). This examination is warranted because all dimensions of scientific practice, including the circulation of scientific knowledge, “have spatial dimensions” (2003:12). In my project I build on Livingstone’s proposition of the spatiality of science, but do so by questioning what we might assume to be spaces of *science* prior to an ethnographic investigation of a broader geography,

relatedness. By a geography of intimacy and relatedness I mean, simply, all of those spaces occupied and carved out by the rhythms and attachments of everyday life, of which, for many, scientific practice is a part.

In a broader sense, then, this is a story about the ways people create meaning, and strive to have that meaning endure. This is an unusual perspective from which to consider scientific practice. I argue, however, that it is a necessary and productive perspective since it opens up scientific practice as one of many ways in which humans strive to build relations among one another and explore the world. In anthropology we understand that this is about people thinking, saying, and doing things together in and with place (e.g., Feld and Basso 1996; Ingold 2000). We know a lot about these dynamics in the context of habitual practices. But we know less about how place becomes meaningful to people as they explore and experience *new* places in ways that are less predetermined. I think this is because even considering the possibility of “newness” might imply separation between humans and the world. And this separation, this estrangement, is what scholars who emphasize the “being-in-the-world” quality of human experience are arguing against (Csordas 1994; Gibson 1979; Ingold 2000:166-171; Feld and Basso 1996; Jackson 1996; Macpherson 2010; Merleau-Ponty 2005[1945]; Stoller 1995; Thrift 1996).

On another front, to speak of exploration and discovery ushers in a whole other set of tropes and stereotypes, such as imperial explorers who objectify and exploit nature, on the one hand, and tourists consuming a prepackaged experience, on the other (Pratt 1992; Vivanco and Gordon 2006).

In my work I propose other interpretations. To the Venezuelan speleologists, places become meaningful not only through the embodied and even poetic experience of

exploration and the collective efforts it entails, but also by using and making maps. With this I emphasize the affective qualities of scientific practice not only as emplaced but also as embodied in material artifacts that gain rich social lives beyond their specific identity and use *as* objects of science (Appadurai 1986; Mueggler 2005; Raffles 2002). This approach to maps and map-making is an important contribution to academic studies of cartographic practices (Cosgrove 1999). These studies typically focus on maps as either imperial or state technologies of power or as effective tools of resistance against imperial or state encroachment into the lives and spaces of disenfranchised communities (Anderson 1991; Craib 2004; Olwig 2002; Peluso 1995; Radcliffe and Westwood 1996; Scott 1998). Venezuelan speleological practice fits neither category, since it neither works for the state nor counters it with territorial claims over the spaces it explores and represents. In my study cave maps are representations of spaces/objects of science that highlight a hidden aspect of the national natural patrimony. But in practice, they are, above all, the material instantiation of a collective effort that honors particular affective and moral bonds of relatedness among people working together in and with place.

Even as I open up the geography of science to include other spaces beyond the laboratory or the field, I do not lose sight of the peculiar qualities of each. Indeed, understanding speleology is impossible without appreciating the characteristics of caves as sensuous, hidden, and ambivalent spaces that resist being revealed and bounded. Cave landscapes force a radical multidimensionality to our appreciation of space. Their exploration demands thinking of space along multiple planes, but also across time. This is true of any space (Massey 2005). Caves, however, bring this abstract notion to the forefront of human engagements in the world. One reason for this is that there is no

technology that can accurately map a cave from the surface. Even locating caves poses dire challenges to existing technologies. This remains true today, just as it did for Oscar and Wilmer in 1967. One must enter a cave to explore it, map it, and thus construct a representation of the enclosed space. This representation, in turn, enables the explorer to situate himself within what is often a maze of winding and overlapping passages. These practices grant an anachronistic second life to exploratory activities that scholars have dismissed as a thing of the past (Gordon 2006:1). This fact offers a unique opportunity for an ethnographic inquiry of exploratory and cartographic practices in the field.

Caves are distinctly polyvalent, charged with intense symbolic and material qualities that come into being as human bodies traverse their passages (Aitken 1986; Eliade 1962; Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990; Shortland 1994; Williams 2008). These are not spaces of dwelling or habitual practices, thus calling on theorizations of space that consider intense human encounters with unfamiliar and even disorienting places (Aitken 1986; Cant 2003; Ness 2011; Yusoff 2007). By considering caverns as spaces of exploration, as objects of science, this study broadens the range of human-cave relations (Bonsall and Tolan-Smith 1997a; Brady and Pruffer 2005a). In the context of Venezuela, this also means considering speleological activities alongside and in relation to other cultural (indigenous, folk) practices that center around caves (Perera 1988).

The Venezuelan Speleological Society is a scientific organization that is neither professional nor state-sponsored. This fact, along with its autonomy, makes it an exceptional in the case of Venezuelan science (Díaz, Texera, and Vessuri 1983; Vessuri 2005). Indeed, the SVE resembles the kinds of civic science societies that Withers and

Finnegan describe in the case of Scotland in the 19th century (2003). This is a novel perspective from which to examine Latin American science, which has focused primarily on individual personalities (typically although not exclusively on Europeanized elites), imperial projects of expansion, and religious and/or state efforts to promote republican modernist ideals (Cañizares-Esguerra 2005, 2006; Pratt 1992; Saldaña 2006).

The fact that speleological activities take place in Venezuela, with a focus on Venezuela's underground no less, begs the question of how they compare to what we already know of society and nature in Venezuela.⁷ We know of the key role that underground wealth has played in the consolidation of the modern state (Coronil 1997). Speleology, however, does not appear to reveal a parallel world of underground wealth. First, despite early efforts by some speleologists, the state has shown little interest in caves. Caves are "empty" in the eyes of those focused on the underground as a large-scale and undifferentiated source of mineral wealth. Second, even if we think of the speleologists as doing the work of the state by surveying caves, this does not translate into appropriation or exploitation of these spaces... or at least not yet. In my work I suggest ways this could change. Yet, I think that speleological practice points to unexplored ways citizens may reconfigure and even challenge state-orchestrated relations between nature and nation. Thus, this study presents an ethnographically grounded case of human experience, production, and imaginings of alternative national geographies, their histories, and futures.

⁷ As part of the nation's underground, caverns are national patrimony. In contrast to places like the United States, where a private owner's topsoil rights extend to the underground, in Venezuela they are only surface-deep (although there are complex legal exceptions in both cases).

Introducing Speleology

According to speleology historian Trevor Shaw, "the overlapping of the scientific fields of geomorphology, geology, biology, geography and exploration, together with history, and focusing them on caves best represents speleology" (Cant 2006:780; Shaw 1979).

Thus, it is most appropriate to think of speleology as the interdisciplinary scientific study of caves. This includes studying caves *themselves* as geomorphological spaces (their dimensions, their origins, etc.), what they *contain* (flora, fauna, minerals, archaeological artifacts, etc.), and their *connectedness* to the broader landscape (their hydrology, geology, etc.). *Karst* is the term attributed to such a landscape (Ford 2004). Basic to all speleological pursuits, then, is studying this landscape, and specifically, locating, exploring, and mapping caves. As I have already noted, there is no technology that can accurately map a cave from the surface. One must enter a cave to explore it, map it, and thus construct a representation of the enclosed space. This makes speleology a distinctly "sporting" scientific pursuit (Cant 2006).

The historical development of speleological knowledge parallels developments in cave exploration (Shaw 1979). This begins with the embrace of an epistemological stance grounded on first-hand experience: the idea that only through "direct" experience, by observing nature in its "natural state," does it truly and more fully reveal itself (Cant 2006:779; Hevly 1996; Secord 2002). French speleologist E.A. Martel (1859-1938), who is widely regarded by the international speleological community as a key promoter of the science, ardently espoused both aspects of speleology: the exploratory "sporting" and "scientific" sides (Cant 2006:779; Shaw 1979:61). For him, sports and science came together at the map (Chabert and Watson 1981:3).

Not only are the tools and techniques necessary to survey a cave relatively accessible, economical, and practicable (at least when compared to the technologies necessary to explore other geographical “frontiers” such as deep oceans and space), their accurate use depends on a team effort. This fact, combined with the appeal of cave exploration ranging from the explicitly scientific to the adventurous, typically results in a mixed group of practitioners. This diversity characterizes other field sciences (Kuklick and Kohler 1996). Moreover, speleology remains primarily an amateur science. Only very few states or academies promote speleological study as a professional and/or academic pursuit. Thus, most speleological societies and clubs are made up of a mix of career academics (typically geologists, biologists, archaeologists) and non-academics who practice speleology as a “serious hobby” (Stebbins 2007).

Human geographer Sarah Cant has examined the field and institutional dynamics of British speleology between the 1930s and 1950s (2006). She argues that the sporting aspect of speleological practice both contributes to the diversity of its practitioners and to tensions among them as they struggle to define the objectives as more or less scientific. Addressing precisely how this plays out in the context of Venezuelan science is one of this dissertation’s main tasks.

As is to be expected in communities of practices struggling to define its blurry boundaries, different terms arise to define different kinds of practice. The proliferation and use of terms also abides to cultural and historical contexts. Here I offer a brief contrast between the Venezuelan and U.S. cases.⁸ I will start with the case of Venezuela,

⁸ Although my dissertation fieldwork centered on Venezuela, much of my speleological training took place in the United States. I return to this point when I describe the project’s methods and scope.

or more specifically, the SVE, which, from its beginnings, has strived to define itself as a *scientific* society. Their embrace of the term *espeleología* (speleology) signals this stance. An *espeleólogo* contrasts to an *espeleista* (among SVE members, this is typically a derogatory term). *Espeleista* does not have an exact translation in English. Depending on context, it might translate into "spelunker," the term current U.S. cavers use to describe an individual who visits caves with very limited experience and often, disregard towards conservation. But *espeleista* can also translate into "sports caver," a genre of cave enthusiast that is experienced and skilled in exploratory techniques. Sports cavers focus on cave discovery and record-breaking, such as exploring the deepest or longest caves in the world. Such individuals still rely on cave surveys to find their way and claim their achievements (where they have been). Thus, many sports cavers are skilled surveyors themselves, or rely on those who possess those skills within their exploratory teams.

The term "speleologist" is less prevalent within the U.S. caving community. Most self-identify as "cavers." Still, there is much slippage among these terms and their meanings. This fact signals the diversity of activities that characterize speleology as a sporting-science (Brucker and Watson 1987; Cant 2006; Schaper 2003). In this dissertation I will use the terms "caver" and "cave explorer" interchangeably to describe people who explore caves. I have heard some Venezuelan cavers use the term *cuevero* (the literal Spanish translation of "caver"), but it is usually done so casually, not as a serious self-descriptor.

One of the key arenas in which the boundaries of speleological practice have been debated is how to properly survey and map caves. Interestingly (but hardly news to

historians and philosophers of science), how caves are defined has been a contested issue (see Curl 1964 for an early discussion of this). As Ukrainian speleologist Alexander Klimchouk notes, a cave's definition is necessarily

anthropocentric, [since it] relies on the ambiguous criterion of accessibility by man, has no genetic meaning, and is therefore non-scientific. It also implies that a cavity is connected to the surface through entrances. Caves can be distinguished from surface landforms by morphometric criteria: caves are forms in which the long dimension (length or depth) is greater than the cross-sectional dimensions at the entrance. The anthropocentrism of the above definition of a cave implies that it is largely air-filled, but advances in underwater cave exploration during the second half of the 20th century have dramatically relaxed this limitation. The concept of a cave, is, rather, an exploration notion. [2004:203]

Less interested in static categorizations of what caves are or are not and what a speleologist is or is not, I prefer to think of caves and explorers as mutually constituting in practice. This means thinking of each as process or "event" (Massey 2005; Rose 2002). In this view,

[L]andscape is no longer understood as simply being an inert background or setting for human action, nor is it understood as solely a pictorial or discursive form of representation. Rather, landscape ... comes into being by drawing variably on embodied, material and discursive domains. [Macpherson 2010:6]

Within various caving communities around the world, debates have and continue to rage regarding proper ethics of exploration, debates that further challenge a cave's "naturalness." When is it "proper," if ever, to physically enlarge a cave entrance or passage to permit further exploration?⁹ What about abandoned mines that take on the ecological properties of "natural" caves such as when they become colonized by bats?

⁹ The relevance of this particular issue varies across caving cultures, and across time. I have not been able to confirm any cases within the history of the Venezuelan Speleological Society in which this was ever an issue. In the United States, however, the rise in incidences where caves are artificially altered to allow for further exploration is a growing concern.

Should they not be explored and surveyed as well? Must caves be counted only when they are the result of the process of dissolution in limestone rock, as opposed to, for example, caves formed from mechanical processes such as rock breakdown? This dissertation analyses, both from a historical and ethnographic perspective, how variously positioned actors, speleologists and non-speleologists alike, have addressed these questions, both discursively and in practice. This dissertation's central contention is that relevant discourses and practices must be considered dialectically as they relate to human engagements with the peculiarities of the cave landscape while at the same time not cutting caves off from a broader geography of science.

A Brief History of Speleology

The term *Höhlenkunde* is the first to refer to a consolidated field of cave study of science. It first appeared in an 1850 paper presented to a learned society in Vienna, and is still used in German today (Shaw 1979:2). The coining of "speleology" is attributed to prehistorian Emile Rivière. E. A. Martel used the word and first presented it in a paper at a meeting of the Association Francaise pour l'Avancement des Sciences in 1894 (1979:2).¹⁰

¹⁰ The question of how and why caves should exist at all, however, has intrigued humans well before the formalization of speleology or even geology as a discipline (Shaw 1979, 2000). Some explanations included the belief that they were man-made or that they resulted from the expansion of gases from decomposing animals that died in the Biblical Floods. Catastrophists extended to caves the same thesis they applied to other landforms: violent tectonic movements of the Earth's crust shaped the contours of the planet, both above and below the surface. The effects of water eroding, enlarging, and shaping fractures in the bedrock remained central to uniformitarian explanations. In contrast to the catastrophists, however, they allowed a longer timeframe for water currents to cause these transformations (Shaw 2000:22-23). It was not until the end of the 19th century that the impact of water as agent not just of erosion but also of *dissolution* was acknowledged.

Before the formalization of speleology in the late 19th century as a recognized scientific pursuit, caves already played an important role as places of science (Shaw 1979; 2004). This is due to their quality as valuable repositories of well-preserved clues to the past. Archaeology originated from the systematic study of remains found in European caves during the mid 19th century (Shaw 1979:345). In many cases, these remains were critical in the dramatic debates regarding understandings of the past (Rudwick 1989:243-245; Shaw 1979:362).¹¹

The study of cave art also stirred passionate debates regarding their symbolism and impact on understanding of human antiquity. By the end of the 19th century, a growing number of accounts of paleolithic cave art garnered enough acceptance and interest to propel their study, first in Europe, but then elsewhere, in every continent except Antarctica (Bednarik 2004:85).¹² Interestingly, much of this imagery is located

Shaw attributes this to “more detailed and more precise examination of caves at the time” (2000:23). In fact, most caves in the world are primarily the result of the more or less steady process of dissolution of (usually, but not exclusively) limestone by acidic water. A precise understanding of this mechanism was not achieved well after oxygen was discovered in the 1780s.¹⁰ In 1830, two scholars independently published statements on the role of carbon dioxide in cave formation, Charles Lyell and Charles Edouard Thirria. Thirria, who was a mining engineer, also explored and surveyed many caverns in his native France. He encountered underground features (stalagmites and stalactites) that could not be explained any way other than by the dissolutive power of acidic water (Shaw 2000:26).

¹¹ For example, for Georges Cuvier (1769-1832), materials derived from caves formed the basis of his formulations of comparative anatomy (Shaw 1979:362). The excavation of flint tools, together with the bones of extinct species from Brixham Cave in Devon, England, precipitated Charles Lyell's rethinking of geological time in favor of a lengthened geological chronology (Trautmann 382:1992).

¹² Explanatory paradigms have gone through a number of shifts in the discipline's history, with the view of simple and primitive art forms moving towards more complex ones dominating the field well into the 1990s. In 1995, archaeologist Robert Bednarik refuted this linear evolutionary framework with his work in Chauvert Cave in France. Direct dating techniques proved that in this site, the most sophisticated imagery preceded the simpler forms (Bednarik 1995).

well beyond shallow rock outcrops and cave entrances. These cases have prompted a consideration (often speculative) of why humans delved deep into caverns (Bahn 2004). As I will highlight further on, incorporation of cave specialists in the study of cave archaeology dramatically expanded and strengthened these analyses and interpretations (Brady and Prufer 2005a).

The appreciation of caves as natural laboratories also preceded the formalization of cave science, or speleology. Charles Darwin (1809-1882) pointed to the special adaptation of cave fauna to their relatively stable environments as important evidence of evolution (Shaw 1979:345). More recently, climate scientists have been studying stalagmite core samples in an effort to reconstruct the earth's climatic history. Deep caves also have yielded "extremophiles," organisms (mostly microbes) that survive in extreme environments inhospitable to humans (Taylor 1999:16).

Since the early 1600s, interest in mineral resources, waste management, and water sources promoted systematic regional exploration of caves, particularly in Eastern Europe, where so much of the landscape is karst (Shaw 1979:19). One of the common characteristics of karst landscapes is that much of the fresh water resource is underground, since the porous earth cannot hold it on the surface. This is a challenge for underground miners keen on keeping their shafts from flooding. Finding nearby caverns also "solves" the problem of dumping waste (this "solution" often results in the contamination of fresh water sources). Thus, karst landscapes pose unique challenges to those eager to channel water or build dams (Shaw 1979:31). Other utilitarian uses that fueled the exploration of cave systems included the exploitation of a unique resource contained therein (such as the nitrate-rich bat guano used to produce gunpowder and

fertilizers) and the development of caves for tourism (Hamilton-Smith 2004; Shaw 1979:365).¹³

The success of geological and hydrological reconnaissance efforts depended on situating caverns in relation to the broader landscape. Caves had to be accurately described and mapped. This required a systematic exploration in the field and the consolidation of speleological knowledge of a region. Czech (then Bohemian) Adolf Schmidl (1802-1863), who carried out the majority of his research in the karst region of Postojna Cave in Slovenia, Austria, and Hungary, was the first to conceive of cave studies as a unified area (Shaw 1978:253). Among his key contributions were his emphasis on a regional cadastral project, his use of cave maps (made by his companion Ivan Rudolf, who was a mining engineer) superimposed on a surface relief map, and his general attitude towards underground exploration that led him to discover extensive underground systems (Shaw 1978; 1979). In other words, he was both a scientist and a sportsman.

Édouard Alfred Martel (1859-1938) also was key in the development of speleology. A lawyer by training, his enthusiasm for nature and science, his extensive travels both in Europe and in North America, and his initiative in founding speleological societies and spurring the production and circulation of speleological publications earn him the descriptor of the “founder of international speleology” (Shaw 1979:385). He emphasized speleology as a “sporting-science,” and hoped that its adventurous quality would attract many (Cant 2006: 775; Chabert and Watson 1981; Shaw 1979).

¹³ There are many other intriguing cases of utilitarian cave use. Caves in Indonesia and Malaysia were exploited for the valued edible nests of their bird in residence (Shaw 1972:72). Even earlier still, some indigenous communities trekked into caves to scrape minerals off the walls that they used as nutritional supplements (Watson 1974).

The appearance of exploration societies was fundamental for the further development of speleology. Their appearance followed closely the popularization of scientific societies and the growth of tourism in 19th century Europe, particularly England. While some short-lived groups originated in Switzerland in the early 1860s, speleology groups have existed continuously since 1879 (Shaw 1979:380).¹⁴ To Shaw, these societies were critical for three reasons:

They bring together people with similar interests, stimulating deeper and longer-term involvement in the field; By working together as a group, the members are able to undertake explorations that are technically more difficult and physically more demanding than those they could have done alone; Their specialist cave publications not only increase the amount of speleological material publish, but make it more readily available to people who have an immediate interest in it. [Shaw 1979:380; 2004:350]

Since the early 20th century, the number of speleological groups has grown dramatically. Many of them are devoted primarily to the sporting aspects of caving. Many others embrace cave science, thus promoting an agenda of exploration, surveying, and speleological study of karst phenomena. Interestingly, “the motivated and progressive societies that achieve research results, both in exploration and cave study, are still similar in nature to those of 100 years” (Shaw 2004:350). National and international bodies have sprung up, bringing together speleologist from across the world. In 1941, the National Speleological Society was founded in the United States, and it is now the umbrella organization of more than 250 caving clubs, or “grottos.” In 1965, the International Union of Speleology (UIS) was founded, and has since held international congresses every four years in every continent except Africa and Antarctica.

¹⁴ Martel founded in 1895 one of the most influential in world speleology: the French Société de Spéléologie. Its publication, *Spelunca*, has been in production and circulation almost continuously since then.

Representatives of speleological groups from the Caribbean and Latin America came together to form the Federación Espeleológica de América Latina y el Caribe or FEALC (the Speleological Federation of Latin America and the Caribbean) in 1983.

In Latin America and the Caribbean, the scientific and cartographic investigation of caves began prior to the institutionalization of speleological practice in the form of societies and expedition clubs, beginning in the 1930s in Mexico, Cuba, and Brazil. Interest in resource use and extraction often preceded and/or spurred such investigation. Extraction of nitrate-rich bat guano for gunpowder production from caves was an important activity in some areas of the limestone-rich Caribbean basin and in Brazil during the colonial period and beyond (in Brazil it went on into the 20th century) (Auler 2004:60). In Venezuela, the chemist Vicente Marcano explored many caves in the recently independent nation during the 19th century. The search and possible commercialization of bat guano for fertilizer was an important driver (Urbani 1984). Marcano is one of several key figures in the development of speleology in the region (Auler 2004).

Alexander Humboldt and Aimé Bonpland visited Venezuela's Guácharo Cave in 1799. They explored 422 meters of the cavern, which Humboldt later described in his popular publications following his travels (Humboldt (1966[1817]); Urbani 1999).¹⁵ From 1834 to 1844 Danish naturalist Peter Wilhelm Lund and the Norwegian Peter Andreas Brandt explored many caves in Brazil's Minas Gerais state in search for fossil bones. Brandt surveyed many of these caves (Auler 2004:59). In 1851, Father Romualdo

¹⁵ Chapter 2 offers a more detailed history of exploration of this cave.

Cuervo descended in a basket the 120 m vertical shaft of Colombia's Hoyo del Aire (Auler 2004:60).

In Venezuela, the practice of organized speleology began in 1952, with the founding of the Speleology Section of the Venezuelan Society of Natural Sciences. This group would go on to form the independent and autonomous Venezuelan Speleological Society in 1967. The group remains active to this day.

A few notes about this very brief history of speleology: In general, speleology remains a relatively marginal science. This is true in two senses: It is a field activity that takes place, literally, in a geographical frontier, in geological spaces that often humans have never entered. Moreover, caves' typically hidden, inaccessible, and sometimes inhospitable qualities generally preclude them from being highly recognized and valued landscape features. Only a few countries in the world have government-sponsored programs dedicated to the exploration, survey, and/or conservation of their karst resources (Australia, some European countries, Brazil, Cuba, and to a more limited extent the United States are exceptions to this). Even in these cases, the task of exploration, survey, and even management of nation-wide cave registries (if they exist) often is the domain of civic and autonomous groups, themselves rarely having any affiliation with academic institutions.

This goes hand in hand with the second sense in which speleology is a marginal science: In general, speleology has not achieved the institutional stature of other established academic disciplines such as archaeology, geology, or biology. While explaining the precise reasons for this requires broad research and analysis beyond the scope of this work, I will address the topic in the case of Venezuela throughout this work.

Finally, a “brief summary of speleological history” belies the fact that there are many speleological histories. Indeed, emphasizing “key players,” “important caves,” “the first and oldest and most accurate maps” reaffirms or echoes patriotic and even colonial narratives of scientific development and exploratory prowess. Critical scholars have given us good reason to question stories that present “science” (or capitalism, romanticism, nationalism, etc.) as originating in Europe and then “spreading” to the rest of the world (e.g., Anderson 1991; Cañizares-Esguerra 2006; Mintz 1985; Ortiz 2001[1940]; Wolf 1982). While “de-centering” the history of world speleology is beyond the scope of this project, I trust my analysis of the Venezuelan case will help shift perspectives, both below and above ground.

Broadening the Historical and Cultural Examination of Human-Cave Relations

Of course, the story of speleology is not just a story about science in and of caves. This is one of the key points I make in the case of Venezuela. It is also the lesson learned as we take a broader and deeper view of history. As sites of refuge, ritual, art, and exploration, caves hold a special place in human history and culture (e.g., Bonsall and Tolan-Smith 1997). Their uses and meanings have been and remain multiple, challenging typologies that attempt to characterize such uses and meanings. Only recently speleologists have transformed caves into objects and places of scientific study (although, as I will argue throughout my work, this transformation does not necessarily displace other powerful “non-scientific” experiences and meanings of place). An appreciation of this last transformation requires placing it in a broader historical and cultural context of human-cave relations.

A number of scholars (some speleologists among them) have put forth typologies of human-cave relations. These typologies have included both “utilitarian” and “non-utilitarian” uses of caves (Bonsall and Tolan-Smith 1997; Thompson 1959).¹⁶ Yet, archaeological attention to caves as important features of indigenous cosmology was, until recently, very limited (Brady and Prufer 2005b). When it did appear, functional assumptions dominated interpretations, with habitation as the most common conclusion.¹⁷ Within U.S. archaeology, important paradigmatic shifts of how human-cave relations were studied and understood occurred among Maya archaeologists since the 1960s (Brady and Prufer 2005b). Appreciating caverns not simply as backdrops or concepts but as complex phenomena integrated to the broader physical and ideational landscape was critical for these shifts to occur (e.g., Heyden 1975; MacLeod and Puleston 1978; Pohl and Pohl 1983; Thompson 1959; Brady and Prufer 2005b). How did this happen? By getting into caves and involving cavers and speleologists in the process of field research (Brady and Prufer 2005b:6). This marks a key break from “earlier interpretative work, [characterized by] writers using folklore, iconography, ethnohistory, and ethnography [which] tended to deal with the concept of the cave rather than with any physical reality” (Brady and Prufer 2005b:7). It also underscores a critical underlying theme of this present

¹⁶ Among the only volumes to treat the subject in a cross-cultural and comparative manner is Clive Bonsall and Christopher Tolan-Smith’s *The Human Use of Caves* (1997). Its 28 contributors not only acknowledge the relevance of caves in human history and culture (something others had done before), but go beyond most previous investigations to ask: “‘What were humans doing in a cave in the first place?’” In other words, they focus on human engagements with and in caves, instead of just treating them as backdrops to their activities, or even symbolic spaces in an ideational landscape.

¹⁷ According to Brady and Prufer, habitational and utilitarian interpretations of human cave use dominated the archaeological literature well into the 1990s (2005b:3).

project: the need to treat caverns not as context or backdrop but as active players in the making of place, the production of knowledge, and the forging of sociality.

Just as the involvement of cave specialists has greatly enriched research in Mesoamerican cave archaeology, comparative knowledge and expertise of cave space garnered through extensive fieldwork informs some of the most interesting and imaginative scholarship on cave art. As Clayton Eshleman argues in *Juniper Fuse* (2003), his exploration of the meaning of Upper Paleolithic cave imagery, theoretical attempts to explain *cave* art ought to consider the *experiential* character of caves. This requires, as Brady and Pruffer also argue, moving from a treatment of caves as concept to physical reality (2005b:7). But with Eshleman, treating caves as “physical reality” falls short of the complex dynamics that characterize cave landscapes. Encounters with/in caves are not just about encounters with stone. Movement within underground passages, assuming the explorer has a light source, involves shifting patterns of light and darkness. Shadows texture visual perceptions of place. Sound (or the lack thereof) also charge cave encounters in ways that threaten (and often succeed) to overwhelm the senses and excite the imagination. In other words, to think of caves as a “physical reality” requires considering the layered qualities of stone, lightscapes, soundscapes, and even imagined topographies, as they are encountered, in movement, by the prodding body (Bille and Sørensen 2007; Helmreich 2007). This “reality” comes into being by grasping moving bodies in and with space, bodies that don’t just move, but, like Garbisu and Pérez, think, dream, and even love.

Human-Cave Relations in Venezuela

Venezuelan Miguel Angel Perera, who first approached the Venezuelan speleologists right before the formation of the SVE in 1967, began to study human cave use during outings with his caving companions when he was a teenager. Perera is credited for establishing the nation-wide systematic study of past and present human cave use (Scaramelli and Urbani 2006). In 1988, he published in the *Boletín de la Sociedad Venezolana de Espeleología* an article that summarized twenty years of labor towards what he called “historical speleology,” as opposed to the often used terms “prehistoric speleology” or “speleoarchaeology” (Perera 1988:18). In this article he argues that “historical speleology” better includes the breadth of past and present human cave use in Venezuela, arguing for a theoretical framework that rejected a categorical break between past and present. He summarized that breadth thus:

(a) Caves and rock shelters with cultural material remains of precolombian amerindian groups of different epochs. In essence, that which is specifically speleoarchaeological. (b) Amerindian groups that continue to use caves for purposes similar to those of their ancestors and other ethnic groups currently nonexistent; representing authentic cultural relics, sometimes featuring evidence of cultural syncretism. (c) Isolated creole groups, peasants of strong indigenous [*riagambre*], that use caves for religious means during old traditional rituals or for periodic capture of their particular animal resources. (d) The cult which important urban and rural sectors of the population, mainly in the center of the country, have for María Lionza o María la Onza, popular deity and expression of a dynamic cultural amalgam in which caves, as sacred spaces, play a significant role. [Perera 1988:18]

Perera describes the relevance of caves as sacred and mythical space, as site for burial and ritual activity, as well as utilitarian use. He then shifts to a review of human cave use in Venezuela, highlighting its geographical distribution among the various karst regions of the country. He highlights the Turas cult in the states of Yaracuy, Lara, and Guárico, where believers of the Maria Lionza cult gather. Indigenous communities such

as the Wayu, Barí, and Yupka of western Venezuela, and the Wotuba, Mapoyo, and Hiwi of southern Venezuela have in the past and in some cases still use caves for burial purposes. SVE members interested in archaeology and history, several of them becoming professional archaeologists and anthropologists, gathered archaeological and ethnographic information from cave sites, their surveys also added to the National Speleological Cadastre (Perera 1988; Scaramelli and Urbani 2006; Scaramelli and Tarble 2000). Perera's historical speleological framework that seeks out past and present continuities allows him to note, for example, the fact that despite the impact of the European presence on indigenous communities, many caverns (47% of those listed in the review) continue to be sites of significant indigenous activity (Perera 1988:23). The present project builds on Perera's proposal of a historical speleology that seeks to integrate into an anthropological vision a broader scope of human-cave relations. Considering the activities of cavers and speleologists within that scope, this research aims to expand its range even further. Yet, it does so by "opening up" caves as it seeks their interconnections with others spaces of human practice and meaning.¹⁸

¹⁸ Caves are but one kind of feature of a very diverse and symbolically charged underground landscape. In her study of the human symbolic and material construction of the underworld, Rosalind Williams argues that the underground has been a critical stage upon which technological frontiers have been constructed and/or imagined (2008). Her review of European science fiction since the nineteenth century presents the underground as space of both spiritual and cultural revival and decadence and decrepitude. In either case, the relation between technology and humanity is at the core of the moral dilemmas countless writers have tried to present in their novels. The underground also has been a critical space where a broad range of social outcasts and undesirables have been able to outsmart dominant powers and even rebuild their communities and lives with some semblance to the normal rhythms of "surface" life (examples abound, from Christian catacombs and cities to war bunkers to the tunnels that Palestinians currently rely for the supply of goods, including arms). The subsoil also has been and remains a rich and contested domain of wealth to be either found or extracted. Tales of treasures deep within underground passages are common everywhere, often to the detriment of caverns'

Study History and Methods

In 2002, I joined the Venezuelan Speleological Society in a caving expedition to the region of Mata de Mango in Venezuela's El Guácharo National Park. I was so impacted by this experience—hiking through the jungle in search for caves, the sensation of entering a dark void not knowing where it might lead, the process by which surveyors represented the cave in their water-resistant field books, the almost obsessive dedication of a group of volunteers that had been part of this 40 year-old organization—that I decided to make it the focus of my dissertation research. At first, I centered my investigations on Guácharo Cave and the greater national park, but during my fieldwork my interests broadened to include the SVE's own ambitions: to explore, survey, and

conservation. In his ethnography *The Devil's Book of Culture*, Feinberg describes how the Mazatec community of San Agustín in Mexico's Sierra Mazateca remained both suspicious and perplexed with U.S. cavers' exploration of the regions' caves (2003: Chapter 7). Why else go into caverns if not to find something valuable, like a treasure? The belief that evil forces lurk in the cave's depth is widespread. A trip to a cave might suggest a person's devilish dealings, such as selling one's soul in exchange for riches to come. Social research also has focused on mining as a critical site where competing visions of nature, labor, wealth, modernity, and nation have been forged. Anthropologists and sociologists who have focused on mining practices, especially underground, have emphasized how the particular conditions of work—such as the constant risks, the need for collective coordination, the material and symbolic engagements with underground veins of wealth—contributes to an intense collective identity and even class consciousness (Ballard and Banks 2003; Godoy 1985; Ferry 2005; Lynch 2002; Nash 1993[1979]; Taussig 1980). In contrast to the underground as theaters of technological futures, or spaces of indiscriminate extraction of wealth, caves have been valued as spaces of adventure, escape, even solitude. Building on Williamson (2008), Michael Shortland presents caves as the stages of the sublime *par excellence*: "The sublime excites impressions that are not only powerful but, more importantly, contradictory and distorted. And nowhere, it seems, were such sensations produced more readily than in a cave" (1994:13). Thinking of caves within a broader context of underground spaces and frontiers, helps guard against pegging any one "kind" of space into static categories. The dichotomies of nature/culture, modern/primitive, sacred/profane are unstable are just as unstable below ground as they are "on the surface." Even this division of below and above must be questioned.

catalogue caves all over Venezuela. How did this project come into being? What motivates such efforts at a national scale?

I approached these questions from three angles. The first involved participant observation in all of the SVE's activities: exploration planning, participating in explorations, field training sessions, the drafting of reports, and the preparation and production of the group's publication, which features the cadastre. Most of this took place between May 2007 and June 2008. Before this, in 2004, I participated in an SVE expedition to Roraima plateau, where an extraordinary cave system was in the process of being explored and surveyed. It was at the time that I first had the experience of surveying "virgin" passage—sectors of the cavern that, to anybody's knowledge, may have never been explored by anyone before us.

As a participant observer I had to overcome the challenge of doing ethnography *in* a cave. Caves are very irregular and dark places, except for the reach and intensity of explorers' light, including my own. There usually is no comfortable or even viable vantage point from which to observe a team of cave explorers do their work. To best understand and appreciate the dynamics of survey work I had to learn to survey myself. This made me part of the team. An important result of this kind of ethnographic engagement was my own *experience*, not just in caves but beyond them. In my effort to become part of the group, a broader geography of science was revealed.

Fieldwork also involved "reading" the cadastre in the field. Here I tried to use its information to navigate the karst landscape and find and explore a cave already surveyed. This leads me to the second angle of my research approach: my acquaintance and analysis of texts in the form of published journals, cadastral entries (written descriptions

and maps), correspondence, and minutes of over 45 years of weekly meetings. Much of the perusing, reading, and rereading of all of this material was done during the long process of writing, which sometimes took on the qualities of cave exploration itself!

Although the National Speleological Cadastre contains over 700 caves, during my fieldwork I visited 14 caves in the country (Alfredo Jahn and Walter Dupouy caves in Miranda state, Sistema Roraima Sur in Bolivar state, and 11 caverns in Monagas states). Of these, 6 of the Monagas caverns had not been surveyed and perhaps only partially explored (if at all). Moreover, since most of these 6 caves required technical climbing expertise, my entry, if at all possible, was only partial. Guácharo Cave is among the other Monagas caverns that I visited. Given my original study emphasis, I lived in Caripe with a family of cave guides for four months and interviewed several members of this vibrant community. I accompanied many tourist trips into Guácharo Cave. In March 2008 I finally visited the non-touristic sector of the cavern, which included the site where Garbisu and Pérez set up camp for 30 days in 1967.

Finally, interviews with past and present SVE members make up the third main component of my research. I carried out semi-structured interviews with 30 individuals, several involving extensive follow-ups. The question of how representative these 30 individuals are of the rest of the group has no straight-forward answer. I sought out as many past and present members with a range of perspectives on the group throughout time.¹⁹ From these interviews I got recommendations of others I should contact. I must

¹⁹ My analysis lacks a focused analysis of gender. This in no way means that gender has not been an important variable in understanding the history and sociology of the SVE. Indeed, I conducted a few interviews with women who were part of the group, as well as the wives and daughters of several members. However, I could not locate some key women who were active participants during the 1980s and 1990s. Lacking their

stress, however, that we are dealing with a relatively small group. The attendance at weekly meetings throughout its 40 years typically ranged from 10 to 20 members, sometimes less, sometimes more. Of these, those that could be considered “active” were 10 or less (the yearly membership listing that appears published in the group’s journal tends to overestimate the “active” membership). Society members use this term among themselves to describe those committed to the ongoing activities of the group. These activities include planning and participating in expeditions and contributing in some way or other to the publication of the *Boletín* (some years, the job of making sure the publication came together was taken up by 5 individuals or less).

The main questions that guided the semi-structured interviews involved how informants became interested in caves, what their role and experience was as members of the SVE, and what they see as the future of Venezuelan speleology. Of these interviewees, 10 of them have answered repeated questions and discussed the arguments I present in this work as I developed them. Wilmer Pérez has been critical mentor and reader of all of my work along the way. In a very real way, this project has been the result of a conversation with those I purportedly “studied,” an ideal I have strived for since reading Gudeman and Rivera’s work on domestic economy in rural Colombia (Gudeman and Rivera 1990).²⁰

perspective, I felt I had too partial a picture of gender dynamics in the group. Another reason for my pragmatic decision to obviate any gender analysis is that it did not seem relevant for many of the topics I *do* focus on, such as the process of exploration and map-making, internal debates within the SVE regarding the science vs. exploration duality, producing and reading the cadastre, and addressing the greater geopolitics of speleology.

²⁰ A note on names. Throughout this project I use people’s real names, since most have had their contributions to speleology published in the SVE’s journal. In cases where some information was shared with me in confidence, anonymity is respected (and noted).

Aside from SVE past and present members, I also sought out other individuals who had been involved, in some way or other, with cave exploration or conservation. While the SVE is the longest-running cave group in the country, it is not the only one. However, of the others that are currently “active” (and precisely what this means requires further discussion), two of them are university clubs. The other is a revived version of the earlier Speleology Section of the Venezuelan Society of Natural Sciences. In my work I include perspectives of these non-SVE affiliated individuals, but my focus remains on the Society. I also sought out family members of deceased speleologists deemed within the community as critical actors (namely Eugenio de Bellard Pietri and Juan Antonio Tronchoni). The perspectives of government officials, part of the National Institute of Parks, also inform this work.

Just as my friends joined intense language programs to learn the language they would use in the field, I headed to Kentucky to learn about speleology. I took four cave-related summer courses at Mammoth Cave National Park through Western Kentucky University's Center for Cave and Karst Studies (the courses were on cave geology, cave biology, cartography and mapping, and the history of exploration of Mammoth Cave). Aside from a thorough theoretical and hands-on introduction to speleology, I became enthralled with the complex history of property disputes that have marked the area, a history that is filled with exploration, intrigue, political meddling, legal challenges, and above all, a meandering cave system that would not cease to "grow" as cavers pushed passages. More recently, my perspective as ethnographer and experience as caver has further grown as a member of the Iowa Grotto. Its members have exposed my husband and I to an extraordinarily varied landscape and history in this state that is now our home.

Finally, I have a very personal connection to this project. This connection and the sensibilities that it affords are woven into the very arguments I put forth. Indeed, they made this project possible. I was born in 1975 to Wilmer Pérez and Mirza Pesquera, the same couple that united during that unexpected visit deep in Guácharo Cave in 1967.²¹ My father still recalls my mother's brave cave visit with excitement and admiration. When they married in 1972, they had their wedding party in Juan Antonio Tronchoni's home. Tronchoni, in turn, became my godfather, a relationship built not on religious ties but on speleological ones.

I first learned about caves and speleology not through geography or geology courses or books or even the SVE journals in my home in Caracas. I learned about caves and speleology through my own random and exciting exploration of a number of leather-bound field notebooks that my father used to jot down his survey notes and cave sketches. As a toddler I scribbled the pages of a good number of them. Bats were common motifs in my childhood drawings. Other strange objects filled my home: bats and snakes soaking in alcohol in tightly sealed jars; helmets, boots, climbing ropes, and sleeping bags, all still with some dirt, and that wonderful musty smell; map drafting rulers, protractors, and pencils... My father took me to SVE meetings throughout my childhood as well. He gave me my first formal instruction on cave formation in the 6th grade, when I decided to be a speleologist for my class career day. In my station in the school's patio, I wore his helmet and carbide lamp with pride.

²¹ Some Guácharo Cave guides joked that I might have been conceived in the cave. "There's a room for that, you know," one told me. "It is the *Cuarto de los Enamorados* (the Lovers' Room), right off the cavern's first main gallery!" I corrected them with regret, following their joke, noting that the years just didn't add up. And yet, in a sense, my guide friends are not too far off the way things turned out.

Doing the research for this project, then, was in part a personal quest to revive, uncover, and at times create new bonds of relatedness. Archives, maps, and field notes were not just artifacts to study and analyze as objects of science but to love and cherish as mementos, even heirlooms. I soon recognized these same sensibilities in speleologists themselves as they handled their exploration gear, their personal copies of SVE journals, and their maps. From this perspective, exploring caverns was about encountering newness and all of the excitement and fantasies that that entailed. At the same time, it was about expanding and cementing the spatial reach of love, camaraderie, and friendship that bound many of the Society's members together. In a sense, caves reflect and nurture this duality: they are new and mysterious and homey and intimate at the same time. It is with the intertwining of these dynamics that geographic knowledge was forged, and in the process, the hopes of a science built on alternative relations among nature, nation, and history.

Chapter Summaries

Chapter 2 takes us to Guácharo Cave, the place where so many stories coalesce: stories of Venezuela's natural history, of speleology, of the Venezuelan Speleological Society, and even, as I have already described, my own. I develop a natural history in which guácharo birds, indigenous Chaimas, Catholic missionaries, European naturalists, state officials, and Venezuelan speleologists struggle—sometimes against each other—to define a space that defies definition (Raffles 2002:7). This struggle is revealed as different actors attempt to explore, to varying degrees of success and approaches, the cavern's passages. In the case of the Venezuelan speleologists, their efforts not only furthered the cave's

survey, they also reconfigured Venezuelan speleological knowledge and practice. As I argue throughout, explaining the how and why of *la Sociedad*—as members refer to the organization—points to an intriguing dialectic between scientific practice, sociality, and landscape. This also is a story about human engagements with and imaginings of the nation and its history.

In Chapter 3 I consider some of the ways the Society and speleological knowledge are dialectically produced. I focus on the creation of the group's publication and the definition of what would eventually become the Speleological Cadastre of Venezuela. I argue that the group's publication, which contains the cadastre, is not just the material instantiation of scientific knowledge and practices. These practices in effect *create a space* within which an alternative mode of science is possible (or at least imagined). I propose thinking about the cadastre as a “boundary object” to help explain how actors with diverse views collaborate to produce scientific knowledge, in this case, speleological knowledge (Leigh Star and Greisemer 1989). Their coming together, however, requires attending to the experiential quality of cave exploration. In this chapter I also consider early efforts to standardize cave surveying and mapping techniques. This was not just a debate about how, but also about why. Thus, speleological practice was entangled with moral and ethical judgments that helped define the SVE's boundaries as a distinct group.

In Chapter 4 we head underground as I analyze cave exploration and mapping practices. This broadens my investigations into the relations between sociality, scientific practice, and landscape. How does a cave map come into being? What do these maps represent? My analysis reveals a distinct way of relating, both physically and

conceptually, to the environment, its representations, and to others with whom we explore and survey this environment. Understanding these points again requires keeping the peculiarities of caves in the foreground. Moreover, in the case of caves, cartographic and exploratory practices are in a dialectical relation that pivots around the scale and lived experience of the human body in contact with stone. Cave mapping challenges the depiction of cartographic practices as devoid of sensorial and poetic engagement with/in the world.

In Chapter 5 I describe various attempts to read the Speleological Cadastre of Venezuela. These readings take place both within and beyond the very caves the cadastre aims to represent and order within a particular system of knowledge. As in my visit to (what I *think* was) Eduardo Röhl Cave, my “reading” attempts to find a correspondence between the representation and place in the world. It emphasizes an understanding of humans’ engagements with place as relational, temporal, and multiple (e.g., Massey 2005). Where does the map fit in this relational approach? I argue that we consider these engagements in dialectic with representations (Csordas 1994; Lorimer 2005; Macpherson 2010). This includes their symbolic, material, and even affective qualities. While the past chapters have focused on the processes of producing these representations (defining survey standards, mapping in the field), here I turn to their multiple and sometimes contentious readings.

Chapter 6 examines speleology’s sporting-science duality as it plays out at different points of the SVE’s history and from the perspective of key players. This is a quality that has been shown to splinter speleological groups elsewhere (Cant 2006). Yet, I suggest that in practice, speleology’s sporting-science quality has the capacity to unite as

much as to divide its members. I test this idea not just among SVE members, but also among SVE members and the indigenous Chaima guides of the northern Monagas karst whose environmental knowledge and trekking skills have led to the success of expeditions to the area. This case provides a novel perspective on “cultural encounters.”

With caves, I suggest, we are dealing with a particular kind of landscape whose exploration, mapping, and study involves a group effort whose success is premised on a variety of skills and expertise. While in Chapter 3 I argue we think about the cave map and registry as boundary objects, here I consider thinking about the broader cave landscape as a boundary space whose exploration has the potential to bring diverse actors together in a common task, a common experience. This examination also aims to temper the “scientific” bias in my own analysis by attending more to the “sporting” side of human engagements with/in the landscape.

Chapter 7 examines some of the blurry boundaries between citizens and the state in the context of the broader geopolitics of speleological practice. In counterpoint to the arguments presented in earlier chapters, which present caves as distinct spatial domains hidden from technological and state reach, the Society’s national speleological project is revealed here as potentially risky in so far as it could be appropriated by the state for purposes that most Society members might reject both on political and moral grounds. Are cavers making caves visible for the state? That is a question I consider here, which members of the Venezuelan Speleological Society have asked themselves at different points of the organization’s history, with different effects. Again, the geographies of speleology are shown to have complex and multidimensional spatialities that spill beyond the prescribed spaces “of science.” Their dynamics pervade geological, ecological, and

political landscapes that explorers must learn to negotiate in order to practice speleology and explore both the caves, and alternative visions of, the nation.

Finally, in Chapter 8 I turn to two topics that beg closer attention. First, I consider some of the ways an anthropology of speleology resonates with ethnographic inquiry more generally. Second, I reflect on my own positionality vis-à-vis my object of study. I do this as I traverse Guácharo Cave's more hidden passages, with map in hand, the very map that Garbisu and Pérez helped created back in 1967.

Chapter 2

Of Monuments and Men: The Exploration of Guácharo Cave and the Origins of Venezuelan Speleology

Two years prior to Garbisu and Pérez's 30-day stay inside Guácharo Cave, Pérez joined the members of the Sección de Espeleología de la Sociedad Venezolana de Ciencias Naturales (Speleology Section of the Venezuelan Society of Natural Sciences or SE-SVCN) on their attempt to finish the exploration and survey of Guácharo Cave. The ambitious week-long expedition took place during the 1965 Holy Week, while many Venezuelans traveled to the beach to vacation under the hot Caribbean sun.¹ This expedition joined a long history of attempts at revealing and understanding this cavern. Alexander von Humboldt visited the cave in 1799 and produced what is regarded as the first scientific description of any cave in the Americas (Humboldt 1966[1817]; Urbani 1999, 2005). He also collected, scientifically named, and described its raucous inhabitant, the nocturnal oilbird, or "guácharo" (*Steatornis caripensis*) (Humboldt 1981[1817]). Humboldt's visit, along with the presence of guácharo colonies, were key in making Guácharo Cave an important cultural, political, and even economic regional and national landmark. In 1949, the Venezuelan government inaugurated the Alexander von Humboldt

¹ In Venezuela, Holy Week is the longest national holiday of the year. Thus, it has and continues to provide a perfect opportunity for speleologists to plan their most important expeditions year after year.

Natural Monument, the nation's first, at the site. Yet, as of 1965, speculations of the cavern's true dimensions remained, with no complete or accurate map in sight.

This chapter revisits this 1965 expedition as a key precursor to the national speleological project that would begin in earnest in 1967 with the foundation of the Venezuelan Speleological Society. I tell this story in the context of Guácharo Cave's natural history. In doing so, I introduce caves' material and symbolic qualities as embedded in a broader natural and cultural landscape. By natural history, I follow Hugh Raffles's definition: "an articulation of natures and histories that works across and against spatial and temporal scale to bring people, places, and the non-human into 'our space' of the present" (2002:7). In particular, I focus on the attempts to explore and represent it, processes aimed at "stabilizing" the cavern as a knowable and bounded object of science. I describe a number of key events that transpired before, during, and after this week-long effort. Not only did this effort dramatically further the cave's survey, it also reconfigured the foundations of Venezuelan speleological knowledge and practice. For example, in this expedition, new members contributed novel field techniques that made a more thorough and accurate study of Guácharo Cave possible.

In fact, this 1965 expedition in several ways challenged institutional science in Venezuela. Against the traditional practical and ideological hierarchy and exclusivity that characterized the Speleology Section, along with most other institutions of science and learning in the country, the group's new director at the time welcomed new members and valued them for their skills, regardless of age, social status, and institutional affiliation. The gesture and conditions for this invitation were unprecedented. Those who embraced the status quo and saw their own scientific ambitions challenged resisted. Tensions and

disagreements culminated in the breakup of the group and the creation of the Venezuelan Speleological Society in 1967. This new Society's identity as an independent, autonomous, non-hierarchical, collective, open, and civic scientific enterprise of national scope makes it an odd phenomenon in the history of Venezuelan science. That the group has been in continuous existence for over 40 years, along with its publication, makes it even more remarkable.

As I argue throughout, explaining the how and why of *la Sociedad* points to an intriguing dialectic between scientific practice, sociality, and landscape. This requires keeping the experiential, affective, and relational qualities of scientific practice in the foreground. All of these qualities come into being in and with place. In the case of caves, my approach is not just about acknowledging their "physical reality" (Prufer and Brady 2005:7). Instead, I embrace caves as spaces experienced in all of their complexity. This complexity is not simply a quality of caves, but of *humans exploring caves*. Encounters with/in caves are not just about encounters with stone. Movement within underground passages involves shifting patterns of light and darkness, sound and silence, as bodies negotiate their next steps, not quite sure where they might lead (Bille and Sørensen 2007; Helmreich 2007; Taylor 1996). Encounters with/in caves also are potent affective experiences with the potential of exciting the imagination (Eshleman 2003; Sheets-Johnstone 1990). It is with this dialectical understanding of caves and human bodies that I revisit key events at Guácharo Cave, events that had such profound impact on the site, its local community, and the history of Venezuelan speleology.

How do some of these qualities impinge on scientific practice? The goal of the speleologists was to explore and survey the entire cavern. Yet, the limits of their own

bodies' capacity (and at times even willingness) to explore *and* survey every possible passage also means acknowledging the limits of their scientific enterprise. One of the most intriguing characteristics of cave exploration is that one might never know if the end of a cave was ever reached. Even today, some cave explorers suggest Guácharo Cave might contain unexplored passages. Despite years attempting to learn, know, and reveal Guácharo Cave, its precise identity remains elusive, mysterious, unbounded.

Telling the story of that 1965 exploration of Guácharo Cave and the origins of the Venezuelan Speleological Society in the context of a broader natural history reveals other intriguing subversions and entanglements. Well before Europeans arrived to the Americas, Guácharo Cave already was a sacred site for indigenous communities in the region. Providing this context also highlights the Venezuelan speleologists' efforts to define their relationship to past explorers (Humboldt being the most important) and to the state's project to monumentalize the site. This also is a story, then, about human engagements with and imaginings of the nation and its history.

Guácharo Cave in Time and Space

For thousands of years, the slow but steady trickle of acidic water has dissolved the limestone that crisscrosses the Turimiquire Range of present-day northeastern Venezuela. The limestone in which Guácharo Cave developed dates to the Inferior Cretacean (SVE 1968). In fact, the process of limestone dissolution has peppered the landscape with many caverns. Most are hidden from plain view under the thick forest. Most also are *alive* both as part of dynamic hydrological systems and as sites of rich ecological diversity. With each drip, stalactites grow a little longer, and below, stalagmites grow a little taller. The

cave you leave behind is, to an almost imperceptible degree, not the same one you entered.

In this region of Venezuela, a cold drip might also come from one of the hundreds of oilbirds that have made the underground their home (Bosque 2004).² These nocturnal oilbirds, or guácharos, rely on echolocation to navigate darkness, whether in the cave or in the region's forests as they search for the fruits of Oil Palm and laurel trees (Bosque, Ramírez, and Rodríguez 1995). Once back in their caves, guácharos regurgitate the fruits' seeds. The seeds pile up by the millions and, when mixed with mud, guano, and water, fill them with a pungent smell.³

Guácharo Cave in Indigenous Cosmology and Practice

Guácharo Cave also is alive with a rich cultural history. To the indigenous communities that had inhabited large extents of northeastern Venezuela, caves were an important part of their material and ideational landscape.⁴

Chaimas' relation to the Venezuela's northeastern karst landscape dramatically changed with European incursions dating back to at least 1542 (Urbani 1993). There is unconfirmed evidence that the cave may have been the center of resistance of Urimare,

² For this reason, Guácharo Cave guides recommend that visitors keep their mouths closed when looking up at the vast ceiling of the cavern's first gallery.

³ Despite the oilbirds' presence as far north as the island of Trinidad and as far south as Ecuador, Guácharo Cave is only among a few caverns in the continent where tourists can appreciate the relations forged between oilbirds, bats, the many species that depend on their regurgitated seeds and guano, the cavern, the forests, and the rivers beyond. However, Guácharo Cave is by far the most famous, and to many, the most beautiful, the most majestic.

⁴ Indeed, the indigenous and folk importance of caves is not limited to northeastern Venezuela. It extends to indigenous communities living in the karst regions of the Perijá Region and southern Venezuela (Perera 1988; Scaramelli and Urbani 2006; Vilorio 2002). See Chapter 1.

an indigenous woman *cacique*. She was purportedly captured and killed by the Spanish in the coastal town of Cumaná sometime between 1609-1610 (De Civrieux 1998:42; Urbani 1999:52). Since the mid 1600s, Aragonese capuchins and Franciscan friars rivaled each in gaining control of land and indigenous populations. The threat of French, English, and Dutch colonists and pirates compounded these rivalries. By the mid 1700s, creole ranchers also claimed land and labor. Despite repeated efforts to resist these invasions, a large portion of the indigenous population—Chaima, Coaca, Pariagoto, and Warao among them—were put into *reducciones*, or christianized settlements (De Civrieux 1998:39-80). It was in two of these settlements (Santa María and San Francisco del Guarapiche) that Friar Francisco de Tauste carried out his linguistic study among the Chaima between 1660-1664. Scholars and current Chaima activists alike recognize Tauste’s work (1964[1678]) as the first thorough source on indigenous culture in the region, even while noting its limitations and biases (Biord 2006; De Civrieux 1998; Urbani 1996, 2005).⁵ Tauste also authored the first known published description of Guácharo Cave, focusing on its mouth, its subterranean river, some cave formations, and the guácharo (Urbani 1996).

In his ethnography *Los Chaima del Guácharo: Etnología del Oriente* (1998), Venezuelan anthropologist Marc de Civrieux relied heavily on Tauste to reconstruct the “process of acculturation” of the Chaima. This history prefaces his ethnography carried out between 1970 and 1975 among Chaima “descendants, who survive in the hidden

⁵ Nicolás Zapata, whom I interviewed in Caripe in 2008, concurred with this view. That year, he was one of the main leaders within Asochaica, an organization of regional activists dedicated to the research, reaffirmation, and political recognition of Chaima indigenous culture. Venezuelan anthropologists Horacio Biord has been analyzing this resurgent indigenous movement (Biord 2005, 2006). I thank Biord for pointing me to key Asochaica members, all of whom kindly helped me with my work.

landscape of the eastern mountains [of Venezuela]" (de Civrieux 1998:21). Based on extensive oral histories and accounts collected from among the elderly "descendants," de Civrieux affirmed the continuity of Chaima beliefs and practices. These beliefs and practices are intricately tied to the landscape, both above and below ground.

As de Civrieux notes, "the caverns and mountains, abundant in the Caripe range, were and continue to be considered sacred places, natural magical temples where the spirits of ancient *piazan*, the souls of dead ancestors ... roam" (1998:169). Yet, none is more important than Guácharo Cave. To the Chaima, this cavern is the home of *Amanaroca* or *Chotokompiar*, the creator of the people. He was born in Guácharo Cave to his father the Sun and his mother the Air. He had a brother, *Uruipin* o *Coronoima*, with whom he fought and threw against a hill. The nearby Cerro Negro, the Turimiquire Range's second highest point at 2,430 meters, is said to be the Uruipin's transmuted body (de Civrieux 1998:166-167; Peñalver Bermúdez 1993:29). Not only is Guácharo Cave the birthplace of the first Chaima, it also is the place where souls of ancestral shamans take refuge. In its darkness they take the form of guácharos (de Civrieux 1998:116; Peñalver 1993). These ancestral shamans also are owners of the caves and shadows, both revered and feared as the guardians of tribal law. And, "while these spirits can come to the aid of men, by means of the *marequeros* [spiritual leaders], they can also cause infinite harm when they feel threatened" (de Civrieux 1998:124). This ambivalent character, both of the caves and the spirits they contain, is an aspect of indigenous notions of the underground that has been repeatedly overlooked, a point to which I will return.

Not angering the spirits of the caves was particularly important during the Chaimas' yearly incursions underground to capture guácharos (de Civrieux

1998:116;121-125).⁶ When young, oilbirds contain a large pouch of fat under their skin. The Chaimas valued this oil very highly for its purity. They used it to season foods (de Civrieux 1998:147). They also ate the birds' meat. Guácharo hunting continued well after the establishment of Christian settlements in the region, much of it to satisfy the demand of missionaries who used the oil for lighting their lamps and cooking (de Civrieux 1998:123,157).

Oilbirds make nests along the higher ledges of the cave walls, far from the ground so as to be out of reach from predators. In the case of Guácharo Cave, whose impressive first main and relatively horizontal gallery ranges from 20 to 30 meters in height, hunters constructed tall ladders, sometimes up to 20 meters long, with a single wooden pole and small branches tied horizontally as steps (SVE 1968). At its top end they tied an *hacho* or torch to light their way.⁷ Juan Ribero and Isaías Calzadilla, two of the elderly men whom de Civrieux interviewed in the mid 1970s, noted that much preparation was involved in

⁶ Tauste was among the first to describe this indigenous practice (Urbani 1996). Archaeological evidence suggests that it dates back to at least 1,500 A.D. (Perera 1976). Current and past Guácharo Cave guides, many whom grew up in the immediate vicinity of the cave, suggest that this practice, devoid of its ritual importance, was alive well into the mid 1960s. It slowly came to an end with the transformations of Guácharo Cave that followed the declaration of Venezuelan's first natural monument in 1949 at the site. It is currently illegal to hunt guácharos in the cavern.

⁷ De Civrieux bases these descriptions on the accounts of Tauste (1964[1678], 1680), Humboldt (1966[1818]), Codazzi (1974[1835]), along with oral accounts of Chaima descendants he interviewed in the 1970s. He does not include a first-hand ethnographic account of this hunting practice. As I note in more detail in Chapter 6, the sophistication and extent of the hunting skills involved in oilbird capture have been appreciated and described most fully by members of the Venezuelan Speleological Society. Thanks to the support and knowledge of Chaima men, SVE members located and surveyed the caverns, many of them deep pits, of the mountains surrounding the Caripe valley during the 1970s and early 1980s (Galán 1981; 1991). In fact, Chaima descendants who live in the Turimiquire mountains away from the hustle of the Caripe valley retain and routinely put into practice the skills required to enter caverns, many of them much more physically challenging than Guácharo Cave, and capture oilbirds for their oil and meat (Galán 1981; 1991).

the yearly ritual. Under the direction of the spiritual leader or *cacique*, up to a dozen men gathered the necessary wood for ladder-building and torches that only the *cacique* himself could assemble (de Civrieux 1998:125). They also prepared gifts for the spirits.

In the words of another of de Civrieux's informants, Elogio Caripe,

No one can enter the cave without bringing gifts to the *kámara* [spirit]. After the *cacique* offers tobacco and rum, he speaks [to the *kámara*]: 'these people will enter with much respect and order, they will enter with me. From you your birds they will take, no more, no less, they bring gifts. Place your birds low for them! They only want to take what is necessary and share them among all. They are good and do not want to cause harm in your house. [de Civrieux 1998:125]

Another of de Civrieux's informant, Luis Arrayán, detailed the consequences of not following the rules: "if [the men] do not obey the rules, they get lost, they are taken away by the spirits of the cave and are turned into stone" (de Civrieux 1998:127).

As a focal point in the cultural landscape of the indigenous Chaima, Guácharo Cave was a site of origin, death, but also regeneration in the form of guácharo oil, meat, and communion with their ancestors. The Chaima maintained and honored these qualities through engagements that emphasized respect and exchange. The arrival of missionaries and naturalists, however, altered these human relations with the physical and ideational landscape. Enacting western ideologies of natural science, whereby nature was to be objectified and represented, an increasing number of visitors sought to penetrate the cave deeper and deeper, often ignoring or disregarding the sacredness of this site.

European and Creole Incursions into Guácharo Cave

According to Venezuelan speleology historian and geologist Franco Urbani, no other cave in the Americas enjoys the "extraordinary historical richness" of Guácharo Cave

(Urbani 1999:51). With this statement, however, we must acknowledge the bias and violence in such history; much of this “depth” and “richness” is evident to the historian (and the anthropologist) due to early European incursions that produced many textual references of the site (Wolf 1982). Urbani’s work is my primary source in a summary of this textual history (Urbani 1999, 2005).

The search for slaves along the coast of South America may have lead European traders to the Guácharo Cave region by 1542 (Urbani 1999:52; Urbani 1993). In early 1659, Capuchin missionaries founded the Santa María de los Angeles mission just north of the Cerro Negro mountain and from there explored the area. That same year, Agustín de Frías and Miguel de Torres were the first of these missionaries to visit to the cave. The first known document to mention the cavern is a letter that Frías wrote to the Bishop of Puerto Rico in 1660. Frías’s fellow missionary José de Carabantes authored in 1666 the first published account of the cavern. Francisco de Tauste, who in 1664 founded the San Francisco de Chacaracuar mission south of the Caripe valley, originally published in 1678 the important work already noted. The number of European and creole visits to Guácharo Cave increased after the founding of the Santo Angel Custodio de Caripe mission in 1734. This mission, located only a few kilometers from the cavern in what is now Caripe, soon became the main Capuchin center in eastern Venezuela. In 1773, the bishop of Puerto Rico, Manuel Jiménez Pérez, and his secretary Iñigo Abbad de la Sierra, made an official visit to the cavern. Abbad produced a manuscript, dated to 1781, which describes a short portion of the cave’s large main gallery, its stalactites, the oilbirds’ evening exodus, and the indigenous bird hunting and oil extracting practices. In 1795, the Venezuelan creole Dr. Francisco de Ibarra visited the cavern. He probably made it as far

in as 802 meters (Urbani 1999:52; 1996).⁸ Four years after, Alexander Humboldt visited the cave. He did not make it as far as de Ibarra. Yet, the impact of his visit was profound, and some argue, categorically different from any before this time.

Humboldt In and Beyond Guácharo Cave

Scholars have critically examined Humboldt's importance in Latin American natural and political history (Burnett 2000; Cañizares-Esguerra 2005, 2006; Carrera 2011; Dettelbach 1996; Pratt 1992; Raffles 2002; Saldaña 2006). Mary Louise Pratt judges Humboldt as the most successful agent of transcultural dynamics that lead to the reinvention of both the Americas and Europe (1992:111-112). According to Pratt, he pioneered among Europeans naturalists descriptions of "nature in motion, relational" although these are often "depopulated, dehistoricized" (1992:120-121). However, to some Latin American scholars, such critical reading does not go far enough (Cañizares-Esguerra 2006; Saldaña 2006). To them, much scholarship on the history of science in Latin America remains Eurocentric, perpetuating the view of Latin America as culturally backward and derivative (Cañizares-Esguerra 2006; Lafuente and López-Ocón 2006; Saldaña 2006). With regards to Humboldt specifically, Cañizares-Esguerra (2005) challenges the assertion that he was the founder of ecology. Instead, Humboldt derived his relational notion of nature in part from both indigenous and creole ideas. These ideas were already in vogue among Spanish American scholars that the German naturalist came in contact with and depended on during travels between 1799 and 1804. This point emphasizes the

⁸ This is the length of the cave's massive first and largest gallery and also the only one to contain guácharos since the hole that leads to remaining passages is too small for their comfortable crossing.

fact that by this time, Spanish America had already experienced three centuries of growing and at times quite productive scientific traditions. If we consider the cultural heritage of indigenous knowledge, this history extends back even further (Cañizares-Esguerra 2005, 2006; Mignolo 2005; Pratt 1992; Saldaña 2006).

There is little doubt, however, that Humboldt's travels and writings played a profound role in Hispanic creole naturalists' imaginations as they forged their nationalist visions and agendas (Carrera 2011; Pratt 1992; Saldaña 2006).⁹ Humboldt's approach to natural history—one premised on analogies based on direct observation and experience—resonated with at least some creoles' own home-grown Enlightenment projects of national natural histories (Carrera 2011; Saldaña 2006).¹⁰ The flip side of the embrace and celebration of this Humboldt's achievements as a natural scientist, however, is the idea that "America needs European culture to provide it with information about itself" (Carrera 2011:80).

⁹ Although precisely what shape this role took is a point of debate. Again in a revisionist stance, Cañizares-Esguerra challenges Pratt's assertion that

Humboldt's representations of a lush, exuberant tropical America captivated Latin American elites desperate for European validation. Pratt's thesis marvelously fits our expectations of the nineteenth-century Latin American comprador bourgeoisie: hopelessly derivative. But Pratt is wrong. At least in Mexico, intellectuals forging a national landscape furiously fought *against* the type of landscape aesthetic first introduced by Humboldt. [2006:153-154, but see Carrera 2011 for a counterpoint to this argument that, if anything, emphasizes creole elites' diverse reactions to Humboldt's influence]

¹⁰ For example, nineteenth century Mexican geographer Antonio García Cubas revered the Prussian. Cubas's popular and influential *Atlas pintoresco é histórico de los Estados Unidos Mexicanos* (*Picturesque and Historical Atlas of the Mexican United States*) (1885) follows Humboldt's geographical approaches and incorporates copies of Humboldt's own images produced during his travels in Mexico in the early 1800s (Carrera 2011:67).

In Venezuela, Humboldt has been a revered icon, at least among the elite, second perhaps only to Simón Bolívar (Briceño Monzón 2005). Not only was the country's first natural monument christened in his honor, so was one of the highest peaks in the Venezuelan Andes (Bolívar Peak is the highest). The government of Pérez Jiménez (1948-1958) declared the creation of the monument at Guácharo Cave in Caripe in Humboldt's honor. It also commissioned the construction of a luxurious hotel at the top of Avila Mountain with views of the Caracas valley to the south and the Caribbean sea to the north.¹¹ It was called Hotel Humboldt.

Pérez Jiménez's policies promoted a 'New National Ideal' that sought industrial developments alternative to oil (Reig 2006/2007:63). Along acknowledgements of social repression, historians and indeed, many Venezuelans, recall the Pérez Jiménez as Venezuela's great Modernizer (Carrera Damas 1972; Coronil 1997). This involved creating an economic, civic, and cultural infrastructure that materially and symbolically transformed the nation's landscape, with the state focused on "constructing the nation" with monies from the growing oil industry (Coronil 1997:72-73,167).

The creation of the first natural monument at Guácharo Cave could be understood as an early step towards this transformation. Indeed, the selection of Guácharo Cave reflected Pérez Jiménez's vision of a nationalism that not only modernized the country, but at the same time respected tradition and elevated, in his words, "the Venezuelan spirit" (Coronil 1997:168). That the monument was named after Humboldt suggests that Europeans might still have an important role to play in the definition and consolidation of

¹¹ While Pérez Jiménez did not officially become president after elections in 1953 (these elections are believed to have been state-orchestrated), he already was exercising extraordinary power as member of the military junta that took over the country's leadership after a 1948 coup (Carrera Damas 1972; Coronil 1997).

such spirit.

Humboldt and his companion, French botanist Aimé Bonpland, visited Guácharo Cave on September 18th, 1799. To Urbani, this event marked the “birth of Venezuelan speleology,” despite the fact that they were not the first to explore Guácharo Cave (Urbani 2005b:56).¹² This was not Humboldt’s first encounter with the underground. In Europe he had already visited famous caves in England, Romania, and Germany (Urbani 2005b:56). Humboldt’s original travel itinerary to the Americas, which began in June of 1799, did not include a stop along the shores of northeastern Venezuela. That changed when a fever outbreak in his ship forced a stop at the Cariaco Gulf of Cumaná. Here he first heard about a large cave with birds, prompting him to lead his expedition inland (Humboldt 1966[1817]:81).

On September 15, Humboldt and Bonpland arrived at Caripe. At the time Caripe still was a very small village of mostly indigenous families living within the bounds of missionary religious norms. On September 18th, their missionary hosts and Chaima men led the two Europeans along a short hike uphill to Guácharo Cave. In his *Personal Narrative of Travels to the Equinoctial Regions of the New Continent During the Years 1799-1804* (1966[1817]), he describes the experience, emphasizing a series of surprises that captivated the visitors. The cavern's gaping entrance was the first among them (Fig.2.1):

[The entrance] forms a vault eighty feet broad and seventy-two feet high. This elevation is but a fifth less than that of the colonnade of the Louvre.

¹² Nor does Humboldt in any of his writings formally acknowledge his work as contributing to speleological science. As noted in Chapter 1, the conceptualization of such a science did not occur until the late 1800s, although plenty of naturalists and explorers already had been investigating aspects of cave hydrology, geology, and ecology that would later become the hallmark of speleology (Shaw 1979).

The rock, that surmounts the grotto, is covered with trees of gigantic height. . . . What a contrast between the Cueva of Caripe, and those caverns of the North crowned with oaks and gloomy larch-trees!
Humboldt 1966[1817]:123]

Humboldt placed this particular cavern, not just in comparative context with other caves, but in relation to general laws that inform predictions of what he might encounter. His chapter ends with a lengthy consideration of the possible origin and date of the cave, accurately noting that it must have resulted from limestone dissolution at a time when this theory still was not broadly accepted (Humboldt 1966[1817]:140-141; Shaw 1979, 2004; Urbani 2005a:57). Moreover, preceding the multidisciplinary spirit of this science, he also focuses on other aspects of the cave environments: its flora, fauna, and cultural uses and visions associated with the space. To Urbani, this scope brands Humboldt's *Personal Narratives* as his "major speleological contribution" (2005a).

Guácharo Cave further surprised the naturalist on other counts. First, vegetation sprouting from the millions of regurgitated seeds could be found well within the cavern where daylight reaches only partly, dimly, and in some cases, not at all (Humboldt 1966[1817]:124). Second, the cavern's guácharo proved to be a new species, which Humboldt named *Steatornis caripensis* (Humboldt 1981[1817]) (Fig. 2.2). Bonpland captured two guácharos, not for their oil or meat, but for their value as specimens of science (Humboldt 1966[1817]:133).

The cavern (this portion of it, at the time the only known) bewildered the senses with its form and content. Visitors encountered a dark and humid subterranean vault, with a pungent smell of mud, guano, burning torches, and that noise... that wild cacophony of guácharo cries that human intrusions with their lights made more intense. Upon exiting the grotto, Humboldt describes being "glad to be beyond the hoarse cries of the birds, and

to leave a place where darkness does not offer even the charm of silence and tranquility” (Humboldt 1966[1817]:136).

Finally, the cave’s relatively uniform shape intrigued Humboldt (1966[1817]:131). At his reported 472 meters from the entrance of the cavern, he specifies, “[t]he Grotto of Caripe preserves the same direction, the same breadth, and its primitive height of sixty or seventy feet” (1966[1817]:131). Based on the description of that point in the cavern, however, Urbani argues that Humboldt’s party only made it 422 meters from the cave’s entrance (1975). Venezuelan speleologist and founder of the Speleology Section Eugenio de Bellard, however, disagreed with Urbani, siding with Humboldt’s assertion (de Bellard 1980). Regardless of the exact distance traveled, it is intriguing that the group had to turn back when it did. Humboldt knew that the cavern was at least 300 meters longer. He learned this at the convent from Dr. Francisco de Ibarra’s written account of his 1795 cave visit that I already noted above.¹³ The only explanation we have of this turn of events on that September day comes from Humboldt himself, since there is no other known account produced by any other member of the party. As Urbani explained to me, Humboldt never stated precisely who or how many these members were in any of his writings. In his *Personal Narratives*, he notes

The missionaries, with all their authority, could not prevail on the Indians to penetrate farther into the cavern. As the vault grew lower, the cries of the guacharoes became more shrill. We were obliged to yield to the pusillanimity of our guides, and trace back our steps. [Humboldt 1966[1817]:135]

With this, the depiction of the Chaima guides as fearful and superstitious is sealed, repeatedly echoed to this day in descriptions of Humboldt’s truncated scientific

¹³ Humboldt, erroneously, identifies this visitor as a bishop from Guiana (Humboldt 1966[1817]:135; Urbani 1996, 1999:52).

aspirations. Yet, it is consistent with Humboldt's interpretation of indigenous relations to the caves. In his view,

The natives connect mystic ideas with this cave, inhabited by nocturnal birds; they believe, that the souls of their ancestors sojourn in the deep recesses of the cavern. ... To go and join the guacharoos, is to rejoin their fathers, is to die. ... Darkness is every where connected with the idea of death. The Grotto of Caripe is the Tartarus of the Greeks; and the guacharoos, which hover over the rivulet, uttering plaintive cries, remind us of the Stygian birds. [Humboldt 1966[1817]:132-133]

Where Humboldt sees death, the Chaima see the potential for life, for regeneration, through the oil and meat of the birds captured as part of a ritualistic exchange with their ancestors. Countering a dichotomy that renders light as good and dark as evil, to the Chaima, an "ambivalent character" characterized caves and their spirits (de Civrieux 1998:169). Whether this character took a benign or evil tinge depended on human's relations to these entities and the space that housed them. It depended on following *el reglamento* (the rules).

Even if we do not have any other sources on the events of that day, clues in Humboldt's own text that point to other factors that may have contributed to the early retreat:

We find, that a bishop of St. Thomas of Guiana had gone farther than ourselves. He had measured nearly 2500 feet [960 *varas*] from the mouth to the spot where he stopped, though the cavern reached farther. ... The bishop had provided himself with great torches of white wax of Castille. We had torches composed only of the bark of trees, and native resin. The thick smoke which issued from these torches, in a narrow subterranean passage, hurts the eyes, and obstructs the respiration. [Humboldt 1966[1817]:135-136]

This passage powerfully grounds a projected reconstruction of the events of that September day. The party had set out early in the morning from the convent along a hike to the cavern's mouth. Within the cave they walked along the banks of the inner river as

much as they could. Sometimes they had to wade in the water, a traverse that amounted to plenty of “thick mud” (Humboldt 1966[1817]:131,134). Present-day visitors to Guácharo Cave can only imagine the challenge of such an excursion, since they benefit from a cement and stone trail that covers the entire 1,200 meters of the tourist route. Even then, the path requires constant cleaning to keep it from caking up with mud that makes the passage, which has no handrails, extremely slippery. Most certainly, Humboldt’s party benefitted from much more light than do current tourist groups: the former had several people hoisting torches, while the latter rely on the gas lamps that their single guide carries along the irregular trail.¹⁴ Less light, but no smoke. Add to this the rising shrill of the perturbed guácharos, it is not hard to imagine some in the group—maybe even the distinguished visitors?—eager to turn back and get out.

Many narratives of discovery are heroic tales of man overpowering nature, often by virtue of ever sophisticated technological might. Not here. His exploratory yearnings cut short, Humboldt must have been tempted to push on. He knew that the cave went further. Imagining that episode, it is impossible to miss the irony of a man so celebrated for his vision, at the mercy of his unidentified indigenous guides and other local companions, their smoky torches, the mud, the birds’ wild racket, and the imposing darkness.

With Humboldt’s account as our only source, we might never be able to reconstruct the precise events of that September day at Guácharo Cave, at least not from others’ perspectives. Yet, consideration of these very material and symbolic hurdles to exploration helps us appreciate the complex dynamics that mutually shape human

¹⁴ This has prompted some tourists, who are not allowed to use personal flashlights in the cavern’s sector with oilbirds, to use the screens of their cellphones to help light their step.

experience and place itself. Humboldt's own narrative reveals details that subsequent texts that reference it have ignored or edited out. I reject treating the cavern and its distinct ecology contained therein as concept or mere background or context (Bonsall and Tolan-Smith 1997; Brady and Prufer 2005). Favoring a view of humans as organisms in constant engagement with and perception of the material world around them, bodies and landscape affect each other (Csordas 1994; Ingold 2000; Macpherson 2010; Merleau-Ponty (2005[1945]); Mlekuž 2011).¹⁵ Chapter 4 revisits and expands this analysis of human-cave encounters. For now, this theoretical approach to such encounters aims to broaden the interpretative possibilities of that fateful event at Guácharo Cave in 1799. Thus, not only must we ask the extent and manner in which Humboldt was an agent of imperial power. We must consider him as a being with an "affected body" in a complex "web of relations" with other beings in a place whose particular affordances shape and are shaped by the dynamics of such relations (Ingold 2000:166-168; Mlekuž 2011:3). This perspective contributes to a natural history that "bring[s] people, places, and the non-human into 'our space' of the present" (Raffles 2002:7). It also a perspective that must remain with us as we follow the developments of speleological science in Venezuela since Humboldt's fateful visit.

The representation of the fearsome and superstitious Chaima guides remains, but not without its challenges. During my many trips into Guácharo Cave between 2007 and 2008, I heard several guides suggest an alternative interpretation: Perhaps the Chaima companions did not deem it proper for Humboldt and party to go in any further. Doing so

¹⁵ With *affect* I follow Slovenian archaeologist Dimitrij Mlekuž's use of Deleuze and Guattari (2004) in his analysis of the ways bodies (both human and non-human) and caves mutually constituted each in the Neolithic Karst (2011).

might have disrupted the peace of their ancestors' souls that they believed rested in the cavern's depths. This interpretation rejects the notion of the frightened Chaima whose superstition stands in the way of science. Instead, it suggests that of the conscientious and even proud Chaima who protect their world from the incursion of outsiders. Members of the Venezuelan Speleological Society that forged strong bonds with Chaima descendants during their cave explorations in the mountains of the Caripe valley during the 1970s also reject this depiction (Galán 1981:29). As one of them told me,

[Humboldt's explanation] is bullshit. I can guarantee that those guys [the Chaima guides] weren't afraid. Humboldt was simply echoing a stereotype that his audience expected to have confirmed by his own experiences.
[Anonymous, Personal Communication, August 8, 2011]

Yet, since that September day in 1799, and, especially, since the publication and circulation of Humboldt's accounts, first in Europe and eventually in the Americas, Guácharo Cave's physical and cultural landscape were forever transformed. They spurred many more naturalists, both European and creole, to visit the site. On the one hand, this helped promote Caripe as an important cultural and economic center along Venezuela's eastern coast (Rogelio León and Mostacero Villarreal 1997). Historical records point to a small but growing community of expert guides or *baquianos* who profited giving tours into the cavern. Many of them and their families lived in the lands immediately adjacent to Guácharo Cave.¹⁶ On the other, it accelerated the almost 400-year-old process of "desacralizing a space traditionally dedicated to the cult of the ancestors" (de Civrieux 1998:169). The 1949 creation of the Alexander von Humboldt Natural Monument prompted the relocation of the families living next to the cave. The demolition of their

¹⁶ Although Chaimas are widely believed to have acculturated, while those considered their direct descendants mostly live in mountain villages away from the Caripe center, a few guides who grew up near or next to the cave still claim Chaima ancestry.

homes made room for the building of tourist infrastructure: a parking lot, a ticket booth, restrooms, a museum, a small administrative office, a restaurant, and a plaza that guides visitors in an orderly and mud-less manner to the cavern's gaping entrance. Once inside the cavern, stone and cement defines the 1,200 meters of tourist trail. A third of the distance along this path, visitors encounter a marble plaque placed there in 1959 commemorating 100 years of Humboldt's death (Fig. 2.3). It is 472 meters from the cave's entrance, the distance he claimed to have reached in 1799.

A life-sized statue of the German naturalist first greets visitors prior to entering the cave. This statue crowns a large cement structure located along the south side of the plaza that was constructed after removing the cave's *caserío* (hamlet) in the late 1960s. This structure doubles as seating area and barrier. Strategically placed along the edge of the winding road leading to the monument, its tall wall helps block the headlight beams of cars driving up at night. Thus, it minimizes the disruption such light might cause the photosensitive oilbirds as they leave the cavern at sundown. Every evening of the year, visitors gather here to listen to a cave guide narrate the history of exploration of the cavern and to learn about its geology and ecology. Since 1983 Germán López proudly has taken up this job. His authoritative voice and attention to historical detail builds up the visitors' anticipation of the bird's nightly exodus.¹⁷ As the night sets in (there are no lights in the premises), the birds' cackle grows louder, announcing their imminent exit. Meanwhile, Humboldt's stony silhouette watches over the nightly ritual.

¹⁷ While some birds do exit and return to the cave in the same evening, many do not. Recent research by Venezuelan ornithologist and long-time Venezuelan Speleological Society Member Carlos Bosque's ongoing research has found that many birds travel many kilometers beyond the cavern, and spend the night either in other caverns in the region or in treetops, sometimes up to three days at a time during their feeding trips, before returning to Guácharo Cave.

To portray the effects of Humboldt's impact on Guácharo Cave in a critical light contrasts with the celebratory tone of virtually all popular descriptions of his visit to the valley of Caripe. As current guides often state, while Humboldt did not discover Guácharo Cave, he certainly made it famous. During my time at Guácharo Cave between 2007 and 2008, I often walked to the area where local artisans sold their goods. There, I met a gentleman famous for his delicious traditional cakes and cookies made locally in Caripe, his life-long home. "People here give Humboldt too much attention," he told me during a conversation we had about the history of the cave. To our dismay, the belief Humboldt actually discovered the cave was very common, even among those whom we hoped would contribute to dispel such misinformation. A widely distributed newspaper publication produced by Caripe's Office of Tourism in 2008 included the error, prompting complaints (mine among them).

Within the complex and diverse "articulation of natures and histories" we must be traced to grasp more fully a place's natural history, some natures—indeed, some histories—bear more weight than others (Raffles 2002:7). The articulations of natures and histories at Guácharo Cave grew more complex: as more visitors penetrated its darkness with smoky torches, the birds and related ecologies had to adapt to more disruptions. Famed visitors signed their names on exposed walls. Fortunately for the cavern, few cave formation such as stalactites and stalagmites were accessible enough to become souvenirs. This is true within that first massive passage of the cave that extends 759 meters and ends in an impenetrable breakdown of rocks. Cave formations of astonishing beauty and well within reach lay further within the cavern, in sectors that would not be discovered and explored for more than 150 years after Humboldt's visit.

Humboldt's visit accelerated the desacralization of Guácharo Cave, from the perspective of the dwindling and increasingly assimilated Chaima community. Yet, from a different vantage point, the cavern was *resacralized* as a monument honoring a different set of characters and consolidating a different worldview that redefined the relationship between nature, culture, history, and the state. Instead of *Amanaroca*, many subsequent foreign visitors to the cavern paid homage to Humboldt and his European idealization and treatment of exotic nature. Guácharos became prized items for growing museum exhibits and private collections.

For the slowly consolidating class of European creoles with aspirations to emulate famous naturalists and, in some cases, spur the practice of science in the young American republic, Guácharo Cave became a perfect stage. Some retraced Humboldt's journeys, both figuratively and literally (Reig 2006/2007; Urbani 2005a). The cave's aura as national icon grew even stronger with another visit in 1835. While serving the Venezuelan government, Italian colonel and cartographer Agustín Codazzi visited Guácharo Cave. He traveled for the first time the actual tourist route (1,200 meters) and produced a widely circulated account of the experience (Codazzi 1974[1835]; Urbani 1999).

In the view of Venezuelan naturalists and government officials who shared Pérez Jiménez's vision of celebrating the "Venezuelan spirit" (Coronil 1997:168), Codazzi's visit further cemented Guácharo Cave's status as a site honoring the men who contributed to the making of the nation. Indeed, the cavern contained the three elements that were considered "fundamental sources" of this spirit: "history, religion, and popular culture" (Coronil 1997:168-169). The cave was a site with a long history of both indigenous and

catholic culture that the state reworked to fit its new national ideal. It did this while at the same time suppressing popular practices that escaped that vision (Coronil 1997:170-172). Thus, while the Pérez Jiménez government resacralized Guácharo Cave as the nation's first natural monument, it also transformed the physical and cultural landscape at great cost to the small community living next to the cavern. It also banned the practice of guácharo hunting, which continued (even if devoid of the ritual significance that Chaimas originally ascribed to it). Thus the creation of the Alexander Humboldt Natural Monument was another illustration of how

[t]he dictatorship's ambivalent attitude toward the popular sectors rendered more visible a contradiction at the heart of Venezuela's democracy which is covered by the state's celebratory discourse of the people: the construction of el pueblo at once as the foundation of the nation's sovereign identity and as a primitive mass to be shaped by the (more) enlightened elite. [Coronil 1997:172]

The cavern was resacralized in other ways as well: Until recently, catholic masses were conducted in its main passage. Visitors and explorers alike sometimes left religious icons deep underground as offerings, but also as signs of their feats. Moreover, for some current and past Venezuelan speleologists, a visit to Guácharo Cave could take the form of a pilgrimage. This could occur in various senses. It could take the form of a homage to a past speleological lineage, which might (or might not) include distinguished European naturalists. It could be an act that reaffirmed speleological alliances. For those who participated in those early years of fervent exploration, returning to Guácharo Cave and traversing its passages were and remain powerful embodied acts that stir memories of physical exertion, exploring alongside friends within a space that has barely, perceptively, changed.

Speleological Incursions into Guácharo Cave

The purported farthest passages of Guácharo Cave were not reached until 1957 (de Bellard 1957; Urbani 1999). Before then, exploration was slow. Several times the high levels of the cave's subterranean river turned explorers back thinking they had reached the end. These explorers continued to be European naturalists, but increasingly, Venezuelan nationals (urbanites from Caracas and local *cariperos* alike). Caripe guides had particular incentive to "push passages." Greater knowledge of the cavern gave them greater fame that they used to lure the most distinguished (and wealthy) visitors. The idea that some of them enjoyed the potential of exploring "new" cave, regardless of potential utilitarian benefit, also must be considered. This is a point to which I will return repeatedly in future chapters.

Key moments in the history of exploration of Guácharo Cave include German geologist Alfred Scharffenorth's visit in 1890. He is widely considered to have made the cave's next major exploratory breakthrough when he reached the cave's famous *Paso del Viento* (Wind Pass). However, recent research suggests that this distinction belongs to Venezuelan Ezequiel Gómez, who at the time of Scharffenorth's visit owned the land where the cave is located (Urbani and Furrer 2007). As a narrow and water-filled point of the cave, located at 1,041 meters from the entrance, the Wind Pass deterred many visitors for more than 50 years. In 1946 Caripe natives Víctor Ciliberto, Francisco Vera, Cirigliano, and Jesús Rodríguez crossed the Wind Pass, opening up a new period of cave exploration (de Bellard Pietri 1957; Urbani 1999, 2005a). They did this by completely submerging their bodies in water. The low level of the cave river left a small space by the ceiling of the pass for them to breath. There is no first-hand account of this event.

However, when I first faced the prospect of crossing the Wind Pass in 2008, I wondered what these men must have thought and felt standing where I was, with water up to my shoulders. The first person to cross Wind Pass would have had no idea what there was beyond that small, pitch-black opening in the rock. He would find out without the aid of a light source, since he probably did not have a waterproof headlamp. Thus, he would have had to rely on all of his limbs (hands, legs) to probe his way in the dark, water-filled passage, until, unexpectedly, the cave opened up again. What did he think and feel *then*? What prompted him to *go forth*?

In 1957, an expedition of the Speleology Section of the Venezuelan Society of Natural Sciences claimed to reach the cavern's end (de Bellard 1957; Urbani 1999). One of its founders and members, Juan Antonio Tronchoni, was part of the group that on April 17, 1957 reached the point in the cave believed to be the farthest from the entrance. This is a small room at the end of a long tunnel filled with large stone blocks. In a subsequent trip, the explorers placed a small statue of the Coromoto Virgin, a revered Catholic figure of Venezuela, at this site. It is now known as the *Salón de la Virgen* (Virgin's Salon) (SVE 1971).

On that day, Tronchoni was not alone. Expert Guácharo Cave guides Ramón Alén, and Jesús Rodríguez accompanied Tronchoni. Neither of them had ever reached this point of the cavern before. Rodríguez was of Chaima descent (Urbani 2005a:3). Notably missing from the group, however, was Tronchoni's close friend and Speleology Section co-founder Eugenio de Bellard. That day he was exploring another section of the cavern. In an interview a year after Tronchoni's death in 2007, his widow Dylcia Caires recalled Tronchoni's own account of that event (Caires, Interview, August 25, 2007). It

was one of the most extraordinary days in his life. Knowing how much de Bellard would have wanted to be in his place, he carved his initials, along with those of his good friend de Bellard, on the cave wall.

The Speleology Section of the Venezuelan Society of Natural Sciences

In the early 1940s, Juan Antonio Tronchoni met Eugenio de Bellard Pietri in Caracas. De Bellard had just returned from studying in France. There, he learned about speleology, and became enthusiastic about the prospects of pioneering this young science back in Venezuela. He and Tronchoni became close friends. They traveled frequently to caves around Caracas and then some further afield, such as Guácharo Cave (Fig. 2.4). Guácharo Cave, in particular, became an obsession for the two young men. On April of 1952, de Bellard, Tronchoni, and de-Bellard's half-brother Roberto Contreras founded the Speleology Section of the Venezuelan Society of Natural Sciences.

From the start, the Speleology Section's focus was the exploration and survey of Guácharo Cave. This was no coincidence. To push passages in Guácharo Cave was to retrace and go beyond the purported 472 meters that Humboldt and Bonpland reached in 1799. It meant surpassing the efforts of Italian colonel and cartographer, Agustín Codazzi. Further, this was the country's first natural monument. The fact that the exact dimensions of the cavern had not been determined, much less mapped, must have been an irresistible draw for the young *caraqueños* aware of their status as speleological pioneers in their country.¹⁸ Guácharo Cave became the perfect space to test their exploratory

¹⁸ The term *caraqueño* refers to a person from Caracas, the capital and by far largest urban center in Venezuela.

capacities and naturalists' sensibilities, much in the same mold as previous Venezuelan and foreign "Hombres de Ciencia" (Men of Science).

Beyond Guácharo Cave, the founders of the Speleology Section envisioned a project of national scope. All of the country's caves would be located, explored, surveyed, and mapped. This detailed registry would serve as a foundation for further speleological science. Despite the expressed nationalism in the Speleology Section's ambitions, its members did not deny or erase the European contributions to the making of Venezuela's "nature." Instead, they followed along their path, transforming the landscape with monuments of their own. In 1959, 150 years after Humboldt's death, the SE-SVCN honored the German naturalist by placing a marble plaque in Guácharo Cave at 472 meters from the entrance, the point where Humboldt claims to have reached during his 1799 visit (see Fig. 2.3). In many ways the gesture captured the ideological bent of the group, or at least, its leader. De Bellard wrote many articles on Guácharo Cave for both popular and scientific national audiences, as well as for the growing international speleological community (e.g., de Bellard 1951, 1957). His idolatry of distinguished European and creole naturalists is evident in these texts. In 1953 de Bellard presented a paper on the exploration of Guácharo Cave at the First International Congress of Speleology held in Paris. In contrast to Humboldt's presentations about his American discoveries to his European audience over 100 years before, de Bellard represented the efforts of the Venezuelan elite in producing and defining its own brand of natural history, adapting to regional circumstances and sensibilities the European model of speleology.

These efforts have interesting historical antecedents. Beginning in the 17th century, the profile of an authentically patriotic science was beginning to take shape

within Hispanic America (Cañizares-Esguerra 2006; Saldaña 2006). European and creole intellectuals and missionaries living in the colonies who increasingly felt identified with their viceroyalty led this effort. As several authors recently have stressed, the viceroyalties of New Spain were relatively independent from the directives of the Spanish crown (although the degree to which this was true varied throughout their long 300 year history). Thus, they ought to be viewed more as kingdoms, each with its own distinct identities, than as mere dependencies, for this is how their elite populations and leaders viewed them from within (Cañizares-Esguerra 2006:12). It is a mistake then to interpret the regional efforts to spur science in these territories solely as a desire to Europeanize them under the directives of the crown. Instead, regional players embraced—at different times, in different ways, and with different allegiances—scientific knowledge couched within the broader Enlightenment ideals as a way to promote viceroyalty identity and development. These “patriotic” efforts only intensified when travelers and naturalists from continental Europe (some of them never stepped foot anywhere in New Spain) began to promote theories of a (both physically and morally) degenerate and backward colony (Cañizares-Esguerra 2001, 2005, 2006; Saldaña 2006). I see the early enthusiasm of institutional speleology in Venezuela as intensely nationalist even as it embraced European speleological models that it would eventually reconfigure to fit its local conditions. This is true even as (or perhaps precisely because) several early SE-SVCN members were recent European immigrants who had fled war and persecution in their birth countries and were eager to make Venezuela their new home.

Viewed in this light, an interpretation of Humboldt’s marble plaque must go beyond that of the Speleology Section’s respect for European explorers and its embrace

of a particular kind of relation to nature and its history. This plaque also could be read as honoring the group's own efforts since its placement marks the point where Humboldt turned back and they carried on. It is a boundary point. Standing to read its text pays homage to the European naturalists' achievements, but also to their limits. Roberto Contreras, the last living of the three SE-SVCN founding members, commented of his half-brother de Bellard, "He was always stuck on these big scientists," a point that was evident in de Bellard's choices for naming caves throughout the country (Contreras, Interview, March 4, 2008). The marble plaque was a material instantiation of the group's attitude towards monuments, and the importance of their placement in nature. Moreover, the plaque honors so-called "Grandes Hombres de Ciencia" (great men of science) of which there are only few, and who demand respect and praise. To be a worthy scientist then, involved recognizing your forbearers, along with a hierarchy that extended to the members of the SE-SVCN. In the case of speleologists, to travel to Caripe to explore Guácharo Cave can be seen as a pilgrimage to the site where Venezuelan speleology "was born"— the physical efforts involved in traversing and surveying the cavern a tribute to a particular lineage, its particular ideology, a distinct set of practices, and the enveloping space that is both object and place of practice.

To many of the cavers whom I interviewed who eventually passed on to be, in 1967, part of the Venezuelan Speleological Society (SVE), these ideas in their extreme represented those of the old guard. These were ideas that the emerging SVE, particularly with the entry of a younger generation, would distance itself from since they were contrary to its spirit as an open, horizontal, non-elite, democratic, and above all, systematic and scientific organization. Moreover, this Society celebrated the

collaborative efforts of civic science, independent and autonomous of larger institutions, such as academies, universities, of even, religious organizations such as the La Salle Society of Natural Sciences. This new speleology, embodied in the Venezuelan Speleological Society, broke from the ways natural science was practiced in the past in Venezuela. Guácharo Cave was a key space where these transformations played out.

A Change of Leadership and a New Vision of Venezuelan Speleology

Young men of Caracas's elite class predominantly made up the active membership of the Speleology Section, which, until the mid 1960s, hardly ever surpassed 10. This befitted the identity of the Venezuelan Society of Natural Sciences, itself a prestigious organization of which de Bellard's own father, a medical doctor, was an honorary member. Among other early members was de Bellard's cousin, Eduardo Schlageter, the son of a wealthy Venezuelan painter of German descent. Tronchoni could not boast coming from a family of wealth. He was, however, like other early SE-SVCN members, a recent European immigrant whose family sought reprieve from their war-torn home countries. One early member, Ramón Alberto Hernández, was an important exception: he was neither a recent European immigrant nor part of Caracas's social elite. I will return to his story further on.

Few of the members of the Speleology Section were formally trained in science. De Bellard studied one year of medical school before switching over to law. Others, such as Carlos Tinoco and Marcos Sandoval, were bankers. Antonio de la Rosa, like Tronchoni, became an insurance agent. Raul Alvarado Jahn, the grandson of Alfredo Jahn, a revered Venezuelan scientist, had a degree in civil engineer. In 1957, Italian immigrant Carlos Bordón greatly enriched the group with his experiences as a caver in

his hometown of Trieste. Yet, as several of these early members recalled, Eugenio de Bellard dominated the direction and inner workings of the group.

De Bellard's influence changed in 1965. That year, Juan Antonio Tronchoni became the de-facto director of the Section since his friend de Bellard moved to the city of Maracaibo, located in northwestern Venezuela, to work as a lawyer for Shell Petroleum Company. Under Tronchoni's leadership, a number of important changes within the Section ensued. As summarized in its October 1965 report to the directive of the Venezuelan Society of Natural sciences, within that year the Speleology Section began its own library and published the first volume of *El Guácharo*, a bulletin dedicated to the dissemination of its activities to the wider public, and specifically, to other caving communities around the world. There also was a record number of attendees at its weekly meetings (from October 1964 to October 1965, the average weekly attendance more than doubled). This was the result of a new "open door" policy that put an end to the exclusivity of the Speleology Section. With this policy, Tronchoni and friends welcomed a new generation of high school and university students who would redefine the way speleology was practiced in Venezuela, and, in the process, the national cave landscape. At the same time, old friendships would be strengthened and new bonds of relatedness forged, many alive to this day.

A New Generation of Speleologists

Omar Linares and Wilmer Pérez began exploring and mapping caves in 1964. Both high schoolers at the time, they struck a friendship through their common love for science. Moreover, as each noted in independent interviews, they respected each other for their

timeliness and commitment to their planned fieldtrips. As members of the Sociedad de Ciencias Naturales La Salle (La Salle Society of Natural Sciences), they participated in scientific projects with field outings along the outskirts of Caracas and beyond. Linares was fascinated with bats. He learned about speleology from a copy of French caver Norbert Casteret's *Ma vie souterraine - Mémoires d'un spéléologue (My Life Underground – Memoirs of a Speleologist)* (1961) that he loaned to his friend Pérez. Casteret impressed the two young men. In libraries they “burnt their eyelashes,” in the words of Linares, reading over as much speleological literature as they could find. Most of all, they studied cave maps. According to Linares, they “taught themselves” how to survey caves by putting what they had read into practice. They then produced detailed maps that they used as a letter of presentation to the directive of the SE-SVCN. Indeed, the quality of their work is all they had to show (Linares, Personal Communication, September 19, 2011).

Neither Linares nor Pérez came from wealthy families. Pérez in particular was of very limited means. Both relied on public transportation to get to the outskirts of Caracas, where they had heard there might be caves. Once off the bus, they would ask locals if they knew of any caverns in the area. Some would accompany them in hikes to the mouth of caves. The two young men used battery-operated lanterns purchased in a hardware store. As I will describe at length in Chapter 4, basic cave surveying requires six basic tools: a tape measure, a compass (to read the horizontal direction of passages), a clinometer (to read their vertical displacement), paper and pencil to write these values and sketch the shape of the passages, and a light source. All of these tools are relatively easy and economical to purchase, making the economic and technological barriers to

speleological activity relatively low. This is a remarkable fact about speleology since it makes it a relatively accessible scientific activity when contrasted to other pursuits that might yield comparable “discovery” potential, such as deep water or space exploration.

Linares recalls that in their first cave outings, he and Pérez used

a field compass (very cheap), a tape measure—not too long—, and a barometric altimeter that Gordo Musso [a friend from the La Salle Society of Natural Sciences] [and then they would] take the information in their field books and then they would fix it up at home, to scale and all, with ink on paper... [Linares, Personal Communication, September 19, 2011]

Moreover, the *process* of cave exploration, with the body in constant negotiation with the unpredictable underground environment, appealed to Linares and Pérez since they both enjoyed the outdoors. Pérez in particular divided his time as a teenager (and since) between caves and mountains. But the degree to which the young explorers had to coordinate their efforts and help each other traverse the subterranean landscape was unmatched by the exploration of any other kind of geography. Thus, it was in the caverns of Caracas that an intense friendship, which lasts until this day, was forged between these two men. Much of its intensity and longevity, I suggest, has to do with the peculiar dialectic between scientific activity, the underground landscape, and the distinct sociality and embodied practices it engenders. But more on this in Chapter 4.

For now, I must stress how shocked Linares and Pérez were to receive an invitation from the directive of the Speleology Section to join their ongoing expeditions. They were shocked because they were very young, and neither had any connections to the Venezuelan elite. As I will describe further, Linares and Pérez were only the first of a number of young students who would soon swell the ranks of the Speleology Section, and shortly after, the Venezuelan Speleological Society.

The 1965 Guácharo Cave Expedition

Eager to finish a job that had dragged on for too long, in 1965 the Speleology Section organized a week-long expedition to finish surveying Guácharo Cave. It was a major operation that involved setting up camp within the cavern's largest room, the Gran Salón (Grand Salon), which measures 100 meters along its east-west axis and with the ceiling hovering between 10 to 15 meters in height (SVE 1971). With this effort, Venezuelan speleology elevated itself to the ways committed exploration was being practiced in other famed spots elsewhere, both above and below ground.¹⁹ Despite that in 1957 the purported end of Guácharo Cave had been reached, much surveying remained to be done, and many side leads had been passed up pending exploration.

Nineteen members of the Speleology Section participated in the 1965 Holy Week Guácharo Cave expedition. Linares and Pérez were among them. Veteran members Carlos Tinoco and Raul Alvarado Jahn were expedition leaders, while Tronchoni was equipment coordinator. Two months prior to the April event, the SE weekly meetings dedicated time for preparation. This included defining both the individual and collective equipment, coordinating who would contact both the public and private sectors for donations, and discussing topics such as the need for discipline during the expedition.

¹⁹ Setting up base camps led to important breakthroughs in mountaineering. Edmund Hillary and Tenzing Norgay had relied on them to reach the summit of Everest in 1953. Could similarly organized base camps, where explorers could refuel and rest while still remaining on task, help push the limits of subterranean passages? Swiss and Belgian speleologists pioneered this practice in 1949 during their exploration of Switzerland's Hollöch Cave, at the time the longest known in the world (Tschümperlin 2011). Aiming to surpass that record, U.S. cavers set up camp deep within the Flint Ridge cave system, just north of Mammoth Cave in Kentucky, in 1953 (Brucker and Watson 1987). These were events that the Venezuelan speleologists were aware of through the international cave club and society publications that they received.

They were able to secure a relatively low price for plastic bags from an ice company in Caracas (0.4 bolívares each). An optical store donated a compass and a jewelry store a chronometer. At the time the group also enjoyed a small monthly donation of 200 bolívares from the Ministry of Public Deeds, although this was short-lived. Linares was put in charge of determining and purchasing the required equipment for biospeleological research. Prior to the event members were also encouraged to purchase overalls that were specifically lined with an impermeable material in anticipation of the expedition. Echoing a militaristic tradition that characterized other famous expeditions such as pre-WWII Everest climbs, everyone would have a uniform (Ortner 1999:46-49).

The nineteen members divided into two groups, with the first taking off to Caripe from Caracas on April 9th in the group's Land Rover wagon (approximately an 8 hour drive). Once in town, the group drove up along the small winding road that led to Guácharo Cave. As already noted, even though the Monument had long been established, the infrastructure that would eventually alter the setting immediately beyond the cavern had yet to be built. The small hamlet of homes where several families lived was still there. The Salazar family in particular offered extraordinary support to the SE-SVCN expedition. As the *celador* (caretaker) of the cave, Ramón Salazar had been accompanying Venezuelan speleologists into the cavern and supporting their efforts since the late 1950s. By 1965, he was hired by the Ministry of Agriculture and Livestock that administered the monument.²⁰ One of Salazar's neighbors was the Magallanes family

²⁰ This ministry would go on to become the Instituto Nacional de Parques in 1973 (Reig 2003). After 1967, the speleologists (now as the Venezuelan Speleological Society) extended to Salazar official recognition as "collaborator."

(Fig. 2.5).²¹ The young Benjamín Magallanes, in his late teens at the time, proved to be the most valuable and dedicated local guide to the speleological efforts. This is mentioned in the official publication of the description of the explored and surveyed cave that appeared in two parts (the first in 1968 and the second in 1971) in the *Boletín de la Sociedad Venezolana de Espeleología*. Thus, unlike narratives about the cave such as Humboldt's, the SVE specifically named and acknowledged the contribution of key members of the local community to the speleological enterprise. As I will argue in Chapter 6, this was an important precedent to future attempts to enlist local support in both exploration *and* surveying efforts, and to do so in a way that challenged colonial hierarchies and unequal balances of power (or so was the hope).

In stark contrast to speleological expeditions a decade later, exploration in Guácharo Cave was *relatively* accessible. By this I mean that the car carrying explorers and equipment could be parked close to the cave's entrance (within approximately 200 meters).²² The total distance of traverse within the cavern from the entrance to the point of the underground campsite is just under 2 kilometers. Most of the passage connecting the two also is relatively horizontal, requiring some stooping and minimal crawling. There are, however, two points that challenge explorers with large amounts of equipment. The first is passing the almost completely submerged and narrow *Paso del Viento* (Wind

²¹ I examine the kin ties among Guácharo Cave guides in Pérez and Galindo 2009.

²² In an article that provides a retrospective view on the SVE's 55 years of exploration, the authors describe a shift in exploratory techniques and approaches to the geographical and geological challenges posed by unexplored caves (Urbani, Galán, and Herrera 2006:21). While the more accessible caverns (those closer to the road and/or requiring less technical climbing ability within) were explored first, later, exploring new caves became more physically and technically demanding. This in turn led to the rejection of the "old timers'" expedition style characterized by the use of voluminous and heavy equipment. I return to this topic in Chapter 6.

Pass) that I have already described. The amount of equipment (surveying tools, sleeping cots and hammocks, food, carbide for the headlamps) had to go through this point. Thus, the issue of how to keep everything dry was a technical challenge. Some creative solutions backfired. During a 2007 interview, Carlos Tinoco, one of the “veteran” members who joined the SE-SVCN in the mid 1950s and went on to found the SVE with Tronchoni in 1967, brought out his overalls with the impermeable lining (Tinoco, Interview, June 13, 2007). With laughter, he noted what a terrible idea that had been since the pockets would fill up with water and not drain. Old tire tubes and plastic bags were used to waterproof equipment. This was an improvement over the empty gasoline cans that had been used in the past to pack the supplies. The air within these containers made them float, requiring much effort to submerge them to a point along the pass wide enough that they could fit through.

Ramón Hernández remembered that the key to staying warm and energized, after several hours submerged in water passing equipment through the Wind Pass, was to take swigs of *chinguirito*, an alcoholic drink made with cinnamon, cloves, sugar, and rum that the families who lived in the hamlet in front of the cave prepared and sold to visitors (Hernández, Interview, October 27, 2007). Everybody drank chinguirito, including Linares and Pérez. Once past the Wind Pass, the explorers were both soaked and well within the non-tourist sector of Guácharo Cave. From there they continued to walk 100 meters along a relatively straight but low passage cut through by the underground river. The cave again challenged the group and its voluminous equipment at the *Piedra del Mecate* (Rope Rock), a slippery ledge, 5 meters in height. Once at the top of this pass, the explorers had to push their freight along a small tunnel that required they squirm along on

hands and knees. Once through, they had arrived at the Grand Salon in time to set up camp and begin the work of dividing up the work ahead.

Tensions Rise Within Guácharo Cave... and Shake Up Venezuelan Speleology

Since he had left Caracas to work in Zulia and Tronchoni had become the director of the Speleology Section, de Bellard had distanced himself considerably from the activities of the Speleology Section. According to fellow cavers, these activities increasingly upset him. SE-SVCN member Carlos Bordón explained that among de Bellard's concerns was the entry into the Section of many young members whom he considered anarchists and communist (Bordón, Interview, August 22, 2007). Bordón conceded that in part he was correct. He noted that among the new members was Oscar Garbisu, Pérez's partner in the 1967 month-long Guácharo Cave expedition. Bordón noted that at the time he was an aspiring photographer who had broken into a photography store to steal some equipment. Moreover, Venezuelan politics in the 1960s were charged with the potential threat of communist revolt. As the Venezuelan cavers knew well, speleologists and speleological knowledge had played a role in the success of the Cuban Revolution (Forti 1998).²³ The last thing the conservative de Bellard wanted was his Section infiltrated with revolutionaries who would use the country's underground as bases for operation.

On 1965, the Speleology Section members voted on their new officers. De Bellard was demoted from director, a post that he had held since the founding of the group in 1952, to "Equipment Keeper." This must have been a blow for a man who, based on the account of many (including his daughter, a staunch defender of her father's life

²³ See Chapter 7.

achievements), considered himself the founder of Venezuelan speleology (De Bellard, Personal Communication, March 2008). To Bordón, de Bellard's "egocentrism" contributed to the fallout in his friendship with Tronchoni and the eventual creation of the Venezuelan Speleological Society in 1967.

Events that transpired on that 1965 expedition to Guácharo Cave gave further momentum to these transformations. Eugenio de Bellard had not been part of the expedition planning since he was already in Maracaibo. Yet, he traveled to Guácharo Cave, unannounced, when work at the cavern was ongoing. Pérez recalled that de Bellard "became upset [once he arrived] because he expected that we would all stop working and greet him like a king" (Pérez, Personal Communication, 2008). According to Pérez, de Bellard complained that some "caga-leches" (milk-poopers) had been put to work on the cavern's speleological project.²⁴ Several others who were present at the cavern that day echoed this description and interpretation. Ramón Hernández, however, offered a different perspective: "De Bellard felt very hurt that he was placed to work as a subordinate instead of as director" (Hernández, Interview, June 25, 2007). Indeed, Hernández would eventually abandon the newly formed Venezuelan Speleological Society after, in his words, he "found out what actually happened from the mouth of de Bellard ... I could not abandon him." The fact that de Bellard, according to Hernández himself (and confirmed by others), paid him for his speleological work must have affected this allegiance. As already noted, of the early members of SE-SVCN, which included several men of very wealthy families, Hernández was among the least formally

²⁴ With the term *caga-leche* de Bellard referred dismissively to the young age of the Speleology Section's new members (they were not full members yet, but *colaboradores* (collaborators)). Pérez and Linares were, respectively 15 and 16 years old at the time.

educated and the poorest by far. "We formed a great team, a symbiosis: He collaborated with me with expenses, with transportation, and I collaborated with him with photographs, with written reports, with the actual exploration," Hernández told me in 2007.

Differences in leadership styles and visions between de Bellard and Tronchoni culminated in the suspension of the Speleology Section and the creation, in 1967, of the Venezuelan Speleological Society, which all active members of the Section joined.²⁵

Two Leadership Styles, Two Visions of Speleological Science

The contrast between the leadership of de Bellard and Tronchoni epitomized the contrast between the traditional and new form of practicing natural science in the country. De Bellard's dominant personality played a role in his leadership style of the Section, a point that both friends and foe have stressed. Yet, Tronchoni also had a strong personality, and his leadership style, which favored a collective, non-hierarchical, and open project, differed immensely from that of his friend de Bellard's. This difference could be better appreciated in terms of the two men's vision of Venezuelan speleology. De Bellard considered himself the pioneer of Venezuelan speleology, which, if we consider his role in fomenting the idea of the creation of the Speleology Section based on his experiences in France, is true. But more importantly, he cast the structure and activities of the Section in the mold of traditional natural science institutions in the country. The cult of "Great Men of Science" dominated these institutions that were, by definition, exclusive organizations that only a select few could join. That these members also were part of the

²⁵ De Bellard was not an active member at the time, although he remained part of the Board of Directors of the mother institution, the SVCN.

Venezuelan social, economic, political, and racial elite was no coincidence. They were individuals whose “proper moral and civic character” was deemed fit to engage in scientific pursuits, generate scientific knowledge, and thus forge paths of national progress.²⁶ They also were friends who partied together, attended each other’s weddings, and became godparents’ to each other’s children.

Understanding Tronchoni's fervent support for speleology as a scientific pursuit, despite him not being a scientist himself, must be considered in the context of Venezuela's modernizing project that began, mainstream Venezuelan historiography has it, in 1935 and intensified in the 1950s and 1960s.²⁷ This intensification benefited from two key factors: a wave of skilled European immigrants and the drastic increase in oil income. This modernization involved the creation and expansion of an educational and industrial sector that promoted scientific and technical pursuits viewed as critical for national development (De la Vega and Vessuri 2008). Based on his editorials and accounts of those who knew him, it is not far-fetched to presume that Tronchoni viewed

²⁶ Historians of science have explored link between the production of scientific knowledge, morality, and even bodily capacities and dispositions. Shapin and Schaffer powerfully illustrate the link between such a judgment and a person's perceived capacity to produce credible knowledge (1985). In the mid 1600s, Robert Boyle confronted the problem of recruiting divers to conduct his hydrostatical experiments. On the one hand, they had to be skilled and sturdy enough to bear the stresses of deep-water diving. On the other, they had to be persons worthy of trust, if their testimony of their bodily experiences underwater were to be believed. As Shapin and Schaffer show, precisely who counted as trustworthy depended on their social status, as defined within English society. In the context of the history of science in colonial Iberia and Spanish America, Cañizares-Esguerra highlights the “chivalric” model of science that dominated in the 17th century. This model presented the “cosmographer as knight, or the knight as cosmographer” whereby adventures involving risk in the search for knowledge and truth were the mark of gentlemanly valor (Cañizares-Esguerra 2006:10).

²⁷ Venezuela’s longest ruling dictator, Juan Vicente Gómez, died in 1935. This event was followed by radical social, political, and economic changes in the country. Julie Skurski (1993) cautions against this linear reading of national history that cast Gómez as backward and his followers as enlightened modernizers.

university youth's involvement in speleology as contributing to nation-building.

Underlying this view was his national politics. Another SVE member who joined the Society when he was 14 years old, noted that "Tronchoni was an 'Adeco,' a supporter of the political party "Acción Democrática" (Interview, June 28, 2008). This party, founded in 1941, emphatically aligned itself with social movements that promoted participation by all members of society (Coronil 1997:145). This association would later change, as the party gained power as part of a political apparatus increasingly delinked from the realities of most Venezuelans. Yet, in contrast to others' beliefs in politicians as essentially corrupt individuals, "Tronchoni promoted honesty, good character, responsibility." He also promoted camaraderie by expanding the spaces of scientific sociality into restaurants and very often, his own home.

Tronchoni was, and remained until his death in 2007, deeply concerned with the problem of recruitment to the Society. Although he strongly urged that the SVE recruit members from universities, the group welcomed anyone willing to practice speleology as a collaborative scientific project of national scope. I argue that the organization provided a space for the development and practice of civic science that circumvented, and in effect rejected the elitism of Venezuelan scientific academies such as the Venezuelan Society of Natural Sciences. Researchers have examined the emergence and popularity of nature societies in 19th century Europe, highlighting how, as markers of a growing civil society, they contributed to the popularization of science, the democratization of educational opportunities, and the development of touristic travel and associated sensibilities of a budding middle class (Jardine and Spary 1996; Kennedy 2008; Secord 2002; Withers 2003; Withers and Finnegan 2003). Withers and Finnegan (2003) use the term "civic

science" to describe the activities of natural history societies in Victorian Scotland, arguing that an examination of these organizations' practices (field activities, the creation and maintenance of field museums and publications, the formal and informal gatherings to discuss group activities, community outreach, etc.) offer insight into 19th century Scottish notions of civic worth. This worth was premised on producing local natural knowledge, which effectively contributed to the consolidation of regional and national identity through scientific pursuits.

Investigating the existence of equivalent "associational activities" in Latin America is beyond the scope of the present research. Exhaustive search of the literature has yielded little. It appears that both in colonial Spanish America and in the independent emerging nations, science was an activity of individual elites, both European and creole alike. The closest reference to civic "associational activities" that I found were the early societies of friends of the nation that organized independently of imperial (including viceroyal) support (Lafuente and López-Ocón 2006:132; Saldaña 2006:59). These societies brought together polymaths, naturalists, collectors, and entrepreneurs who shared a concern for the modernization of their viceroyalties, which they thought of as independent kingdoms. Of course there were many collective efforts to promote science in the regions. Missionaries and imperial *técnicos* lead their own natural science campaigns, with the latter responding to a viceroyal commitment to know the land and its resource that got a strong boost during the reign of the Bourbons. Virtually all of the constitutions of the emerging independent states were drafted, the idea that the state should promote science for the public good and welfare of the nation (Saldaña 2006). This was the beginning of a relation in which science would become increasingly

politicized. This certainly has been the case of Venezuela, with some scholars noting its recent intensification during the Chávez presidency (Vessuri 2006).

In Venezuela, at least until the early 1940s, science was a pursuit of individual men who had both the economic and social capital to pursue their interests (Ruiz Calderón 1992; Texera Arnal 2002, 2003). American immigrant William Phelps, who settled in Venezuela in 1875, is credited with founding ornithology in the country (Texera Arnal 2002). U.S. trained botanist Henri Pittier (1857-1950) pushed for the establishment of this discipline in the country, as well as conservation projects that predated government policies of its kind (McCook 2002). The Academy of Physical, Mathematical, and Natural Sciences, founded in 1917, and even the Venezuelan Society of Natural Sciences, founded in 1929, had restricted memberships to such "individuals of science." Membership to the Academy, in particular, was limited to a small number of individuals (Carrillo 2003). As I will describe later, de Bellard eventually joined this organization with his publication of a Venezuelan cave registry (de Bellard 1969), a work that many SVE members criticized and dismissed as lacking scientific rigor.

The Venezuelan Society of Natural Sciences organized into several sections, each dedicated to a specific scientific endeavor (the Speleology Section among them). Sections were created around a common goal, attempting to channel members' collective effort in the advancement of a scientific project of national scope. Still, the social weight of the personalities that it counted as founders and directors often overshadowed or impeded the materialization of such collective ideal. Moreover, it kept the organization accessible mostly to men of Caracas's high class.

In 1943, Spanish monk Pablo Mandagen Soto (Brother Ginés) founded the La Salle Society of Natural Sciences, a sister organization to the men's school La Salle, where several of the second generation of young SE-SVCN members first received their scientific training (Pereda Núñez 2007). This organization was the first in the country to promote scientific pursuits among the youth, with an emphasis on fieldwork and research publications. The La Salle Foundation of Natural Sciences was subsequently created in 1957, the "daughter" organization of two institutions (one scientific and one religious): the La Salle Society of Natural Sciences and the La Salle Brotherhood. Similar to the La Salle scientific institutions, the creation of the Venezuelan Speleological Society, with its emphasis on the promotion of science among the youth, marked a categorical break from the organizational traditions that had dominated Venezuela until then (Pereda Núñez 2007). The SVE, however, was exceptional in several respects. First, it did not limit its membership to young men. The La Salle Foundation of Natural Sciences aimed to become a professional organization, thus primarily hiring scientific academics to lead its projects of national scope. This was not the case for the SVE, which has and remains a voluntary organization, where no one is paid. Third, the La Salle organizations were an extension of a much larger and resourceful institutional and ideological fabric: the La Salle Brotherhood. This parent organization defined the general course of the research agendas of its affiliated groups. In contrast, the SVE was intellectually autonomous—it members decided for themselves what and how they would research. To SVE member Francisco Herrera, who was part of the group from the 1980s to 2011, this point in particular makes the SVE an extraordinary phenomenon. Moreover, the land upon which the La Salle Foundation was built was part of the La Salle school. By abandoning the

institutional umbrella of the Venezuelan Society of Natural Sciences (and in the process alienating the members of its directive), the SVE was utterly alone, independent and autonomous—yes—but alone.

The SVE incorporated a new generation of young students, most from families of modest economic resources, some highly identified with leftist politics. Several were interested in careers in science, and saw their affiliation with the SVE as a way to further their interests through fieldwork and original research. Most of all, however, new members were attracted to the exploration of caves and the camaraderie this experience afforded. Soon friends of friends joined as well, first as aspiring members, adding to a social diversity (in terms of age, class, political views, educational, and career achievements and pursuits). This diversity was rare in civic associational activities of the time, but certainly unique among organizations aimed at a scientific project of national scope. More radical still, the group's leadership (Tronchoni, Tinoco, Sandoval, Bordón, and others) promoted this project under the banner of a collaborative organization—*la Sociedad*—that aimed to outdo and outlive any single individual. This was possible, Francisco Herrera noted, because the SVE's founders put into practice the odd idea that the leader need not be the expert. This he contrasted to de Bellard's leadership style, which followed a military model (Herrera, Personal Communication, August 12, 2011).

Although Herrera joined the Society twenty years after its founding, his view of these early years interested me, particularly as they contrasted to the organization's more recent challenges. Herrera also was keenly committed to the collaborative mantra of the Society's livelihood, which to him, as to many others, comes alive in the field. Hiking in the Mata de Mango region south of Caripe, Monagas, in 2002, Herrera stressed the

educational and moral value of group expeditions in the field. Such experiences promote a first-hand knowledge and respect for nature as well as the value of teamwork. "It should be part of everybody's education," I recall him saying, an opinion that he would restate during an interview five years later.

Pondering on the beginnings of the SVE and the career profiles of its founding members, it occurred to me that the group could have adopted a more exploratory focus, emphasizing field experience and not worry about publishing results. Like many other caving groups in the world, it still could have carried out systematic surveys, and even conducted some speleological research. Its work could have been published in a club magazine of limited circulation, their more scientific work sent off for publication in an established speleological journal of broad readership. That is the case of most cave clubs or "grottos" in the United States, each affiliated with the National Speleological Society. This organization publishes its national monthly *NSS News* that features a brief summary of grotto activity based on these club's reports. Unlike most caving organizations in the world, it also has a scientific peer-reviewed journal, *The Journal of Cave and Karst Science*, one of the world's premier speleological publications.

In Herrera's view, two key factors help explain Tronchoni's commitment to a national scientific cave project, which included an ambitious publication with peer-reviewed articles and the national cave cadastre. First, Tronchoni took on the challenge of outdoing the institution he left behind, the Venezuelan Society of Natural Sciences. "He challenged institutionality with even more institutionality... He had to be better than the table he kicked; he had to do more and do it better," Herrera stressed. Second, Tronchoni wanted to create an institution that would endure, and given the scientific boom of the

Venezuela of the 1950s and 1960s, he must have realized that creating an organization with scientific foundations would have a better lasting chance. There is an irony here, the idea of raising the stakes of an organization to ensure its survival. Yet, reflecting on the many interviews with SVE members, on hours either in the field or in the SVE premises, there is a palpable sense of pride in the group's achievements, and thus a resistance, a refusal to let it die.

And yet, as Herrera and many others who knew Tronchoni stressed, Tronchoni's vision of a collaborative speleological project, focused not on individual feats but on teamwork organized in a non-hierarchical and open manner, cannot be explained as a symptom of changing times. What Tronchoni did, to dedicate so much of his life to promoting speleology, to promoting *la Sociedad*, without care and indeed disdain to possibility that his own person become an icon of national speleology, remains a rare exception. As Herrera put it, "People like that don't exist, especially not in this country" (Herrera, Personal Communication, 2008).

At the risk of simplifying and misrepresenting the characters of two complex men, one whom I did not know personally but earned the respect of many (de Bellard) and another, whom I grew up loving as a charming godfather (Tronchoni), I have chosen to cast their visions of speleology in the context of Guácharo Cave's natural history. Here, personal and underground geographies and histories are inextricably linked. I see parallels between de Bellard's vision of speleology and his role in it and the celebrated monumentality of Guácharo Cave as a sacred site of the "Great Men of Science," Humboldt in particular. While there is no physical monument at Guácharo Cave honoring his contributions directly, he led the initiatives in creating monuments to Humboldt that

greatly altered the experience of the site (both the marble plaque and large cement structure that crowned with Humboldt's statue that I have already described above).

Even after he gave up cave exploration, de Bellard remained dedicated to Guácharo Cave. According to his daughter, who moved to Caripe from Caracas in 2007, one of her father's life-long ambitions was to make the cavern a World Heritage Site. "This is an ambitions I hope to fulfill in his memory," she told one evening as we lay on our backs on the cement steps her father had designed and commissioned. It was getting dark. There we waited as the guácharos started their nightly exodus to search for food, with a stony Humboldt keeping watch nearby.

Tronchoni also returned to Caripe repeatedly after he retired from cave exploration. He was involved in several efforts to promote speleological knowledge among Guácharo Cave guides. He also purchased a piece of land in downtown Caripe that he hoped would be the site of a regional speleological center. Few current cave guides remember him, although many more do remember de Bellard. Tronchoni was less interested in the monumental projects that preoccupied de Bellard. And yet, he was a critical player in the production of what is arguably the most important and ambitious icon of Guácharo Cave: a map featuring the cavern's 10.2 kilometers of explored passages. This map hangs in the small museum that only a fraction of the visitors to the cavern enter to see. The map represents a vision of the cave unlike any other in its long geological and cultural history. The collaborative effort that eventually resulted in its production was unique in the history of Venezuelan science. No names of individuals are listed on that map. Instead, the fading purple ink of a stamp at the lower right-hand corner of the yellowing paper reads: Sociedad Venezolana de Espeleología.

Guácharo Cave is Mapped... but Mysteries Remain

The Venezuelan Speleological Society's efforts to explore and map Guácharo Cave culminated in 1970, reporting 10.2 kilometers of passages. This value disappointed some veteran cave guides who embraced the hope that there was some truth to the myth that the cavern went all the way to Brazil.²⁸ Still, the 10 kilometer mark made the cave the longest in the country, a distinction it held until the end of the 1980s, when further exploration revealed longer caverns in northwestern Venezuela. The SVE published the Guácharo Cave maps, alongside thorough descriptions, in its new publication, the *Boletín de la Sociedad Venezolana de Espeleología*. This was done in two parts. The first, which appeared in 1968, corresponds to the first 1,200 meters of passage, the sector accessible to daily guided tours (SVE 1968) (Fig. 2.6). The remainder was published in 1971 (SVE 1971). This second fifteen-page report includes two fold-out pages. The first contains six color photographs highlighting some of the most beautiful cave formations. The second features the detailed map of the remainder of the cavern (Fig. 2.7 and 2.8). Care is required to unfold the map. It is delicately inserted and glued into the middle of the SVE's bulletin, which is 16.5 by 23 centimeters, half letter-sized. To fit the entire map within its

²⁸ This belief might be traced to a number of sources. According to long time Venezuela Speleological Society member Franco Urbani, who has meticulously researched the history of cave exploration in Venezuela, this myth probably originated with European botanist Nikolaus Funck's 1844 description of his visit to Guácharo Cave. In it he suggests the possibility that the oilbirds traveled as far as Brazil in search for food (Urbani 1999:53-54). De Civrieux also notes a belief among some of his Chaima informants that the cave might reach much farther than any man can ever know (De Civrieux 1998). These fantastic underground geographies echo a culturally and historically widespread conception of caverns as connectors to subterranean worlds (Williams 2008[1990]). Whatever their source, not knowing where a cave might lead only fuels its ambivalent character, its mystery.

dimensions, it has to be folded onto itself 6 times. Fortunately, the paper is of good quality and weight, every detail of the delicate lines of the survey clearly visible on its semi-gloss finish.

The map includes all of the elements that are considered standard for cave maps today: a title, an orientation arrow, a scale (8cm=100m), and both a plan and side view of the cavern. The plan view provides a perspective "from above," a view that would result if the mountain which contains the cavern were sliced along a horizontal axis, as in a layered cake about to get its filling. Guácharo Cave is predominantly a horizontal cavern, making this visual projection a very "complete" one. But the foldout also includes the cave's side view, or profile, as well as cross-sections that provide the map-reader added information about some of the most distinguishing passages. The side view slices top-down along the length of the cavern, this time cutting a serving slice from the cake. Plan and profile views are perpendicular to each other (Fig. 2.9 and 2.10). Cross-sections provide the same view that a doctor uses to show a patient the severity of a clogged artery; it slices the passage from top to bottom at an angle perpendicular to the main length of the cave passage (refer back to Fig. 2.6).

Cave explorers often are the be the first to acknowledge the limits of cave surveying and mapping in the quest to fully know and bound their object and place of study. This limitation of cartographic representations is not unique to cave maps. It is, arguably, characteristic of any map, a point that social scientists have stressed in their critical examination of cartographic practices, but is often and easily forgotten (Cosgrove 1999). Yet, in the case of cave maps, this indeterminacy is often symbolically expressed

in the representation itself.²⁹ And this is not just an artifice of the surveyor and cartographer. It is a symbolic marker of the metaphysical *fact* of caves as dynamic and porous places underground that can only be explored so far. Cave explorers grow to appreciate this reality through their experiences in the ground. Their ability to represent the cave rests on their knowledge of it. In turn, this knowledge depends on their ability to traverse its passages. As I further explain in Chapter 4, cave explorers and caves are mutually constituting: just as exploring caves makes an individual a cave explorer, caves themselves are revealed—indeed, *defined*—by explorers' ability to pierce their darkness with their bodies and lighting technologies.

Prior to my own visit to Guácharo Cave's non-touristic sector in 2008, I studied its maps intently. I noticed that at some points on the maps, the ends of passages are left open, with a question-mark (Fig. 2.11). These symbols index *going passage*. At these points, the cave does not close off, but keeps *going*. Explorers who were part of the 1965 expedition and subsequent efforts to finish off the survey of Guácharo Cave conceded what is a reality of cave exploration everywhere: that at some points, the probing body must turn back, either because it does not fit or because of other obstacles such as delicate formations that are deemed too valuable to justify their destruction for the sake of pushing the cave. But there is more.

The written description of the cavern mentions two galleries, the *Salón Agustín Codazzi* and the *Galería Negra*, that are not represented in the maps. It states how in 1961 a group of 7 explorers were able to squeeze through a tight fissure and make their way into what they consider to be "the two most beautiful rooms in the cave" (SVE 1968:

²⁹ See Chapter 4.

105). Not only were they of great beauty, with cave formations as formidable as they were delicate, access to the rooms could be dangerous. Concerns for the conservation of these galleries lead to excluding them from the final maps! That the textual description of the cavern does mention them suggests the cavers' attempt to offer a complete account of exploration, one that, presumably, would not be as replicable or easily accessible as a map, and thus less likely to lead to vandalism or negligence.

Thus, even the SVE speleologists, with their new vision of nature, with their radically new way of conceiving and practicing science in Venezuela, with their new way of representing the underground, have not succeeded in revealing Guácharo Cave completely. Even more surprising, *they concede the limits of their own labor in the very maps they produce*. This creates a tension that I will address further on: the tension between revealing and concealing, between sharing knowledge and secrecy. Several Venezuelan Speleological Society members remain certain that there is more to explore in Guácharo Cave. Yet, too much time had been spent there. Caverns all over the country beckoned. By the end of 1970, it was time to move on.

Conclusion

The qualities that stamp Guácharo Cave with its ambivalent character also spill over into the efforts of naturalists and speleologists, despite their differences, to reveal their object and place of study. A fuller appreciation of Guácharo Cave's natural history, then, must acknowledge its resistance at being completely revealed, stabilized, bounded. These qualities come into being as bodies traverse the cavern's passages. This is true not just in the efforts to represent it, but also, to explore it. But even if fully explored, is it fully

revealed? A cavern changes with every drip of water at the end of a stalagmite that leaves a speck of calcite on its tip and then falls and grows the stalagmite below. It changes with the rumbling of tectonic plates, with an active earthquake area located to just north along the Caribbean coastline. As acidic water continues dissolving away, blocks of limestone shift and fall. Both moving water and air erode the stone as well. And the guácharos. Might the growing threat of deforestation, even within national park land, diminish their nutritional sources to the point that they might not find living in the cavern sustainable? Without them a great variety of organisms that depend on the bird's guano and regurgitated seeds would disappear.

To come back to Guácharo Cave is to come back to a different place. Time does not stand still there. In fact, it does not stand still *anywhere*. Yet, relative to any space, any corner on earth, caves are among those where the rate of change is slowest. Enclosed and protected from outside turbulence, some caves have offered the perfect environment for species to escape from and survive climatic changes. They have adapted to their new environment by losing any pigmentation, losing their eyes, radically slowing their energy expenditure, and extending their lifespan. Yes, space is a product of interrelations, with many stories and paths coexisting within its sphere, and it is always under construction (Massey 2005). *And* its materiality mingles, collides, shapes, and in turn is shaped by qualities resulting in peculiar and distinguishing albeit ever changing characteristics, which, in this project, I examine and explore underground.

In this chapter I have considered the histories, the aspirations, and the motivations of a few who have trekked in those portions of the cavern that have yielded to human incursions. In particular, I have focused on a number of protagonists in the origins and

eventual consolidation of Venezuelan speleology. I have proposed a reconsideration of Guácharo Cave's natural history in light of speleologists' efforts both to honor past naturalists and to move beyond them. As I have shown, these efforts are echoed in different relations, ideological, material, and even affective, to monuments. I have aligned the early efforts of the Speleology Section of the Venezuelan Society of Natural Sciences (and its founder and director Eugenio de Bellard Pietri) with a monumental stance at home with the traditional and institutional view of science as the domain of "Great Men." In contrast, the creation of the SVE, marked a break from this view. To Juan Antonio Tronchoni, speleology ought to be a project of national scope that spurred the involvement of youth in science. The SVE became a unique space where young men (and eventually some women) could participate in a collective effort that was open, and democratic. A closer look at cave mapping itself further reveals the intensity of relations forged through its practice. These relations, in turn, made speleological science possible.

Chapter 3

Producing Speleological Knowledge, Producing Society: The Cadastre as Boundary Object

During the Holy Week break of 2008, the Venezuelan Speleological Society again skipped the sun and headed to the heavily forested mountains of the Monagas state in Eastern Venezuela in search for caves. This was my third expedition with the group, and, just as in the two previous cases, it featured a diverse cast of members. There was SVE president Joaquín Astort, a Spanish immigrant who started caving as a teenager in his native Spain, and continued his hobby alongside his job as an engineer at the Caracas Metro; Francisco Herrera, an ecology researcher employed in Venezuela's premier scientific institution, the Instituto Venezolano de Investigaciones Científicas (the Venezuelan Institute of Scientific Investigations, or IVIC); Luz Rodríguez, an earthquake geologist from the Fundación Venezolana de Investigaciones Sismológicas (Venezuelan Foundation of Seismological Research, or FUNVISIS); Maribel Ramos, a biologist working on a research ecology project that Herrera directs at the IVIC; Juan Acosta, an electrician from the Metro of Caracas; Carlos Galán, a biologist working at La Sociedad de Ciencias Aranzadi (the Society of Sciences Aranzadi), a research institute in northern Spain; Galán's wife, Mariam Nieto; and myself. Ages ranged from 31 to 60. Of the group, Carlos Galán was by far the most experienced caver, particularly in this region of Venezuela, which he has been exploring since the early 1970s.

During the first four days we hiked the mountains of the Alto de la Palencia region in search for caves that had yet to be explored and surveyed.¹ This effort resulted in four new cave entries into the National Speleological Cadastre, or cave registry, that the Society has been contributing to and managing since 1967 (SVE 2003:45-49). At one of the caves, a curious geological sample and a small crab were collected as specimens. On our return to the town of Caripe, we visited a cavern that had been surveyed in the 1970s. The goal was to determine whether or not it still harbored a previously reported crab species. We carefully waded along the low water of the cave's long and narrow passage, straining our eyesight, making the best use of our flashlights and headlamps. No crabs. Had we scared them away as we invaded their otherwise peaceful home, or had the population known to exist vanished?

Asking such questions, searching for biological specimens, exploring, and surveying caves, all members of the expedition, professional scientists and non-scientists alike, *did* science. Their collaborative effort continued back in Caracas (or Spain, the case of Galán), drafting trip reports, analyzing samples, producing the final versions of the cave maps based on the survey notes. The Society's publication, the *Boletín de la Sociedad Venezolana de Espeleología* now features the results of these collaborative efforts, as it has done, to varying degrees of participation and intensity, for over 40 years (SVE 2003:45-49). While many things have changed (membership is smaller, caves explored are increasingly farther and more difficult to reach, the style of exploration is different), some constants remain: the diversity of the participants and the commitment,

¹ We were not alone. The group counted on the knowledge of expert mountain trekkers of Chaima descent who sought out caves to hunt guácharos. I will explore the relationship between the SVE and Chaima descendants in Chapter 6.

at least of a critical few, to speleology as a collective endeavor necessary to keep the publication, and thus *la Sociedad*, alive. What, precisely, fuels this project? What brings such diverse group together?

To answer these questions I suggest thinking of the production of the Society and speleological knowledge dialectically. Making sense of this dynamic relation requires attending to the specific forms this speleological knowledge took during the SVE's first years after its founding in 1967. During this time the group's key foundations were established: the creation of its *Boletín* and the definition of the national cadastre. As I will show, this publication, which contains the cadastre, is not just the material instantiation of scientific knowledge and practices. These practices, which take place in the field, in the SVE headquarters back in Caracas, and even in members' homes and restaurants, not only bring together the diverse cast of members that characterized the 2008 Monagas expedition. These practices in effect *create a space* within which an alternative mode of science is possible (or at least imagined). This is a mode of science that is collaborative and accessible (at least in theory) to anyone eager and willing to explore caves. Building on the argument of Chapter 2, this also is a space in which an alternative geography is produced and enacted that deviates from the monumentality of both sites and "Great Men of Science" traditionally celebrated in Venezuelan history of science and of the nation.

In 1989, sociologists Leigh Star and Griesemer proposed the concept of "boundary object" to help explain how actors with diverse views collaborate to produce scientific knowledge.² Boundary objects are "scientific objects which inhabit several intersecting social worlds *and* satisfy the informational requirements of each" (Leigh

² The version of the article I use here was reprinted in 1999 in *The Science Studies Reader*.

Start and Greisemer 1999[1989]:509). Similar to the case these scholars analyze (the creation of a natural history museum), the growing and increasingly diverse membership of the SVE faced the potential challenge of collaboration. In the case of the speleologists, however, I argue that the cadastre worked as a boundary object in its capacity “to inhabit several intersecting social worlds” and satisfy the informational *and experiential* sensibilities of each. This capacity is premised on the fact that the registry was a registry of cave maps. As I will explain in Chapter 4, to map a cave entails its exploration. For those committed to speleological science, a national cave registry of properly mapped caves was critical for the group’s identity as a scientific organization. For those less aligned with this scientific imperative, the production and growth of a national cave registry depended on more exploration of more caves in diverse regions of the country. I do not want to give the impression that the “scientists” cared first and foremost for maps and that the “non-scientists” were in it for the experience of exploration. Neither of these labels or descriptions fall into static categories. Arguably *all* members of the Society joined the group at least in part because of their attraction to the experience of cave exploration. However, that they did so (and as long as they did) as part of *la Sociedad*, required their commitment to each other, and thus, the national cave registry project. Moreover, and in true dialectic fashion, the systematic knowledge of the cave landscape that the cadastre afforded often made visible potential new horizons (and depths) of exploration.

The dialectic between Society and speleological knowledge in the form of the cadastre manifested itself in other ways as well. Early debates about who should manage the cadastre and how reveal efforts to better define the identity of the Society and even

establish it as national arbitrator of speleological knowledge. In some ways these efforts resemble the standardization and protocols that Leigh Star and Greisemer see critical in the process of collaboration about differently positioned actors within (and at the margins of) the natural history museum community (1999). In their case, these “methods control” tactics worked as reconciliatory tools because they focused on the how and not the more contentious and value-laden why (Leigh Star and Greisemer 1999[1989]:516). Not so in the case of establishing the cave registry standards. This is evident in debates regarding the naming of caves. As I will show, these debates sometimes resulted in divisions—not reconciliations—within Venezuela’s speleological community. Human geographer Sara Cant’s 2006 analysis of the ways British speleologists handled the pooling of speleological data during the 1930s and 1940s will serve as a counterpoint to the Venezuelan case I develop here.

My focus on the cadastre is not just about the production and definition of *la Sociedad*. The national cave registry redefined caves from iconic sites that were important for what they contained or who had visited them to regular geological phenomena added to an archive, a network of many others of their kind. Here the language of science helped redefine caves. As one SVE member emphasized, this system made all caves valuable, regardless of their size or their geological and cultural histories.

A Race to Establish a National Cave Inventory

Those who lived, in 1967, the transition from Speleology Section to Venezuelan Speleological Society recalled the extraordinary effervescence, the sense of possibility, the excitement to start anew. As noted in Chapter 2, this Society created a different kind

of space for science in Venezuela, one that involved a different relation to nature and its history. But this was not without its perils. On the one hand, the Society in many ways challenged the elitism and institutionality of traditional scientific pursuits and agendas in the country thus far. On the other, it set itself up for a difficult start. Leaving the patronage of the Venezuelan Society of Natural Sciences meant leaving behind an institution that granted national and international recognition. It meant having no physical home or publication. Moreover, precisely because the group hoped to carve an alternate and independent space by engaging in a science that was itself already at the margins, it struggled to gain a footing. Yet, from accounts of those who lived this transition, it seemed that the challenges only fueled the ambition to succeed.

These challenges had to be addressed quickly. The Society's ambition of a country-wide speleological project was not theirs alone. The once long-time director of the Speleology Section Eugenio de Bellard also harbored these aspirations. There was a race to take the lead and thus gain the upper hand as producers and arbitrators of Venezuela's speleological knowledge. At stake too was the capacity of Venezuelan speleology's participation in the growing universe of international cave science.

Among the most important challenges that the new Society faced was creating its own publication. The creation and continued production of the *Boletín de la Sociedad Venezolana de Espeleología* was from the start central to the Society's definition as a volunteer-based, collective, scientific, national endeavor. It became both currency and space to imagine and project a broader regional speleology. Its pages have featured the group's own cave science, along with research from other Latin American speleologists. Most important, the journal has been the home of the national speleological cadastre, or

cave registry, which includes maps and descriptions of most of the caves explored and surveyed in the country thus far. Most, but not all. As arbitrator of this registry, the SVE has established rules of inclusion and exclusion not recognized by everyone. A closer examination of some of the debates regarding the definition of this cadastre reveals how the exploration and knowledge of the cave landscape are intertwined with moral and ethical judgments about who and how proper speleological knowledge ought to be produced.

Prior to the 1950s, any attempts at characterizing the caves of Venezuela focused primarily on Guácharo Cave, particularly since Humboldt's 1799 visit (Urbani 1995, 2000). In 1931, Italian naturalist Pietro Gerardo Jansen published an article titled "Grotte e caverne del Venezuela" (Grottos and Caverns of Venezuela) in an Italian magazine (Urbani 1969:49-53). Two thirds of Jansen's piece is dedicated to Guácharo Cave. He ends with a tantalizing invitation:

But how many caves might Venezuela possess, with its imposing mountain ranges, caves and grottoes barely noted by some *indígena* or some lonely rancher, always frightened to enter and explore the sinister and ghostly hidden underworld? Venezuela, which is on its way to a secure economic future thanks to its government policies, which have valorized its abundant oil deposits, which its soil contains, along with its increasingly valued iron deposits, which are so important in this mechanical era, when the mayor problems of the industry are solved, it would be of great benefit to achieve greater access as well to its natural beauties... [Urbani 1969:53]

The founding in 1952 of the Speleology Section heeded Jansen's call. Already in 1953, Eugenio de Bellard traveled to Paris as the Venezuelan Society of Natural Sciences' Official Delegate to the First International Congress of Speleology. In a presentation he summarized the history of Venezuelan speleology, as well as the exploratory achievements, up to date, of the group (de Bellard 1956). He reported that the

Section had, to date, explored "117 of the 449 located caverns, in other words, a fourth of the hypogean [underground] formations noted in the index" (de Bellard 1956:29). What did this early index look like? De Bellard's contemporary Carlos Tinoco recalled that this

index ("fichero") existed and was in Eugenio de Bellard's power... we added to it the notes that we gathered [in the field], notes of [us] explorers and also hunting friends, news clippings, etc. We used [this repository] to plan outings and our results were added to it, with the drafts of maps, notes on access routes, etc. . . . When de Bellard was assigned to work in Zulia state, I kept the famous archive in the basement of the bank where I worked. When he returned, angry at us, I was surprised with the almost violent tone with which he requested the return of the catalogue, since it belonged to the Speleology Section.³ I turned it over to him immediately, and I did not hear anything again on the subject. I am not sure how useful this material . . . might have been to Eugenio for his later publications. [Tinoco, Personal Communication, May 26, 2010]

In April of 1954, the Speleology Section made a first attempt at publishing a census of Venezuelan caves. The archive continued to grow, particularly after 1965, when Juan Tronchoni directed the Section. Growing differences in leadership styles and visions between Tronchoni and de Bellard culminated in the suspension of the Speleology Section and the creation, in 1967, of the Venezuelan Speleological Society (SVE), which all of the active members of the Section joined.⁴ Two years later, de Bellard, committed to his speleological ambitions, completed his *Atlas Espeleológico de Venezuela* (Speleological Atlas of Venezuela) as a supplement of the *Boletín de la Academia de Ciencias Físicas, Matemáticas y Naturales* (Bulletin of the Academy of Physical, Mathematical, and Natural Sciences). This publication contains a listing of 989 caves, organized by state, "of which 172 have been personally explored" (de Bellard

³ De Bellard's anger stemmed from an accumulation of events that in his view had corrupted the Speleology Section and had effectively shunned his role as pioneer of Venezuelan speleology. See Chapter 2 for details on these events.

⁴ As noted in Chapter 2, de Bellard was not an active member at the time, although he remained part of the Board of Directors of the mother institution, the SVCN.

1969:8). There are no maps. As Tinoco told me, it is probable that de Bellard did not find much use in the maps of the alleged early archive to produce this *Atlas*.

By then the Venezuelan Speleological Society, just two years after its founding, had published two volumes of its independent *Boletín de la Sociedad Venezolana de Espeleología* (Bulletin of the Venezuelan Speleological Society). This publication included cave maps of a quality unmatched by anything produced by the Speleology Section under de Bellard's leadership. He must have realized this. Furthermore, acquaintances close to de Bellard have suggested that he lacked the skills to produce his own maps. Instead, he counted on the support of Ramón Hernández, who allied with him shortly after the break-up of the group in 1966, and eventually joined the new Grupo Espeleológico (Speleological Group) that de Bellard created shortly after the breakup of the Speleology Section, also under the institutional umbrella of the Venezuelan Society of Natural Sciences. Hernández was a skillful explorer and surveyor, the “Power Horse” of the group, in the words of one of his contemporaries. Together they formed, in the words of Hernández, “a symbiosis: He collaborated with me with expenses, with transportation, and I collaborated with him with photographs, with written reports, with the actual exploration” (Hernández, Interview, 2007).

A very strong friendship and mutual respect bound these two men of drastically different classes. Yet, a sense of disappointment was palpable in Hernández's voice when he described the many cave maps he produced throughout his lifetime (many of them with his brother and not de Bellard). “What happened to all of those maps?” I asked him. Hernández: “A few were published in the *Boletín de la Sociedad Venezolana de Ciencias*

Naturales (Bulletin of the Venezuelan Society of Natural Sciences) but many were not. De Bellard kept them in his files” (Hernández, Interview, 2007).

In the introduction to his *Atlas Espeleológico de Venezuela*, published in 1969, de Bellard credits the members of the Speleological Group and the Hernández brothers in particular, for their contribution (de Bellard 1969). In its introduction, he states that the publication be taken as "modest base and starting point" to a greater speleological project, one that in the future ought to include maps (de Bellard 1969:22). As it stood, his contribution included

989 caves, 30 of which include guácharos ... 38 caves contained archaeological remains, 5 caverns featured rock paintings and 3 with petroglyphs in its exteriors. 49 caves contained underground streams or rivers, while 99 grottos featured vertical development, in other words, turned out to be pits or cave/pits. We conclude by stating that 40 caves have disappeared victims of mining and progress. [de Bellard 1969:9]

Despite the use of plural pronouns in the text, this *Atlas* is an individually authored work. It was with this publication that de Bellard was granted entry as member ("miembro de número") of the Venezuela's Academy of Physical, Mathematical, and Natural Sciences.

Even with de Bellard's swift publication of his *Atlas Espeleológico de Venezuela* in 1969, the Society hardly felt out-competed. Several past and present Society members impressed upon me how the *Atlas* hardly counted as proper speleological knowledge:

“Have you seen it? It is just a list of caves. It doesn't even have maps!” one retorted.

Another, noting that de Bellard was admitted to the Academy of Physical, Mathematical, and Natural Sciences on the merit of this work, gasped, “Do you think there is a right to this?! No!” His reaction signaled both his view that de Bellard's work lacked rigor and that a national scientific academy could accept members on questionable merits.

Despite these presumed questionable merits, de Bellard benefited from being the sole author of this work. He did not have to depend on others in the process of organizing the list of caves, or putting together the draft of the document, or sending it off to the publishing house. This was not the case of the SVE. To understand the Society's efforts to define and produce the national speleological registry, we need to consider the struggles they faced to produce the *Boletín*. These struggles were (and remain) intimately tied to the group's structure (and ideal) as a collaborative project based on the volunteered hard work of its members.

Antecedents and Origins of the *Boletín de la Sociedad Venezolana de Espeleología*

I was in Venezuela during the months leading up to the publication of the *Boletín de la Sociedad Venezolana de Espeleología's* 40th anniversary volume. In the SVE's meetings on Wednesday nights, Francisco Herrera, the publication's editor at the time, repeatedly voiced concerns about the process. "Rafa, when will you finish touching up the pictures? Joaquín, we need to get together to finish the final draft of the cave maps..." What began with a list of things pending turned into a litany of grievances, expressed with an increasingly worried tone. Those of us sitting around the table were quiet as we endured a lecture on individual responsibility and commitment to the Society's creed on team effort. "This can't go on like this," Herrera stressed. "The Society is supposed to be a collaborative project. It is up to all of us to keep it alive. If we do not finalize this volume quickly, we will lose our funding, putting the publication in peril."⁵

⁵ Prior to 1993, the publication of the *Boletín* depended on donations from both public and private (mostly private) Venezuelan institutions. Tronchoni was for many years the Society member tirelessly dedicated to securing these funds. The Society's

And a publication in danger translated into a Society in danger, the life of the *Boletín* the material instantiation and pulse of the organization's being, at least to some.⁶ Yet, this concern has not been new to the group. In fact, it seems to have characterized its history and been, even, a condition for its existence. In a 1980 letter to a fellow member, SVE caver Carlos Galán expresses deep concern about the "paralysis" afflicting the SVE's publication: "If we do not publish it is a bit as if we did not exist." When Francisco Herrera joined the Society in 1986, the publication was going through yet another paralysis. "The bulletin had not been out for three years," he recalled. He immediately got involved, recognizing the importance of the journal's continuity, finally getting a volume to press, which even in normal circumstances is an extraordinary accomplishment for an organization so small and so limited in resources. In effect, it usually has been a handful of individuals who have made sure the publication's run does not end, dedicating

correspondence archive is full of his letters asking for support. Having enough money to maintain the publication was a constant preoccupation for the group. This changed (somewhat) in 1993. That year, SVE member Carlos Bosque became the *Boletín*'s editor. During the time, Bosque worked in the Commission of Biology and Agriculture of the National Council of Scientific and Technological Investigations (CONICIT). This governmental organization was founded in 1967 to promote the study and application of science and technology towards the modernization of the Venezuelan state (Texera Arnal 1983). Through this experience, Bosque learned about the possibility that the CONICIT might be able to fund the SVE's *Boletín*. To qualify, it had to meet certain criteria (for example, regularity of publication, quality of articles, etc.). Bosque led the successful effort to meet these criteria and gain CONICIT support. But as Herrera has stressed, and the discussions in many SVE meetings attest, this new source of funding is anything but stress-free. The stakes are now higher to ensure that the group not lose the CONICIT funding.

⁶ SVE member Joris Lagarde, who was member of the Society during the 1980s and 1990s, believes that the Society puts too much effort on its publication. Lagarde, who did not have an academic career, argued that some members used (or at least benefitted from) the *Boletín* as a platform to publish their own work, and thus help, even if tangentially, their own academic careers (Lagarde, Interview, January 4, 2008). This, he suggested, explains these same members' emphasis on its production and quality. Yet, Lagarde also contributed actively in the publication's production and quality, such as cave photography and graphic design.

countless hours to securing monetary and material donations, writing, editing, typesetting, drafting maps, touching up photographs, and preparing mailings.

With its 42nd volume fresh off the publishing house (as of mid 2010), and the planning of the 43rd well on its way, the group has exceeded by far expectations both from without and even within. Having its own publication always had been one of the goals of the group since its beginnings as the Speleology Section of the Venezuelan Society of Natural Sciences. Between then and 1958, the Section relied on the publication of its mother institution, the *Boletín de la Sociedad Venezolana de Ciencias Naturales* to publish reports on its activities. By 1958, the group produced its first independent journal, but could not continue its run due to lack of funding (Tronchoni 1965). In 1965, it finally produced its *Boletín Espeleológico*. By then Juan Antonio Tronchoni was director of the Section. In the introduction to the volume he notes:

During many years, it was the constant wish of the members of the Speleology Section of the Venezuelan Society of Natural Sciences to count on a publication that fulfilled the double function of allowing the fruits of our modest labor to be known both nationally and internationally, and of serving as a unifying force among the many speleological associations of the world. [Tronchoni 1965:1-2]

More critically, having its own publication granted the group greater independence to define its content and distribution. According to fellow SE-SVCN member Carlos Tinoco, this was an uphill battle, further sowing the seeds of internal discord that contributed to the group's divorce from the Venezuelan Society of Natural Sciences and the creation of the independent Venezuelan Speleological Society:

the SVCN limited us on what we could publish there [in its Bulletin], unless Eugenio [de Bellard] authorized it and that it be within the budget of the Society [SVCN]. This limited us greatly. Carlos Bordón and others always thought necessary our own bulletin for national and international dissemination. Speleology had very few friends in the [SVCN's] Directive.

It favored botanical programs over our interests and work. [Tinoco, Personal Communication, May 26, 2010]

Growing personal rivalries between Eugenio de Bellard, who also sat on the Board of Directors of the Venezuelan Society of National Sciences, and Juan Antonio Tronchoni, were inextricably linked to the internal institutional tensions that Tinoco alluded to.⁷ To Tronchoni, the group's publication ought to feature works by any of its members, regardless of their seniority within the organization, as long as they achieve a high scientific and professional standard. The second volume of the *Boletín Espeleológico*, published in 1966, features works by the newly admitted young members whose entry de Bellard was so concerned about. For example, Pérez, at the time 16 years old, authored an article on fungal infections in Venezuelan caves (Pérez 1966). The next article featured general geological principles (Alvarado Jahn 1966). Its author was long-time and senior SE-SVCN member Raul Alvarado Jahn. A note describes recently admitted high school student, Franco Urbani, as in charge of the Section's library. The pages of the *Boletín Espeleológico*, then, furthered Tronchoni's vision of speleology as a civic and nonhierarchical science that promoted youth's involvement, especially if new members brought new skills capable of furthering speleological pursuits. To de Bellard, these new members threatened the traditional order of institutional science, and therefore, his standing as founder and main promoter of speleology in Venezuela.

The same year that the Venezuelan Speleological Society was founded, its first volume of the *Boletín de la Sociedad Venezolana de Espeleología* was published. The group also relocated its equipment and collections to a rented building in Caracas. Carlos Bordón, who had been with the group since shortly after his arrival to Venezuela in 1957,

⁷ See Chapter 2.

was intimately involved with the production of the *Boletín's* first two volumes. In this, his experiences in his hometown of Trieste, Italy, were invaluable. In June 2007, I interviewed Bordón in his home in the city of Maracay, two hours west of Caracas. He had turned the basement into a personal abode, packed with books, drafting tables, expedition equipment, and mementos of over 60 years of exploration and field science both in Venezuela and all over South America, which he traveled twice with his wife Nora to collect insects. By the mid 1980s, Bordón had one of the most complete insect collections in the continent. One of the rooms in his basement contains a small sampler of the extraordinary variety of specimens that he collected, conserved, and classified (Fig. 3.1).⁸

I was born in Trieste, where speleology was also born... I was 13 or 14 years old when I made my first contact with caves. I had a friend who went frequently on cave excursions. One day he decided to explore a cave near Trieste, called Vilenica... When we arrived it was closed with a metallic door because it belonged to the municipality, which had closed it off to protect it [from vandalism] during parties. We climbed up, because it [the cave] was at the bottom of a sinkhole. We climbed up along one side, about 10 to 15 meters. There was an opening that gave us access to the cavern... [My friend] had a rope with him. He threw the rope down in there, tied it to a rock, and told me, "Look, you put on the rope like this, like this, and like this," and he threw himself in, leaving me there all alone in the darkness with that rope [laughter]. If I did not kill myself at that

⁸ Bordón's amateur dedication to entomology was unique within the Society. However, members routinely collected geological and biological specimens to analyze. Archaeological artifacts sometimes were collected as well. They published the results in the bulletin. The original idea of the SVE founders was to create a speleological museum that included field materials. This never came into fruition. Instead, the group quickly amassed a great amount of materials that they struggled to maintain in an orderly fashion in the several buildings they rented throughout the years. Once they settled, in the 1980s, in their current space (the basement of a residential building in Bello Monte, a Caracas neighborhood) this collection had become much smaller, with many items damaged, donated, or kept at the homes of members. In most cases, the individuals leading this collection, analysis, and publication of results sought (or already had) academic careers in geology, zoology, ecology, and archaeology. Thus, their individual careers often benefitted from these speleological activities.

moment that meant that I had a guardian angel who was taking care of me and kept taking care of me for 80 years. And so I went down...

It was pretty much obligatory in Trieste to go to caves, because there are so many. I think that the current cadastre has about 5,000 caves in a territory as large as the [Venezuelan] state of Aragua. That's how I started off with caves. After, I grew fond of insects... There in the caves of Trieste bioespeleology was born... [In] Postumia cave... the first blind bug was found. Completely blind, an insect, the *Leptodirus hochenwartii*, the first blind insect discovered. No one imagined that blind insects existed. Now there are 10 or 20 thousand species known, but that was the first...

When I was about 15 or 16 years old, with another friend we set up a speleology society, with its statutes, its rules, its membership card, its emblem, and with the seal sewn on the t-shirts (that was the job of our mothers). And of course, like all small groups of that time we did not respect the official cadastre, we had to have our own cadastre, assigning our own numbers to the caves, so that now in retrospect it is not possible to know which caves we visited because they did not correspond to our cadastral numbers. [The name of the group was] STS, Sociedad de Espeleología Triestina [Speleology Society of Trieste]. This group was active for 10 years, from 1938 to 1948.

When I arrived to Venezuela, after the first week of settling in, the first thing I did was find out if there were any speleologists to make contact. I found the Venezuelan Society of Natural Sciences, which had a speleology section. There I met Juan Antonio [Tronchoni], so he was the oldest friend I had in Venezuela... So I joined "the gang..." Eduardo [Schlageter], Eugenio De Bellard, Raul Alvarado Jahn, Ramón Hernández, Carlos Tinoco, Marcos Sandoval... [Bordón, Interview, June 19, 2007]

Recounting the tensions that eventually led to the end of that group and the creation of the SVE, Bordón explained that he was against this change. He stressed that the group needed a physical space to store its collected specimens and all of its equipment (otherwise, he joked, "the women would complain of all of that dirty equipment full of ticks in their homes!"). More importantly,

[the SVCN] already had a bulletin. It was easier to ask for two or three pages [of that publication] than to start a new one...⁹ When we created the

⁹ This statement appears to contradict Tinoco's statement earlier in the chapter that Bordón supported the idea of an independent publication. It is probable that Tinoco

new Society [SVE], the main problem was the bulletin... I would tell them that it is not that simple. It is not insurmountable either, but it requires a different kind of commitment ... I made the first volumes, I mean *physically* made them! [Bordón, Interview, June 19, 2007]

In a later exchange, Bordón emphasized that

everybody talked about the bulletin, but nobody wanted to get it going, it was something mysterious. Then, I convinced Juan Antonio [Tronchoni]. He had friends at the printing office of [the national newspaper] *El Nacional*, which lent us a flat-bed printing press, with movable type, that they used only sporadically for publicity posters. Also, a friend of Juan Antonio had a screen printer so he took care of the prints of pictures and maps. I had some experience [with the printing process] because in the years 1944 and 1945, in Trieste, I had organized an underground printing project in the fight against the Nazis, and we had to invent it all. [Bordón, Personal Communication, June 1, 2010]

In that first June 2007 interview, Bordón further recalled the publication of those first numbers of the *Boletín de la Sociedad Venezolana de Espeleología*:

No one knows who edited the bulletin. It was more important to show that it could be done. Otherwise how could we have done it? We would have had to hire a printing house to do it all. At least for the first 10 or 15 volumes I drew all of the final maps in the cadastre in order to show them how it had to be done... I do not want to show false pretense. The point is that by me putting together those first bulletins, everyone could see that it could be done. [Bordón, Interview, June 19, 2007]

Bordón's speleological experiences in Italy helped define the Society's scientific and professional identity. His self-taught expertise in cave biology helped establish the Society's interest in the field from early on, with Bordón promoting proper specimen collection during expeditions. Moreover, the group's first serious efforts at beginning the

referred to the later period when it was evident that depending on the SVCN to publish anything was virtually impossible.

national speleological cadastre owe it to his drafting skills. Finally, and most critically, he had the capacity to get the job done.¹⁰

Urbani recalled that Bordón had European publications that the group used as examples to follow. The Touring Club Italiano's 1926 publication *Duemila Grotte* contained cadastral elements that they aimed to emulate (Bertarelli 1926). Moreover, by the mid 1960s the Speleology Section was on the mailing list of a number of caving magazines from what Tronchoni referred to as "the world's main scientific centers," such as the American National Speleological Society's *NSS News*, *Rassegna Speleologica Italiana* (Italy), *Stalactite* (Switzerland), *Spelunca* (France), *Speleo Digest* (USA), and *Comissione Grotte Eugenio Boegan* (Trieste). To publish and circulate a Venezuelan speleological bulletin was, then, a critical step towards the group's desire, in Tronchoni's words, "to integrate itself into the present strong international current, and extract from it the greatest amount of knowledge possible" (Tronchoni 1958:2).

The First Volume

In the introduction to the first volume of the *Boletín de la Sociedad Venezolana de Espeleología*, Tronchoni thanks Dr. Raúl Valera, governor at the time of the Federal District (with Caracas as capital) for financing its production. Five hundred exemplars made it off the Central University of Venezuela Press in time to commemorate 400 years

¹⁰ Of course, he represented more. As a European immigrant to Venezuela, he shared an affinity with several other Speleology Section members, in particular Tronchoni, whose own family suffered the consequences of war in Europe. As a native of *the* original karst region of the world, Bordón linked the Section, by a degree of one, with the "birthplace of speleology." In his appreciation, these qualities granted him de Bellard's acceptance and thus entry into the Speleology Section, despite the fact that he [Bordón] was not part of the high class of Caracas.

since the founding of Caracas in 1967. This first publication established a look and feel that would hardly change for the 19 volumes that followed: with its 16 by 26 cm format, its cover featuring the Society's recently designed logo: a bat and an electron ladder inside of a double circle with a blue backdrop, the only color in the entire publication, the words "lux in tenebris" (light in the shadow) crowning the symbol. Its content has six parts: articles pertaining to "Physical Speleology," the description and maps of caves in the "Cadastre," articles on "Speleological Archaeology," followed by those on "Biospeleology," and finally, shorter sections on "Speleological News" and "Bibliographic Notes." The contributors varied from original Speleology Section members to recent newcomers, some barely out of high school.

Recent member Franco Urbani featured two articles, one on the geology of cave pit Sima del Agua Dulce, located in the town of Chichiriviche, Falcón State (Urbani 1967a), and the other a brief review of the term "speleothen," coined in 1952, to describe secondary cave formations (such as stalactites and stalagmites) (Urbani 1967b). These would be the first of numerous publications on cave geology and mineralogy that Urbani would publish in the *Boletín* and other academic journals (he eventually received a Ph.D. in geology from the University of Kentucky in the 1970s). This first volume also includes a brief description of "Cueva La Peonía," a cavern located in the region of Barbacoas, in Lara State (Rod 1967). Its original author was Emile Rod, a geologist of the Venezuelan Atlantic Refining Company who carried out geological studies of the region in 1950. The article includes the cave's description, along with graphics of the tectonics of the area, a plan (from the top) view of the cave, and another profile (from the side) view that locates its development within the geological formations of the area. This work had first

appeared in English in the *Boletín Informativo de la Asociación Venezolana de Geología, Minería y Petróleo* (Rod 1960). Urbani translated the note, explaining its potential value for future speleological exploration and research, as well as noting that this work makes Rod “pioneer in scientific speleology of the country” (Rod 1967:11). This entry also is first of many Urbani would publish on the history of cave exploration and speleology in Venezuela.

The “Physical Speleology” Section also features an article titled “Indispensable Requirements to Establish an Underground Microclimatic Station” by SVE members Raúl Alvarado Jahn and Julio Lescarboursa (both part of the “old guard,” members who had been active with the Speleology Section of the Venezuela Society of Natural Sciences and of Tronchoni’s generation) (Jahn and Lescarboursa 1967). The piece includes detailed descriptions of how to obtain measurements of temperature, pressure, relative humidity, and wind speeds, as well as two photographs of the authors (although their names are not specified in the legend) using the measuring instruments inside La Azulita Cave in Mérida State.

An analysis of archaeological remains from Lizardo Cave, also in Falcón State, is featured in the *Boletín*’s section on “Speleological Archaeology.” Oscar Garbisu and Miguel Angel Perera, both anthropology students in the Central University of Venezuela, authored the piece (Garbisu and Perera 1967). The article includes detailed descriptions of 72 pottery remains, along with diagrams of the cave floor’s stratigraphic analysis and the most peculiar painted patterns on the pieces of pottery.

Finally, Omar Linares, also a high school student and member of the La Salle Society of Natural Sciences, authored an article of the description and distribution of the

bat species *Lonchophylla robusta*, previously unknown to exist in Venezuela (Linares 1967). Linares went on to study biology at the Central University of Venezuela. A focus on Venezuelan mammals, and bats in particular, would become Linares's career specialization.

The *Boletín's* "News" section briefly summarizes the group's recent explorations, including those outside of the country, as in the case of SVE member Hellmuth Straka to Africa. It also notes the negative findings of an expedition to the Venezuelan region of Peñón de las Guacas, where its members did not find any caverns. Finally, this first volume's 64 pages closes with a brief summary of recently published speleological literature from Cuba, France, the United States, and Brazil.

Beyond its explicit functions of publication and dissemination of speleological knowledge, the *Boletín* served as a presentation and promotional piece to garner recognition of and financial support for the group's activities. To Tronchoni, who, as SVE president for a total of 20 years, the production of the *Boletín* was an enormous source of pride. SVE member Fernando Enrech emphasized the importance that the publication had for Tronchoni: "Juan Antonio was very proud [of the *Boletín*]. He, who had no high school diploma, felt a sense of fulfillment" (Enrech, Interview, January 4, 2008). In the numerous letters that Tronchoni wrote to potential public and private donors to the Society, he states including a copy of the most recent volume as material instantiation of the group's serious commitment to national speleology.

This brief exploration of the *Boletín's* history and content, at least in its early years helps bring into sharper relief the activities of the Society and the breadth of its speleological ambitions. More specifically, it sheds light on the ways caves became not

just objects of science but places *for* science. As nature's natural laboratories, their hidden archaeological remains were to be excavated, samples of their unique organisms collected and catalogued, its unique minerals studied, its geomorphology and hydrology understood and traced as part of a broader cave landscape. A cave's map would be foundation of these scientific possibilities. Thus, it was critical that these maps be well done for the subsequent science "to count." Defining the standards of cave map-making became yet another challenge during the SVE's first years. As these challenges were met, so were caves and cavers dialectically defined.

Defining Cadastral Standards, Defining Society

The cadastral elements of the Touring Club Italiano's 1926 publication *Duemila Grotte* became the standard that the Society aimed to reach and emulate (Bertarelli 1926). Caves were to be surveyed systematically, their final maps containing both plan (top-down) and profile (side views). Each cave entry also would include a description of the cavern, emphasizing its geological, hydrological, and ecological characteristics. This was to be done with *every* cave, no matter how monumental in terms of size, anything it contained, or who had visited it in the past. This amounted to a shift in how the caves of the Venezuelan subsoil were made "visible."

During the first years of the newly established group, there was a strong impetus in gaining international credibility. Making sure that foreign speleologists and cavers recognized the Society's scientific standards was key in this regard. Yet, these international standards were themselves in flux during 1960s and 1970s, with several SVE members becoming actively engaged in discussions that led to their eventual

definition.¹¹ Debates regarding the proper production and management of speleological knowledge were not the SVE's sole preoccupation within Venezuela. By the mid 1970s, there were other caving groups eager to have a say in the definition and maintenance of the national caves registry. Not only did Eugenio de Bellard create a new speleological group within the Venezuelan Society of Natural Sciences, there were other organizations springing up.

In 1975, the Centro de Exploraciones Espeleológicas or CEE (Center of Speleological Explorations) of the Universidad Simón Bolívar (Simón Bolívar University) organized the first meeting of speleological groups in the country, each represented by two members. De Bellard and Hernández were present, along with two SVE members (Franco Urbani and Miguel Angel Perera), two CEE members, and others from a group called Inter and another called Grupo Venezolano de Exploraciones Espeleológicas (Venezuelan Group of Speleological Explorations). By the end of the day-long meeting, all of those present, except de Bellard and Hernández, agreed to continue using the SVE's cave nomenclature it had been using thus far (state initials followed by the number of the entry in that state). They also agreed to the renamed Speleological Cadastre of Venezuela published in the SVE's *Boletín*. This was not acceptable to de Bellard and Hernández. They would continue cataloguing the caves they explored and surveyed using their own naming and indexing conventions that de Bellard established in his *Atlas*. Acknowledging the previous contentious history between de Bellard and the now well-established and growing Venezuelan Speleological Society, it is likely that in

¹¹ Franco Urbani exchanged several letters with French speleologist Claude Chabert on these topics, complete with hand-drawn graphics that illustrate their points. Chabert went on to become an important international expert on cave surveying and mapping (Chabert and Watson 1981).

part he rejected the idea of having the caves explored by his new group published in the pages of the rival organization. It may not have mattered how open and collaborative the SVE emphasized the cadastre to be. It may not have mattered that each cave entry lists the group and individuals involved in its survey. To see one's cave maps published by the SVE is at minimum to tacitly acknowledge and contribute to the SVE's success as arbitrators of the nation's speleological knowledge. I will return to this point further on.

Also during this meeting, the groups agreed on a new cadastral entry and survey standard by which cave submissions would be judged (SVE 1975:105-108). These standards also would impact how surveyors would work in the field, acknowledging that certain practices would be necessary to ensure the final quality of the cave map. Each cave entry would include the name of the karst region where it is located, its geographical coordinates, the net vertical displacement of the cavern (the difference between the highest and lowest points), and the quality of the survey.

The survey quality criteria were adopted from the British Cave Research Association (BCRA).¹² These criteria require that each survey be graded with two values. The first is a number from 1 to 6 corresponding to the degree of accuracy of a cave's line plot. The line plot is a scaled two-dimensional image representing the length, horizontal orientation, and vertical displacement of cave passages (Fig. 3.2).¹³ Based on these standards, a sketch done with no measurement tools would be assigned a "1" and a plot done with both compass and clinometer with minimal range of error a "6." The second BCRA value is a letter designating the degree of detail, such as form and size of galleries,

¹² This is the very organization that had gone through major transformations, starting in the 1930s, as it faced the challenge of pooling and coordinating cave surveys done by groups of different regions (Cant 2006:785).

¹³ Chapter 4 describes the production of a cave survey in detail.

whether or not they contain different formations, etc. An “A” would correspond to detail drawn by memory, while a “D” suggests a high degree of detail, its precise location carefully marked in the survey constructed *while in the cave*. Both the line plot and detail criteria are related, since the degree of detail within the cave depends on the quality of the line plot.

The caving groups present at the 1975 meeting finally agreed that the Speleological Cadastre of Venezuela would only list caves with a minimum BCRA degree of 3B, with a “3” requiring that

the line plot be done with a compass, with the horizontal and vertical angles are measured [with an error] of ± 2.5 degrees, with distances measured within ± 50 cm, and survey station positions have an error within ± 50 cm. [SVE 1975:107]

Further, the “B” value suggests that at minimum, “all details of the galleries are estimated, but noted inside of the cave” (SVE 1975:107). There was an additional criteria that the groups agreed on, and that was the line plot precision (*relación de precisión*), which requires that the plot “link and close up” when galleries within the cave actually interconnect.

These new cave mapping standards had implications not just on whether or not, where, and how their maps were published, but also on dynamics in the field. They required that cave explorers work in teams with the necessary skills and tools to produce an accurate line plot. As will become clear in my description of these dynamics in the coming chapter, then, these cave mapping standards affected not just the ways caves were represented, but also how they were *experienced*. They also had implications on the ways cave groups organized and trained new members.

Newcomers to caving usually gained cave surveying skills by joining more expert cavers along in expeditions, but the need for more formal instruction often came up. To address this, the SVE attempted at times to organize speleology courses that included survey and cartography. Juan Antonio Tronchoni strongly encouraged this. He cautioned against increasingly closed cliques within the SVE. This point, which echoes Asó's concern, illustrates a tension in the role of friendships in scientific pursuits. While friends working together might be able to trust one another and count on each other's commitment and dedication to their common pursuit, their very friendships might discourage the entry and acceptance of new members. And for a group so small that depends on volunteer work, having no new members might spell its death.

Tronchoni was constantly prodding the more expert members to bring in new members, particularly young ones from universities, and to teach them the skills they possessed (Galán and Perera 2006). But doing so translated into a greater demand on the time of already busy individuals who doing speleology in their limited free time beyond their more formal careers. This is a contentious topic that has never left the SVE, one that Tronchoni never satisfactorily saw resolved in his lifetime.¹⁴

¹⁴ The way Maribel Ramos joined the group in the mid 2000s illustrates the complexity of this issue (Ramos, Interview, April 15, 2008). She described how long-time SVE member Francisco Herrera encouraged her to become a member. She had been working with him on a project at the Ecology Department of the Venezuelan Institute of Scientific Investigations (IVIC). When she applied for the position at the IVIC, Herrera took note of her interest in speleology that she listed in her curriculum vitae. As a student she had been a member of the Central University of Venezuela's speleology and outdoors club, Universidad Central de Venezuela's Centro de Exploraciones e Investigaciones de Campo (UCV-CEIC). In her view, Herrera probably vetted her as a valuable new member for the SVE and thus encouraged her. She explained to me that something similar may have happened to Luz Rodríguez, also a recent SVE member. In her case, Franco Urbani did the vetting and encouraging. He came to know Rodríguez from his position as a senior geologist at Fundación Venezolana de Investigaciones Sismológicas (Venezuelan

Despite stressing the collaborative quality of the Speleological Cadastre of Venezuela, in practice the SVE emerged as the arbitrator of speleological knowledge. In part, this was understandable, since the group counted with members with over 2 decades of experience exploring and surveying caves. Also, the group benefited from membership continuity that other newer organizations could not count on. This was especially true for university groups, whose members come and go as they start their programs and then graduate. But as arbitrator the SVE gained a reputation among some up and coming caving groups as too demanding, as critically destructive, and even as wanting to monopolize the cadastre.

To former SVE member Pedro Aso, these critiques were not totally unfounded. To him, they were evidence that the “organization had begun to eat up the movement” (Aso, Interview, August 21, 2007). Aso joined the SVE in 1967, just when he had finished high school. Describing it as an “unforgettable experience,” Aso recounted his first caving outings with his friends Carlos Todd and Freddy Vera in the east of Caracas. He joined the Society on several weekend trips to Guácharo Cave. He never met de Bellard, but lamented the split of the Speleology Section group. “I don’t believe in divisions, but I do support the growth of more groups.” He eventually pursued a

Foundation of Seismological Research, or FUNVISIS). To Maribel, it seemed as if new members to the SVE mostly relied on *apadrinaje* (“godfathered” relations) to enter. Otherwise, the group appears to the outsider as very closed. I commented this apparent phenomenon to my father, who answered: “That is really regrettable. That is precisely what Juan Antonio [Tronchoni] was against, since it goes against his ideal of an open Society” (Pérez, Personal Communication, 2011). And yet, from the perspective of Herrera and Urbani, two of the most dedicated and multifaceted members of the Society, whose years of commitment have sometimes—almost single-handedly—made sure that the *Boletín* makes it to press, their encouragement and support of Ramos and Rodríguez must be understood. Nor does this encouragement necessarily mean that others might not join in other ways (for example, reading the *Boletín* and independently contacting the Society).

scientific career and is now a professor of biology at Simón Bolívar University. Deeply committed to the promotion of science among youth by exposing them to fieldwork, he has at times mentored the student speleology group at his university (the CEE). He took on this role after he had stopped caving himself. Even as SVE member, however, he had difficulty fitting in, finding some of the tightly-knit cliques within the group almost impenetrable. Regardless, the Society's leadership under Juan Antonio Tronchoni promoted, although not without difficulties, openness, inclusiveness, recruitment.¹⁵ Aso:

Juan always stressed the need for social gatherings, such as Christmas parties, in order to increase the camaraderie among all members of the organization. He would get angry if people didn't come. Juan saw this and acted on this. He could befriend stones. [Aso, Interview, August 21, 2007]

Efforts to bring together different caving groups under the umbrella of the Speleological Cadastre of Venezuela appeared, at first, as a perfect opportunity to promote coordination and unity, both for the sake of speleological knowledge and its practitioners. By having SVE expert members mentor explorers and surveyors on map-making techniques could also address one of Tronchoni's biggest concerns: the need to interest and train young university students on speleological techniques. This also could work as a recruitment strategy. But as Aso noted, this vision was problematic since the Society "was competing with university groups for members. It might be fine if the Society recruits in universities with no speleology group, but not in a place like Simón Bolívar University [that had a caving group]" (Aso, Interview, September 4, 2007). Had the SVE become a coordinating body among regional caving groups in the country and

¹⁵ Many of these dynamics play out along the science versus sport divide that characterizes speleology. I return to this topic in Chapter 6.

not become involved in exploration and surveying itself, the geography of interests, of questions of authorship, and of identity might have been less jagged, less fractured.¹⁶

Just as some within the SVE shared Tronchoni's concern for openness and recruitment, others focused on the shared desire to see the SVE grow as a reputable *scientific* organization. This required, in their view, increasing the standards of the speleological knowledge produced and published in the group's journal. On this count, the criteria of inclusion and exclusion of maps within the cadastre became not just a scientific but also a moral jousting ground. And with the resources of time and effort by already over-committed SVE members stretched thin, adding the need to teach and critique the work of other cavers became overbearing to some. I brought this up with Rafael Carreño, an SVE member since the 1980s, and a skillful surveyor and mapper. In his view, the indictment of the SVE as an overly critical organization is not fair, stressing that SVE members like himself eagerly have helped many with their survey and mapping skills. Yet, he emphasized that they can only do this so many times before realizing that their efforts are being wasted and even openly disregarded. Patience starts to run thin.

We Came Together at the Map: The Cadastre as a Boundary Object

So far I have provided a sketch of some of the challenges that the SVE faced immediately after its founding in 1967. I have focused on the efforts to establish its publication, the *Boletín de la Sociedad Venezolana de Espeleología*. I have noted that this publication was critical on many counts. In particular, it was critical as the space where the SVE's national cave registry could be published. I also have suggested that we consider the

¹⁶ This is precisely what plagued the British Caving Association (founded in 1935) that Cant analyzes (2006). I describe this situation below.

creation of this cadastre in dialectic with the creation of the Society. This is true on two fronts: the internal one among the Society's very diverse members, but also the external one, as the Society defined itself among other speleological actors in the country, and eventually, the international speleological community.

Internally, I argue that the cadastre worked as a boundary object bringing people from diverse social worlds together in a common task. Leigh Star and Griesemer introduced the concept of "boundary object" in the late 1980s to help address a "central tension" in science: the fact that scientific work requires cooperation among differing viewpoints (1999[1989]:505). They illustrate the problems of this tension in their case study of a research natural history museum in California. As they note,

[t]he work at the museum, like that of scientific establishments everywhere, encompassed a range of different visions stemming from the intersection of social worlds. These included amateur naturalists, professional biologists, the general public, philanthropists, conservationists, university administrators, preparators and taxidermists, and even the animals which became specimens. [Leigh Star and Greisemer 1999[1989]:510]

The authors propose two strategies that help bridge these social worlds and coordinate the production of scientific knowledge: the creation of boundary objects and methods standardization. Here I focus on boundary objects.

Boundary objects are

those scientific objects which both inhabit several intersecting social worlds *and* satisfy the informational requirements of each. Boundary objects are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. They may be abstract or concrete. They have different social meanings in different social worlds but their structure is common enough to more than one world to make them recognizable means of translation. [Leigh Star and Greisemer 1999[1989]:509]

For example, a “species” is a boundary object that illustrates the power of an “ideal type,” an object that provides a general blueprint of a kind without getting into the specifics of any one instantiation of its type (Leigh Start and Greisemer 1999[1989]:518). Another example is the state of California (as a concept, as a physical space, and as a representation in maps). To the museum’s key patron, the goal of preserving what she saw as California’s distinct nature was very important. For the museum’s main scientist, focusing on the state of California helped delimit and focus his ecological vision (and practice) of natural history. The California *map* worked as a boundary object in its capacity to emphasize the activities of different actors: the roadmaps and campsites of species collectors, the “life zones” inhabited by distinct flora and fauna, and the ecological regions that the naturalists needed described and linked to the collected samples (Leigh Start and Greisemer 1999[1989]:518-519).

In the case of the speleologists, I argue that the cadastre worked as a boundary object in its capacity “to inhabit several intersecting social worlds” and satisfy the informational *and experiential* sensibilities of each. This capacity is premised on the fact that the registry was a registry of *cave maps*. As I will explain in detail in chapter 4, to map a cave entails its exploration. Moreover, cave mapping requires teamwork. Thus expeditions must count on participants who together share the commitment and have the skills necessary to get the work done. This commitment includes making sure members follow through with their intention of joining an expedition, not a trivial issue! These skills involve the physical and technical capacity to traverse the cave landscape. The preparation for the 2008 Alto de la Palencia expedition is a case in point. In a planning meeting, Francisco Herrera and Carlos Galán voiced their concern that everyone be in

good physical shape and that we pack only what was necessary in our bags. This was important since much mountain hiking was going to be necessary to *get* to the caves in the first place. The more experienced participants (Herrera, Galán, and Astort) made sure their climbing equipment was in order, since they would have to form the exploration and survey team of vertical caves that required technical rope work to get inside (rappelling in and ascending out). Most critically, Herrera and Galán made sure their survey equipment was complete and in order (their compass, inclinometer, and measuring tape, along with field notebooks and pencils). Although the rest of us were not as experienced, our participation meant there were more able bodies to help carry the equipment along the hike. Moreover, no one knew what kind of cave (or how many) we might find. If we encountered caverns with extensive walking passage, those of us without technical climbing abilities might focus on surveying those, while the more expert members focused their efforts elsewhere. Finally, our participation was part of a socialization process into the practices of the Society, as well as to the introduction of a cave landscape that had been the focus of the group for over 4 decades.

Regardless of expertise or scientific training, what brought all of us together was the desire to participate in the exploration to/of caves. The fact that this was not just a leisure pursuit, that its expressed aim was to find new caves, to map them, and to add them to the national speleological cadastre, guaranteed the participation and dedication of members such as Galán and Herrera. In turn, this aim increased our commitment to *explore* fully, or at least, as fully as possible. This meant both setting our pace so as to reach as many caves as possible and rigorously exploring the *insides* of caves so as to produce as “complete” a map as possible. In the case of the third cave surveyed during

the expedition, Ramos's commitment to squirm as far as possible down a black hole on the side of a pit appealed both to her desire to explore caverns *and* to gather as much information as possible that would eventually be used to produce their representation. It also consisted of a performance of sorts, a performance to her expedition team that waited along the rim of the pit and counted on her willingness and capacity to "push passages."

Even before traveling out east, we had talked among us about who would be responsible to produce the trip report. We agreed that Rodríguez, Ramos, Acosta, and I would work on it together. Thus, all of us took notes during the expedition. Acosta in particular appeared quite honored to take on this responsibility. As the one with the least formal education among us, he embraced the opportunity to do science. Most of all, he told me during an evening chat at camp, he loved being outdoors. The participation of each and every one of us contributed to the completeness and quality of the information that would eventually make the cadastre grow. And the commitment to make the cadastre grow ensured that all of us experienced the cave landscape, at least to the degree that our capacities allowed. In this sense, the cadastre worked as a boundary object in its capacity "to inhabit several intersecting social worlds" and satisfy the informational *and experiential* sensibilities of each.

I first began to think of the cadastre as a boundary object after my interview with SVE member Pedro Aso, whom I have already introduced. He offered his perspective on the sociology of the Society, noting three groups: the scientists, the non-scientific but career-oriented members, and the misfits. He stressed that even though it was mainly (but not exclusively) the scientists who were most committed to the regularity and quality of

the registry's publication, everyone in one way or other contributed to the enterprise. In his words, "We came together at the map." Precisely *how* members "came together at the map" requires attending to the practice of speleological science, both in the field and beyond. As will become clear in the coming chapters, this practice entails collaboration that brings together the scientific and sporting aspects of the pursuit. I propose thinking beyond the map itself to the cadastre in explaining how people with diverse interests came together. With the cadastre, the Society made a commitment to a nation-wide pursuit. To the non-scientist attracted first and foremost to exploration, this translated into the potential for participating in many expeditions to diverse regions of the country. The national scope of the project also ensured (and promoted) the authority of the Society as the country's leading speleological organization.

Moreover, the systematic knowledge of the cave landscape that the cadastre afforded often made visible potential new horizons (and depths) of exploration. For example, as more caves were located and explored in Zulia state, in the northwest part of the country, a fuller picture of the cave landscape was constructed. This "picture" suggested the potential size and location of the limestone outcrops. This information, together with state satellite images showing the disappearance of rivers from the surface, led to the location and exploration of what is now Venezuela's longest cavern, El Samán Cave (SVE 1996).

The Cadastre as Methods Control

The debates I have already addressed regarding the management and standards of the national registry also illustrate what Leigh Star and Greisemer describe as methods

control or standardization. Methods control involves the creation of protocols that help coordinate the activities of many actors by channeling them towards a common result (Leigh Star and Greisemer 1999[1989]:516). In Leigh Star and Greisemer's case, this common result involved the creation and maintenance of the research natural history museum. For example, the main scientist succeeded in drafting very specific rules on how to gather samples from the field. These instructions were fastidious but simple to follow, even for the amateur. By emphasizing the *how* over the *why*, these methods avoided galvanizing actors with diverse agendas (Leigh Star and Greisemer 1999[1989]:516).

We can think of the criteria defined in the 1975 meeting among speleological groups described above as an effort towards establishing methods control. There are some important differences between the natural history museum case and my own, however. While the agreement to adopt the British survey standards united several actors in a common pursuit (the pursuit of speleological practice that met some international, third party standard), the fact that the SVE would be the final *judge* of whether or not these standards were met galvanized some actors.¹⁷ This issue was compounded by the fact that the results would be published in the SVE's publication. While most players in that 1975 meeting agreed that the SVE's *Boletín* would be the best place to publish the new additions to the cadastre, to some (e.g., to de Bellard and Hernández described above) this arrangement felt like giving up the authorship and control of their speleological data to another party (and in this case, a party with a history of personal

¹⁷ I will not offer here a detailed discussion of how a third party might judge the accuracy of a cave map. Suffice it to say the SVE members would not go to a cave with the map in hand to "check" for inaccuracies. Instead, it would have to rely on

antagonisms). Moreover, it is clear that the discussion regarding speleological standardization did not separate the *how* from the *why* that Leigh Star and Greisemer point to as a key aspect of methods control as a tool towards collaboration (1999:516).

This is evident in the SVE's summary statement of the meeting:

The work that different authors have done so far on the matter was considered with great precision and detail, giving it its deserved value and merit, *always with the tone of depersonalizing this work, of not making it individual patrimony* but of judging it using an agreed upon standard of reason by all of the members present, an unwavering and basic standard of reason upon which to build on a work that grows in quantity and quality with greater accuracy and methodological validity. [SVE 1975:1, emphasis added]

In her analysis of the creation and eventual transformation of the British Caving Association (BCA), human geographer Sarah Cant notes that one of the points of tension revolved around the “records” (2006:783-784). This case has interesting similarities and contrasts to the ways the cadastre both united and divided Venezuelan speleological actors. The founders of the BCA in 1935 aimed to create an umbrella group to the many smaller regional caving clubs already active in Britain. As such, the BCA would raise the status of speleology at the national level. This goal involved creating a centralized archive of national speleological knowledge—its version of the Venezuelan cadastre.

Eli Simpson, one of the main proponents of the BSA, was appointed to manage the “records.” Simpson was not a career scientist. He was, however, an avid explorer, and also a strong personality. With this point Cant emphasizes the role of “personal geographies” in the shaping of British speleologies (2006:776). Simpson's view of speleology was evident in the ways he approached the records, which were a collection of notebooks with glued newspaper clippings, survey notes, maps, pictures, etc. These materials were not standardized or systematic in any way (or at least not in the way the

more scientifically-minded members hoped). Still, Simpson expected that BSA members (representatives of other caving groups) would contribute notes, surveys, and maps of caves explored in their region in order to build a more systematic central database of national scope. Few did. As Cant notes, Simpson's relation to the records was viewed as one of personal management and possession. To contribute information to the records was equated to giving up regional information that could be exploited not by an organization that represented all, but by an individual with personal speleological ambitions. In this sense, Simpson, and the BSA, were seen as rivals to other regional groups. Three years since its founding, the BSA began to lose membership (Cant 2006:784). Despite this and other problems, Simpson kept the BSA active, although greatly diminished in scope. By 1947 a new group, which did not include Simpson, was created. The Cave Research Group (CRG) pooled together the more "scientifically-inclined" cavers in the nation. Again, they aimed to create a national coordinating body. Unlike the BSA, however, they made sure that this group did not compete with the regional groups. Unlike Simpson, it did not coordinate its own explorations or make its own discoveries. The authorship of data contributed to the new national archive would remain with the regional group that explored and surveyed caves.¹⁸

I bring up the BSA records case to stress some of the complications related to the pooling of speleological knowledge even as efforts are made at methods control. While I have argued that the cadastre worked as a boundary object capable of bringing together

¹⁸ In 1973, the British Speleological Association and the Cave Research Group of Great Britain became one, forming the British Cave Research Association (the group that developed the survey standards that the Venezuelan speleological groups adopted in 1975). As Cant notes, "[t]he CRG and BSA's interests overlapped so much, that finally, speleologists realised they were all practising speleology" (2006:789).

diverse actors *within* the Venezuelan Speleological Society, among them there was no competition to individually discover and author cave maps. While cadastral entries *do* list the names of those involved in a specific cave's exploration and survey, the enterprise is seen as a collective endeavor, they remain the work of *la Sociedad*.¹⁹ Moreover, results are published in the group's *Boletín*, and thus become "open knowledge" instead of the personal property of any one individual. Let's recall the way the earlier Speleology Section managed its information. While technically "of the group," Speleology Section founder and long-time director Eugenio de Bellard controlled the group's archive in ways that were perceived as non-collaborative (not unlike Eli Simpson in the BSA case). This arrangement, however, might have suited the organization's historical structure just fine (at least for a while), a structure that honored the leadership of its founders.

This situation contrasted with the SVE's collaborative vision. This vision, it seems, worked as a filter of the organization's membership. Joining and staying in the group usually worked for those *already* comfortable with the team-oriented nature of discovery and authorship, regardless of seniority. As an SVE member once told me, "There is no space here for big egos." Which is not to say that individuals with strong personalities did not exist within the organization. However, regardless of these "personal geographies" that in the case of the BSA caused frictions and divisions, SVE members ultimately worked together. That is, they explored and mapped caves as a group (although not always *literally* together, not all expeditions included *all* Society members).

¹⁹ This contrasts to scientific research papers, also published in the *Boletín de la Sociedad Venezolana de Espeleología*. For example, the papers that resulted from the specimen collections that occurred during the 2008 expedition to Monagas are individually authored works. However, they are typically seen as contributing to the collective project, since without papers the publication would fold. See Note 6 in this chapter for a dissenting view.

The cadastre was the material instantiation of their pooled efforts. It was also the material instantiation of countless trips together to all corners of the Venezuelan territory during which friendships were forged as they experienced the cave landscape as a group. This contrasts to both the BSA and CRG cases noted above.

When new speleological groups formed in Venezuela, however, the question of how to manage national speleological knowledge emerged. In contrast to the British case, no single organization claimed to represent or coordinate the rest. By 1975 many members of the SVE had been exploring and surveying caves together for over a decade. They were not going to give this up. Also by this year the SVE had already published 10 volumes of its bulletin. By then, its cadastre included entries of almost 200 caves. Moreover, no other group had a publication with the circulation and international recognition that the SVE *Boletín* had already achieved. Pragmatically, the groups present at the meeting had little option as to where the national speleological cadastre would be published. Efforts were made to emphasize that even though the *Boletín* would house the cadastre, each group would remain author of their work. Indeed, since that meeting, the first page of the cadastre included the logos of the participating speleological organizations. The names of the specific explorers and surveyors, along with their organizational affiliation, are listed with each cave entry.

But as de Bellard and Hernandez's decision to opt out of this collaborative project attests, it was very difficult to separate the how from the why in the proposals to standardize national speleological knowledge. As I have noted, this was because *where* the results of these standardized results would be published was tainted with personal

rivalries. This issue limited the capacity of methods control to coordinate scientific knowledge among diverse actors.

The blurring between the how and the why in terms of methods control also is evident in the case of cave naming. In 1975 Venezuelan explorer Charles Brewer accused the SVE's president Juan Antonio Tronchoni of committing "scientific injustice" (Brewer 1975:1). In a letter to Tronchoni, he contends that his speleological achievements were not properly acknowledged in articles on caves in quartzite rock published in the Society's bulletin and elsewhere.²⁰ In 1971, Brewer organized an expedition that pioneered quartzite cave exploration after reaching by helicopter the top of Autana tepuy and then descending along the mountain's vertical wall to the cavern contained therein. He also organized another expedition that explored two vertical pits on Sarisariñama mountain.

Brewer's accusation focused on the two Sarisariñana pits, which he explored in early 1974. He was not alone in this expedition, nor was he the first to sight these geological formations. Beginning in 1970 air reconnaissance missions by geologists of CODESUR, a state-sponsored project to develop southern Venezuela, had already spotted these pits.²¹ Autana's cavern, which crisscrosses the mountain from one end to the other, also had been spotted. One of these geologists, who was an SVE corresponding member,

²⁰ At the time, Venezuelan speleology was drawing the attention of the international caving community. Geological finds in the country's southeastern region challenged the prevailing view that karst was a phenomenon unique to carbonic rock (Ray 1997). In fact, this region's table mountains contain caverns with major development (long passages) resulting from the same dissolutional processes in quartzite that produce most caves in more soluble limestone. They just needed much more time, something they have had to spare in this ancient geomorphological landscape (Wray 2010).

²¹ See Reig 2006/2007 on the views of nature implicated in the modernization of southern Venezuela in the 1950s.

alerted the group of these tantalizing leads. This information prompted over two-dozen expeditions to the area.

Among Brewer's accusations was that a research article published in the SVE's bulletin in 1974 about karst in Venezuela's quartzite did not mention his exploration that same year (Brewer 1975:2; Urbani and Szczerban 1974:27-54). To this Tronchoni responded that in fact the publication's editor (not Tronchoni) had received the article's manuscript by the end of 1973, several months before the aforementioned expedition (Tronchoni 1976:2). On a different 1973 article on Autana's cavern, Brewer repeats the charge of omission, adding that the author himself did not enter the cave and based his observations on those who *did*, namely, Brewer and his two National Geographic companions. Yet, the article's author *does* acknowledge his exploration by name (along with two American explorers of the National Geographic Society) in two photographic legends and in the acknowledgments (Colvee 1973:7, 11). That Brewer's name did not appear in the work's main text was, according to Tronchoni, the author's decision and not that of the SVE bulletin's editor (and certainly not his own). To this point he adds:

No text of a scientific article of any scientific magazine in the world leaves room for references of personal achievements nor heroic or valorous gestures. Humility and modesty characterize scientific work. [The reporting of] those epic gestures are left for weekly magazines or periodicals with which you so skillfully deal with. [Tronchoni 1976:2-3]

Again, we see the SVE argue that scientific practice is about both the *how* and the *why*.

With this statement Tronchoni further defines the group's scientific *and* moral identity in contrast to that of other actors. Within the Society, members who already identified with this vision applauded Tronchoni's intervention, promoting further internal unity. Again,

this illustrates the dialectic between the production of scientific knowledge and *la Sociedad*.

In fact, Colvee included a graphic of the Autana Cave in hopes that it would be published along with the article. The SVE bulletin's editor rejected the graphic, since he judged it as lacking scientific rigor. One member of the SVE eventually participated in an expedition to Autana, reached the cave by climbing the walls of the table mountain from its base, and surveyed the cavern. In the Speleological Cadastre of Venezuela, Autana Cave is Am. 11 (SVE 1976).

Throughout his letter, Brewer insists on calling the two Sarisariñama pits by the name of Brewer and Gibson. He contends he has the right to name them as he wishes since he was the first to explore them. Eugenio de Bellard also suggested names for these pits, Martel and Humboldt respectively (Urbani, Personal Communication, December 1, 2011)²². Brewer rejected this as an “arbitrary” gesture, since de Bellard “did not participate in their exploration” (Brewer 1975:1). Tronchoni qualifies as “sterile and inconsequential” both Brewer and de Bellard’s jousting on the naming of these pits. Brewer’s position, opines Tronchoni, “is less altruistic than Dr. De Bellard’s, who suggests naming these natural phenomena after imminent naturalists [as opposed to naming them after himself]” (Tronchoni 1976:4).

Venezuela’s efforts to establish toponimic guidelines began in 1967 with the country’s participation in the First United Nations Conference dedicated to normalizing geographical names. Also in 1967 Venezuela’s National Cartographic Office established the Geographic Names Section, in charge of investigating the matter. By 1970, this

²² In fact, since 1995 the SVE has recognized de Bellard’s suggested names as alternatives names to these pits (Urbani, Personal Communication, December 1, 2011).

Section had proposed a draft of a law on the matter. In his letter to Brewer, Tronchoni cites from this draft:

The change of already existing geographic names and urban nomenclature is prohibited. . . . In the case of using geographic names after those of people, it is required that (a) fifteen years go by after the death of the person in question, [and] (b) a favorable pronouncement only follows to acknowledge the merits of such person, in particular those accrued through services made to the collective. [Tronchoni 1976:6]

The SVE refers to these pits as Minor and Major Pits of Sarisariñama (Simas Menor y Mayor de Sarisariñama).²³

In a 2007 interview in his home in Caracas, Brewer again emphasized the right of explorers to name their discoveries (Brewer, Interview, May 31, 2007). He insisted that even the SVE is not consistent on the matter. He cited the naming of a cave in Zulia state after SVE member Francisco Zea. Yet, this is precisely a case that Tronchoni refers to in his 1976 letter to Brewer as acknowledgement of the group's past (prior to an established legal framework on the matter) inconsistencies. The SVE claims discovery of a cave it explored and surveyed in the region of Guasare in northwestern Venezuela in 1973 (SVE 1973). It decided to name it Francisco Zea in honor of a fellow member who had died in a helicopter accident while working as a fireman during a rescue operation in Apure state. "In other words," adds Tronchoni, "serving the collective" (1976:6).²⁴

²³ In 1985 the SVE reconsidered its position and changed the names to *Sima Mayor de Sarisariñama* or *Humboldt* and *Sima Menor de Sarisariñama* or *Martel* (Urbani, Personal Communication, December 15, 2011).

²⁴ Interestingly, the members of the expedition to this cave originally wanted to name the cave after a nearby town. Tronchoni suggested, however, using a name that resonated with the metropolitan population both of Zulia state and Caracas more broadly. He saw this as an opportunity to use naming strategically to raise the national awareness of caves (and the SVE's project). In this sense, Tronchoni was not unlike de Bellard, who treated caves worthy of iconic and monumental status. Still, and in radical contrast to de Bellard, Tronchoni accepted the arguments of the younger expedition members. Upon the death of

This exchange between Brewer and Tronchoni underscores the personal and ethical dimensions of exploratory practice that bear on the ways speleological knowledge is produced. The values that Tronchoni trumpets as defining the SVE as a collective, humble, and scientific effort echo the very themes that pervade the origin myth of the Society itself, when, in 1967, its active members left behind the institutional umbrella of the Venezuelan Society of Natural Sciences and created their own group.²⁵ For most of those older members who lived the 1967 transition, but even to those who came after, de Bellard represented egoism, aristocracy, elitism. Yet, in retrospect some understand de Bellard as "a man of his time," who, as many other elite men in Venezuela, honored seniority, particularly in a hierarchical and elitist organization such as the Venezuelan Society of Natural Sciences. Beyond (or perhaps because of this) what many SVE members regard as de Bellard's most problematic flaw was, in their view, his lack of scientific rigor. Recounting an episode that has become part of SVE lore, de Bellard contemporary Antonio de la Rosa recalls how de Bellard could not accept that part of his survey of Guácharo Cave was faulty:

He wouldn't accept it. He told me that I was a nihilist, a word I had to look up in a dictionary after our meeting. I then learned that it meant that I did not believe in anything. That I did not believe in *him*. That was part of his weakness, de Bellard believed *he* was speleology. [de la Rosa, Interview, September 18, 2007]

SVE member Francisco Zea died, the group agreed to name the cavern in his honor given the criteria that Tronchoni presents to Brewer (Urbani, Personal Communication, October 21, 2011).

²⁵ The term "origin myth" is not meant to suggest that the stories of this transformation are in any way false. Rather, it is meant to emphasize how central such stories have become in defining the very identity of the group, its members, its activities, and even, both the reach and limits of the knowledge they produce (Yanagisako 2002:39).

The shared antipathy among many past and present SVE members towards Brewer is even greater. For sure, Brewer remains an active explorer, still coordinating expeditions, with his most recent efforts again focusing on quartzite caves in southern Venezuela. A 2006 *New York Times* article features him as "an explorer, if such a profession can still be said to exist, in the tradition of his Victorian forebears" (Romero 2006). This is an identity that Brewer embraces, stating that "[m]y game is to discover" and routinely garners inspiration from reading travel accounts of European discoverers (Romero 2006).

Much like his *New York Times* interviewer, I was both perplexed and intrigued by Brewer's unabashed view of himself as "explorer," as a man born and raised as part of Venezuela's oligarchy. "I am for an oligarchy, an oligarchy of the well prepared," he stated, professing profound disdain towards Chávez (Romero 2006).

Ironically, both de Bellard and Brewer share in their desire and capacity to communicate their achievements through popular media. Eugenio de Bellard wrote many articles in newspapers and more exclusive publications that counted on an elite readership extolling the virtues of the nation's underground patrimony and the sense of wonder and adventure that characterizes speleological exploration. His narratives emphasized moments and protagonists of discovery, their adventurous qualities sometimes echoing religious symbolism. Brewer remains a formidable promoter of his pursuits whether with large format photography books, lectures, or film.

In their performative style of depicting and narrating their achievements as explorers, de Bellard and Brewer illustrate the seemingly "Western" attitude towards adventure (Rubenstein 2006:237). This attitude depicts the "conquering" adventurer who

is protagonist of his travails and his narration. In away, this performance through narrative is a critical constituting part of the adventure itself.²⁶

My third point, then, is to call attention to the way that difference in the amounts of narration signal different dynamics between what Simmel referred to as conquest and self-abandonment. By narrating their stories of head-hunting while representing vision quests in ways that resist narration, Shuar subordinate conquest to self-abandonment. Westerners, conversely, narrated their stories in ways that subordinate self-abandonment to conquest." As a whole, members of the SVE wholeheartedly reject such narrative style. But beyond style, this rejection marks an effort to make more "scientific," more "objective," the results of speleological inquiry. Moreover, this shuns any references that would make monumental either the place or the players implicated in its practice. This has consequences on the ways caves themselves were conceptualized and valued.

Valuing Caves

Alasdair Kennedy recounts the formative years between 1688 and 1708 when naturalists focused on making a geological field site and "philosophical landscape" out of northern Ireland's Giant's Causeway. He notes that "[i]t is the very particularity of the site that gives it value as an object of study" (2008:22). Himself critical of work that takes field sites as "self-contained units" from which scientific knowledge derives, he examines "the site" as only one component in a complex network of "intersecting locales within which scientists and science circulate" (Kennedy 2008:19).

In the case of speleological practice, caves too become "speleological sites" by

²⁶ I take up the contrast between adventure and exploration in Chapter 8.

virtue not just of individual caves' particular qualities, but by their entry into a system of others of their kind. This "entry" consist first of explorers finding, exploring, and surveying each cavern. As I will describe in Chapter 4, the process of surveying and mapping a cavern translates the characteristics of each site into a representation that simplifies and homogenizes dissimilar places through a process of inscription made possible by the invention of perspective. This representation then becomes what Bruno Latour calls an "immutable mobile" (Latour 1990:26-29;37; Rudwick 1989). Like others that have borrowed Latour's ideas, I am interested in following the trace of this representation, from the field, to notebooks, to archives, and beyond. Yet, I am also interested in understanding how this process of translation reflects back on the practice of exploration, the motivations of explorers themselves to do what they do *in the field*. In the case of the cadastre, much of the effect of these inscriptions derives from being part of a system. It is not just one cave inscribed, but one cave among many across a national territory that has been exhaustively and systematically explored, probed, and from a unique vantage point, represented. As I first argued in Chapter 2 and again here, this process echoes the collaborative mantra of *la Sociedad*, which rejects both geological and personal monumentality.

In many ways, naturalists' and popular focus on the Giant's Causeway resembles the natural and cultural history of Guácharo Cave. Both were sites with a rich history of mythical significance even prior to the attention of naturalists and scientists focused on producing accurate, "scientific" descriptions of the place. In the case of Guácharo Cave, this challenge was even more tantalizing, given the seemingly endless darkness that beckoned explorers. As individual sites, both the Giant's Causeway and Guácharo Cave

gained value as monuments, their particular geological, historical, cultural, and – particularly in the case of Guácharo Cave – ecological attributes weaving together to produce powerful icons of national significance. I contend, however, that there was an important shift in both the conception and practice of Venezuelan speleology that produced an alternative approach to Guácharo Cave as object and place of science. Once the SVE published its map of Guácharo Cave, the cavern became integrated into a national cadastral system.

Following toponymic standards that respect local names, the cave was in no way renamed. It was, however, assigned an index—Mo.1—that marked it as part of the Society’s national cave registry (“Mo” is short for Monagas, the state where the cavern is located, and the “1” refers to the fact that this was the first cavern that the group surveyed in the state).²⁷

SVE member Carlos Bosque emphasized that this impetus

presented an opportunity [to focus on science]... which gave exploration a more complete character. A consequence of this is that it gives caves more value. This is actually a very beautiful thing. A cave might be small but if it has petroglyphs, then it prompts more motivation for its exploration. [Bosque, Personal Communication, June 30, 2010]

²⁷ Following the Venezuelan Speleological Society’s own emphasis on the national cave registry prompted a shift in my own research, which originally focused on Guácharo Cave. During my fieldwork I learned that to narrow in on one cave missed the ways in which the value of each cave explored and surveyed depended on its being part of a broader national system, as system that translated geological features into a common, internationally recognized visual language. Moreover, such "one-cave" emphasis fetishizes caverns as bounded and cut-off spaces, instead of grasping them as part of a broader geological, hydrological, and ecological landscape. Exploration of this landscape, in fact, explains much of the appeal of Society outings for its members (see Chapter 6).

To Bosque, as well as other SVE members, to explore caverns systematically throughout the national territory, and to catalogue them using a common visual language, transformed their practice from exploration with colonial or eco-tourism overtones into a meaningful pursuit. This pursuit was a collective endeavor that rejected both geological and personal monumentality. Thus, there is more to this transformation of caves from field sites into maps, more than the mere technicalities of naming and cataloguing. It points to an ideological shift in the approach to speleological knowledge and practice, one that was deeply rooted in individual cavers' understanding of their own efforts, of their own place within the nation's natural and cultural landscape. At a more fundamental level, this view of caves corresponded to a particular epistemological stance on the need and method of producing and ordering knowledge of the world. This is a stance with roots in western imperial projects and ideologies, those very projects and ideologies that some SVE members hope to distinguish themselves from (Foucault 1973; Mignolo 2005; Pratt 1992).

Conclusion

In this chapter I present yet another perspective on the dialectic between sociality, scientific practice, and landscape. In particular, I analyze the production of speleological knowledge and of *la Sociedad* in relation to each other. As the group forged ahead with its national speleological cadastre, it helped define its internal unity among its diverse members. This was possible, I argue, because of the cave cadastre's quality as a boundary object. Not only did its members "come together at the map," in the words of SVE member Pedro Aso, they came together at the cadastre as this project promoted both the

exploration of more caves and their study and translation into objects of science. In the process, caves themselves were redefined as spaces of experience *and* part of a system from which they derived their value (at least to those that promoted speleological science).

With more speleological actors coming to the scene, efforts to coordinate the production speleological knowledge struggled to overcome personal rivalries. In this case, I suggest that “methods control” failed to bring *all* diverse actors together (although it did work for some) since these tactics did not separate the how from the why. Repeatedly SVE members involved in these debates stressed the moral and ethical dimensions of why certain rules ought to be adopted. This resulted in further galvanizing potential collaborators who had their own ideas about the kinds of speleology they would like to practice.

Finally, the national cave registry redefined caves from iconic sites that were important for what they contained or who had visited them to regular geological phenomena added to an archive, a network of many others of their kind. Here the language of science helped redefine caves. As one SVE member emphasized, this system made all caves valuable, regardless of their size or their geological and cultural histories. To grasp the relevance that this group puts on exploring and surveying any *one* cave requires understanding how and why it becomes part of a broader national system, a system that translates geological features into a common, internationally recognized visual language. Understanding how and why Guácharo Cave becomes Mo.1, I suggest, involves an anti-monumental gesture that also is mirrored in the group's collective and anti-personalistic rhetoric. As some Society members have told me, individuals such as

Brewer or de Bellard who were eager to promote their personal achievements as cave discoverers and explorers either are not interested in becoming part of the Society or do not last long after joining.

There is an important element to this story that I have hinted at throughout but have not addressed head-on, and that is the territorial politics of speleological practice. Although technically all caves are part national patrimony and speleologists do not physically appropriate the caverns they (sometimes) discover, (always) explore and survey, there is nonetheless a kind of territorial attitude present in the claim of one actor or another in authoritatively *representing* these spaces. Moreover, part of the moral and ethical attitudes linked to rules and standards of speleological practice contain in them elements of a national and even international imaginary that are worth exploring. I do this in Chapter 7. For now, let us turn to cave maps: How are they produced? This is the focus of the next Chapter.

Chapter 4

Exploring and Mapping Caves

With the end of the survey tape in my right hand, I crawled down a wide and low passage somewhere below the surface of Venezuela's Roraima plateau. The floor below me was covered in damp sand, smooth and regular, sloping slightly upward. As I forged ahead, ceiling and floor drew closer and closer together, obliging me to drop from knees and hands to my stomach. I pushed onward with increasing effort, propelling the weight of my body forward by pushing off with the tips of my boots and my hands and elbows. Like a gecko, I thought. My father once told me that geckos are enchanted creatures, embodiments of past cavers lost in the woods. Could they also be the reincarnation of the souls of cavers crushed by stone? Moving ahead became more and more laborious. I had to turn my head sideways to keep my helmet from getting stuck. It was at that point when it happened. Claustrophobia gripped my throat. It was not just the falling ceiling. It was the wet sand and the sudden fear of drowning. But I could see, as far as my light could shine, the passage continuing. To back off would mean not just abandoning what could be a promising passage, a key connection to more cave, but an incomplete map, a map with an open passage marked with a question mark.

To map this cave, indeed, to map any cave, requires this kind of bodily engagement with the underground. It involves an intimate experience with the world that is at once physical and affective, with emotions ranging from exhilaration to the kind of

fear that gripped me while I lay sandwiched between two slabs of stone. Yet, this bodily engagement also occurs in coordination with a disciplined social and material pulse of cartographic practice. Here, mapping is at once embodied, emplaced, *and* coordinated to an intensity rarely experienced elsewhere. Indeed, the body, or more specifically, bodies in synchrony with each other, *probe* the earth, their tools going in only so far as their owners push in and onward. This is because there is no technology that can accurately map a cave from the surface. Even locating caves poses dire challenges to existing technologies. Some geophysical methods such as negative density contrast, ground-penetrating radar, electrical resistivity, and 3-D seismic imaging afford some information on the possible existence and volume of "missing mass" underground, but applying these methods remains a challenge (Stierman 2004). The equipment involved can also be cumbersome and too expensive for most caving clubs around the world, so their use is typically limited to state or privately-funded engineering projects. Moreover, most of these tools are not accurate enough to determine the actual size of these voids, or whether or not there are several levels of passages. Gaps in the bedrock can be filled with air, water, or sediments, characteristics that are difficult to determine from the surface, not to mention the possibility that these spaces may house important mineral or archaeological artifacts, or even unique organisms that have adapted to these "extreme" environments. A 2004 *New York Times* article reporting the exploration of one of the deepest underground caves in the world echoes these technological limitations of cave exploration and surveying:

Sophisticated mapping has left very little room for dumb luck in surface exploration. But maps do not chart what lies beneath the land or ocean floor. "I'm not at all surprised that we're still making these sorts of discoveries [a vertical cave in Croatia 1,693 feet in depth]," said Lisa R.

Gaddis, the program chief of the United States Geological Survey's astrogeology team, "I think we have perhaps a better global picture of some other terrestrial planets, like Mars, than we have of some of the more remote areas on Earth." When it comes to caves, noted David E. Smith, chief of NASA's Laboratory for Terrestrial Physics, "we can't see anything from space." He added, "You can't really say very much, if anything at all, about below the surface." [Glassman 2004]

One must enter a cave to explore it, map it, and thus construct a representation of the enclosed space. This representation, in turn, enables the explorer to situate himself within what is often a maze of winding and overlapping passages. These practices grant an anachronistic second life to exploration that scholars often dismiss as a thing of the past. A recent volume on the anthropology of adventure begins stating that "[w]e live in a post-explorer era in which it is widely considered that the feats of the great adventurers are remnants of history and that the Earth's mysterious places and peoples have long 'been discovered'" (Gordon 2006:1).¹ In fact, cave explorers routinely make discoveries of so-called "virgin" caves and passages, underground spaces where humans have never been in before. Their expectation is that countless more such discoveries remain to be made. In his welcome message to the 15th International Congress of Speleology, held in August 2009 in Texas, International Union of Speleology president Andy Eavis remarked that "[p]robably no more than ten percent of the caves in the world have been explored and only a fraction of the potential cave science accomplished" (Eavis 2009). That much of this potential is accessible to individuals without major investments in sophisticated technologies makes this fact even more remarkable.²

¹ I owe Matthew Hull for the characterization of cave exploration as a case of anachronistic second life of exploration. I examine the notion of caving exploration as adventure in Chapter 8.

² There are other "frontiers" with "discovery" potential such as the deep ocean floor and space, but their technological barriers to entry hardly make them accessible to the

In this chapter I examine practices of cave exploration and mapping as examples that broaden investigations into the relations between scientific practice, sociality, and landscape. I already have remarked on the relatively low technological barriers to entry into these caving activities. The investment necessary to acquire relevant skills to engage in these practices is also relatively low. These two facts amount to an extraordinary ethnographic opportunity to study these activities, along with the potentials of “discovery,” in practice, in the field (see Lynch and Law 1999). I focus on cave mapping and the attempts to establish ethics, rules, and standards in the process of defining the priorities and boundaries of a community of practice, a topic addressed elsewhere in this dissertation (Chapters 2, 3, and 6). Key to these investigations are caves themselves as spaces where these issues play out in the field. How does a cave map come into being? What do these maps represent? Answering these questions reveals a distinct way of relating—physically, conceptually, and affectively—to the environment, its representations, and to others with whom we explore and survey this environment. Understanding these points again requires keeping the peculiarities of caves in the foreground. Indeed, the very definition of caves as objects of scientific inquiry and exploratory achievements depends on grasping the specificities of their exploration and mapping.

amateur scientist or explorer. There is one important exception in the caving world, and that is cave diving. While not necessarily expensive (certainly not within the magnitude of deep ocean or space exploration), this extremely risky activity does involve sophisticated scuba gear technologies, much of it developed by cave divers themselves (see Stone, am Ende, and Paulsen 2002). In this chapter, as well as in the rest of the dissertation, I focus primarily on “dry” caving, underground cave exploration that can and often does involve swimming or diving pools or subterranean sumps to make connections and advance discovery, but remains primarily a “dry” affair.

As I will show, cave mapping is an intensely social process requiring people to move not just in relation to the cave but also to each other. This process involves particular tools—for measuring, writing on, writing with, and lighting—that are specifically selected, designed, and/or altered to withstand the demands of the underground environment. It also involves an ethical commitment to the kinds of knowledge to be produced from this engagement. However, these commitments are in no way homogeneous, particularly within this diverse community of practice. Nor are they the dominant ideological forces that solely determine the form or meaning of engagements in/of place. While the goal of the cave map has been fundamental to the Society's identity as a scientific organization, it in no way represents the main motivation of most members of the group. To be more precise, it is the process of *mapping caves* that has energized the Society's membership and has made possible the conditions of the organization's continuity. This is because cave mapping requires a collaborative effort to *explore* them fully. This effort, in turn, depends on the map to determine the scope and potential of exploration. In the case of caves, cartographic and exploratory practices are in a dialectical relation that pivots around the scale and lived experience of the human body in contact with stone. Cave mapping challenges the depiction of cartographic practices as devoid of sensorial and poetic engagement with/in the world.

Mapping Caves

I experienced that memorable pang of claustrophobia in 2004 when I joined the Venezuelan Speleological Society on an expedition to map a cave perched within Roraima Plateau, located in southeastern Venezuela. Almost three thousand meters high,

this plateau's surface evokes a sense of other-worldliness, with balancing rocks and shapes carved by erosion during 70 million years, longer than most places on earth (Wray 2010:85). Near the southern edge are a series of entrances to an even more peculiar world, unlike anything above ground. It is amorphous, alternatively dry and wet from the rain that trickles through cracks, with unusual formations composed both of mineral and organic matter, and most of all, a space filled with absolute darkness, except for twilight zones near shafts and entrances that let sunlight in.

Since 2003, the Society, at times collaborating with international caving groups, had been exploring and mapping what they have called Sistema Roraima Sur, or Southern Roraima System (SRS). To date, the Society claims it is the longest quartzite cave in the world, with 10.8 kilometers of surveyed length (SVE 2004).³ This 2004 expedition brought together both more veteran and younger members of the Society, along with cavers from Spain. The trip was also a family event, with my father, a life-long SVE member, deciding to travel to Venezuela to join the expedition with my mother, two brothers, future husband, and myself in tow.

The basic principle of cave mapping involves creating a scaled two-dimensional line plot that represents the length, horizontal orientation, and vertical displacement of cave passages (refer to Fig.3.2). The basic tools are measuring tape, compass, and clinometer. As early as the 13th century, Tuscan miners used floating magnetic needles to determine the direction of underground passages. By the late 15th century, Italians and

³ There is an ongoing dispute over this cave, which members of the Slovak Speleological Society and the Czech Speleological Society also have explored and surveyed and call Crystal Eyes Cave (Smida, Audy, and Vlcek 2003). The SVE filed a formal complaint to the International Union of Speleology claiming that these cavers breached international caving ethical standards (SVE 2005). I examine this case more carefully, in the context of international caving politics, in Chapter 7.

Germans had embraced the compass as the standard mining way-finding equipment. Until recently, Agricola was considered the author of the first known printed plan of a human-made cave, published in 1546 (Shaw 1979:20). The first printed map of a *natural* cavern, however, appeared in 1638, in a publication titled “A description and draught of Pen Park Hole in Gloucestershire” by Robert Southwell (Wookey 2004:714). That distinction now lies with Belgian artist Odon Van Maelcote who engraved two maps of Sicilian caves of religious significance (Mancini and Forti 2009).

Interestingly, the basic principle of cave mapping has changed surprisingly little. I first learned and practiced this principle in a course on cave mapping and cartography at Western Kentucky University in 2003. But it was in Roraima that I tested my skills in so-called “virgin” passage, cave that no one had ever entered before or had any idea of where it might lead. During the morning of the first day of work, we broke up into three survey teams. There were three of us in my group, with my father as the most experienced (or at least, the most senior) taking on the role of sketcher. As sketcher, he was responsible for taking notes of the cave’s shape and measurements in his water resistant survey notebook. He did this in pencil since ink might smudge and run if wet. A compass to measure horizontal displacement and a clinometer to measure vertical displacement hung from his neck, both instruments connected by a string. I was assigned the role of tape leader. Paco, one of the Spanish cavers, accompanied me when he was not exploring ahead or in some side passage “scouting” out the cave.

As tape leader, I was always ahead of my father, unrolling the survey tape that physically connected us and measured the distance between us. My job was to move ahead in straight-line segments, as much as the cave allowed, and to establish survey

stations, points at which measurements would be taken.⁴ To determine the segment's azimuth (bearing), my father peeked through the viewer of the hand-held compass, and read the value that coincided with my headlight in the distance. Similarly with the clinometer, which provided the inclination (vertical displacement) between the point I was standing at and his previous "station." I had to stand still to provide a steady light in the dark distance. As the sketcher of the team, my father entered the following values in the left-hand page of his survey book, already prepared with columns to enter survey data: the name of the passage segment between two points (for example, "1-2"), the compass bearing, the vertical displacement, and the distance between these two points. He also marked the distances to the ceiling, to the floor, right, and left on the facing page in his notebook, where he swiftly sketched in freehand the plan view, or view from the top, of the passages we traversed. A number value next to the passage sketch corresponded to its estimated width, while a value in a circle corresponded to its height, also estimated.⁵

⁴ There are many ways of marking survey stations, which vary widely in their impact to the cavern, while others opt for leaving no trace or mark at all. In caves with no flooding risk, some cavers opt to leave a small piece of mylar tape with the station name written with permanent marker. Others resort to more permanent options, particularly in caves that are muddier and wetter: a poker chip with a small perforation through which runs a small piece of wire that can then be attached to a protruding rock formation is an option for some. In Venezuela, I witnessed some stations marked with the soot of the carbide flame of the cavers' headlamp. In the 1960s, prior to a more ecological sensibility to the cave environment, some cavers actually painted the names onto rock formations and walls within the cave.

⁵ Sketchers – indeed, cavers – with more experience are better able to estimate sizes and draw details with greater accuracy without compromising swiftness. In some areas of the world, caving groups have access to laser pointers that accurately measure such distances, but they remain relatively costly and delicate technologies that are not accessible to many, and some would argue, not really necessary to produce an accurate cave map. Learning proper skills, especially those that result in better communication and teamwork among the members of the surveying team, is crucial for achieving more reliable results

Once the three different teams agreed upon which passages to start their work, my father took out his survey notebook from his waterproof backpack, ready to begin sketching. He stood in what we determined as point 1. He drew a dot in the graphing paper corresponding to this spot. I then moved along the cave passage ahead of me, unrolling the survey tape as I went, looking around me, and ahead of me, the beam of my headlight in a constant swirl, searching for any salient features (such as side openings to other passages or a sudden change in elevation or the presence of formations) that might warrant I stop and establish the second survey station. I stopped next to what appeared to be the opening to a side passage. “On station!” I called back and read out loud the distance off the survey tape: 12 meters. I stood still, facing my father, as he focused on my light as a point in the distance to measure the horizontal orientation of the passage between survey station 1, where he stood, and survey station 2, where I stopped. Ten degrees. This segment of the passage, then, veered slightly northeast. There was no vertical displacement—I had neither gone down nor gone up along these 12 meters of passage (Fig. 4.1). My father estimated to 5 meters the height of the passage at his point, and to 10 meters its width. He also quickly looked around him, sketching any salient features, including the contours of the walls that contained us, as one would represent the lines of the embankment of a river. A curvy arrow signified a water stream running along the passage’s floor. A square represented large stone boulders in the passage. When he was ready and had caught up with me (winding up the survey tape along the way), I

in the cave mapping process. But most fundamental of all, a cave that is to be mapped is a cave that must be explored and traversed. Shying away from an ongoing passage increases the likelihood of producing an “incomplete” map, of reducing its accuracy, of casting doubt on the entire cartographic project. Finally, shying away from an ongoing passage raises questions about one’s reliability as a survey team member.

turned again to face the dark passage ahead of us, again unraveling the tape measure as I carefully moved along. "On station!" again I called out. Distance: 7.5 meters. Compass reading: 10 degrees (no change in orientation). I stopped at a point where there appeared to be another passage to my right and a small pool of water to my left. This was survey station number 3. The process repeated itself for several hours, as we moved along what appeared to us to be the main cave passage. Exploring and surveying those tantalizing side openings that we passed along the way would remain pending for us later or for another team to take on.

Several times in Sistema Roraima Sur, while our survey team took a break or gathered with members of other teams in those exciting moments when we realized we were connecting different cave sectors, I glanced at my father's field notes. As the plan view of the cavern began to take shape, we were able to use it as a representational tool that helped us determine where we were and where we had been. His sketch worked as a "computational device" that affords a more reliable and graphic sense of creating and maintaining "positional consciousness" in much the same way that navigational charts help seafarers locate themselves within a vast sea (Burnett 2000:100-101; Hutchins 1995).

Cave mapping is a team effort. Moreover, team members must be aware of each other's position and movements as they negotiate the cave environment that encloses them. For one, the tape leader has to select points that balance survey accuracy and the team's resources: time, food, lighting fuel, and stamina. Establishing too many stations might produce a more accurate map, but when considering the scale at which the cave will eventually be represented, the difference between twice as many or half as many

stations might be negligible. In Sistema Roraima Sur, for example, what we thought was a five-day work session was cut down to three due to problems with our permit, which we thought had been cleared in Caracas, prior to our trip down to Canaima National Park.⁶ Thus, we knew we had to work swiftly, aware that trips to this region of the country represented a more serious investment of time and resources, relative to other cave areas of the country. Moreover, the selection of stations requires the consideration of the physical conditions of fellow group members, who will proceed to stand—or sit, stretch out, crouch, or hang—at the selected station, where they require time to produce a sketch of the passage just traversed (for example, stopping at a point under a gushing waterfall makes no practical sense). Also, each leg must be a straight shot connecting the two points. Otherwise, the survey tape will bend and thus the distance reading between the two points will not be accurate. Also, the tape leader must stand at a point where he (his helmet light) is visible to his partner behind him since that light serves as a reference point in the otherwise pitch black horizon. Two important consequences result from this process: The first is that every member of the survey group is acutely aware of all other members' physical condition in relation to the cave environment and to each other (or at least they should be, if the surveying is to be done successfully). The second is that the sequential construction of the cave map, as determined by the progressive addition of stations, is a function of the interplay of spatial and material qualities of the environment, the physical and social qualities of the group, and their tools.

These qualities make cave surveying a distinctly *disciplined* process that requires

⁶ I describe this incident in more detail in Chapter 7.

particular ways of moving and perceiving.⁷ Once enveloped in the complete darkness of a cave, pierced only by the limited scope of our headlights, I realized not just the importance of working in teams, but of communicating in the process. Indeed, to speak of the “physicality” of caves is incomplete without considering the dynamic light and soundscapes that fill the underground space (Bille and Sørensen 2007; Helmreich 2007). They are dynamic because human bodies are in constant movement (Ingold 2000, 2007; Macpherson 2010; Massey 2005; Rose 2006; Thrift 1996). If I did not speak clearly, my father might not write down the correct distance measurement. I also had to remember to tell him whether I was no longer standing. Not knowing could introduce an error of +/- 1.5 meters at every survey point.

Although I did not take on the role of sketcher while in Roraima, having done so during my cave and cartography course in Kentucky back in 2003 taught me the importance of selecting survey stations strategically. I needed to balance swift and efficient work with accuracy as I made choices about where to establish the next measuring station. My observations and explorations of the cave passages informed this decision. Are there sudden changes in the inclination or surface features in the passage? How far can I extend a survey leg prior to hitting a bend that will not allow for a straight

⁷ To some in the caving community in the United States, in fact, cave surveying muddies an unencumbered and somehow truer and more intimate experience with/in a cave. These same individuals, in fact, reject the very ideology of cave mapping that is central to caving as a "scientific" pursuit (Chabert and Watson 1981:7). I will return to this topic further on. I did not encounter this sentiment among any of the members of the Venezuelan Speleological Society that I interviewed. However, this is most likely because their condition as members of this group already aligned them with the view of cave maps and mapping as a fundamental part of speleological practice. It also is possible that many reject this view as a false dichotomy between exploration and mapping. In fact, I argue a position similar to this. In the cave environment, exploration and mapping are interdependent in the cave environment.

shot of the measuring tape? Moreover, how far can I go before my teammate ceases to be able to see my headlight? Are there dripping water or pools, or even delicate cave formations ahead, which constrain determination of a station? As I learned in Kentucky, I roughly attempted to place myself along the middle of the cave passage, although sometimes, because of the irregularity of the cave floor, this was not possible. In Roraima, Paco suggested I do my best to establish segments with distances measured in whole numbers, or at least, half numbers. Why stop at 12.8 meters if you can stop at 13? These decisions, he explained, help diminish error in data entry, not just in the surveyor's journal, but also eventually in the transformation of these data into a properly scaled and oriented line plot of the cave.

These concerns not only required constant awareness of and engagement with other team members and with the distinct affordances of the cave environment (Ingold 2000:166-168; Gibson 1979). They also reflect an awareness of the purpose of the activity enfolding: to thoroughly explore and survey underground passages *in order to* produce a two-dimensional representation of the space, along with a detailed description that would eventually lead some to propose hypotheses of how it might have formed. As I describe in Chapter 3, embracing this purpose was and remains fundamental to the Venezuelan Speleological Society.

Before turning over to a detailed analysis of the “views” that cave maps confer, I want to stress the fact that the principle of cave mapping holds regardless of the specificities of the cave environment. These environments are extremely diverse in terms of size, shape, temperature, presence/absence of water, and ecologies contained therein. In navigating this landscape, whose characteristics become evident only as they unfold to

the moving/sensing body, survey teams are exploration teams in the full sense of the term. Together, members overcome physical challenges (their own and the cave's) and sometimes expose themselves to great risks. Viewed from this perspective, cave exploration is in the same category as other adventure pursuits such as mountaineering and rock climbing (Cosgrove and della Dora 2009; Ortner 1999; Ness 2010). My ethnographic accounts of cave mapping do not emphasize its sporting qualities because they took place in less challenging caves (relatively horizontal, not requiring technical climbing skills nor endless tight passages).⁸ My limited experience precluded me from participating in more challenging engagements. During an 2008 SVE expedition to northern Monagas, I waited along the edge of a deep pit as the three more experienced members of the group selected a sturdy tree to secure their rope, and one by one, rappelled down into the underground to explore and survey the cavern. That brief moment during which these three men negotiated the sturdiness of their anchor and then followed each other into the unknown illustrated the importance of collective trust as they faced the risky prospects of exploring the deep pit. No one knew how far and where it went, but together, they would find out.

@@Cave mapping is filled with instances such as these when team members must work together towards a collective goal, all the while facing both the risk and thrill inherent in cave exploration. To my cave surveying instructor, Pat Kambesis, cave exploration has the potential of producing special bonds among its actors since they are constantly putting their lives at in the hands of others (Kambesis, Personal Communication, August 5, 2011). That 2008 event also illustrated their commitment to

⁸ But see Chapter 6.

the speleological enterprise as a collective pursuit. Neither of them would be crowned as the “discoverer.” The map would be a product of *la Sociedad* (including all of us onlookers who together carried equipment out to this point deep in the forest).

Vision and Perspective in/of the Cave Landscape and Its Representation

Chapter 2 provides a preview of the elements of the cave map, in that case of Guácharo Cave. Here I want to consider the cave map in more detail. The final map of Sistema Roraima Sur, published in the 38th volume of the *Boletín de la Sociedad Venezolana de Espeleología*, represents three perspectives of the cavern (SVE 2004). The first is a plan view, or view from the top (Fig. 4.2). This requires an imaginative leap: the fantasy of observing the cave from above. But “above” where or what? Certainly not “above” the cave, since this (in theory) would amount to “seeing” the outer shell of the cavern, as if we were standing on the top of a water pipe looking down. Another imaginative leap is required: “slicing” the pipe horizontally along the plane determined by the position of the sketcher and “opening it up.” What the cave cartographer represents with the plan view then, is the inner contour of the sliced pipe. Two measurements (or estimates) aid this process. At each survey point, the sketcher notes the distances, from this point, to the left and to the right walls of the cavern. This is anything but straightforward (Chabert and Watson 1981). What if to the right of the sketcher there is a wide limestone column? Is this the wall or should the column be considered an element contained within the passage? Moreover, the sketching team usually does not physically traverse along all inner contours of the cavern, but roughly along the middle of the passage. This means that the sketcher often relies on vision (which is only as good as his lightsource) to

ascertain the shape of these contours. There are exceptions to this. In tight passages barely big enough for one's body to pass through, the landscape is not so much seen as experienced.

The intimacy with the landscape that cave mapping affords (indeed, *demand*s, given the technological limits described above) is categorically different from any other kind of cartographic and exploratory endeavor. Surface surveying has been and remains a practice of defining and delimiting the landscape at a distance. In the cartographic toolkit of empires focused on defining their territories, options included determining the location of "control points" by astronomical readings and the distance between them (Edney 1997:19). Yet, as Matthew Edney notes in the case of imperial Britain's mapping of India (1997), these astronomical readings were plagued with uncertainties, putting into doubt all other measurements that depended on them (1997:18). The introduction of trigonometric survey techniques appeared to solve these problems since they offered a mathematically rigorous way of linking the location and relative distance and angles among these points that did not depend (or depended much less) on astronomical readings (1997:21). As Edney argues, techniques such as these helped fuel the faith in a cartographic ideal: that more sophisticated technologies could deliver complete and accurate knowledge of the real world as is, and that, moreover, this knowledge could be effectively archived and utilized to further the imperial, scientific, and capitalists interests of its architects and producers (1997:24). Yet, when viewed in practice, these technologies reveal serious shortcomings that explode the myth of empires as monolithic and all encompassing (Edney 1997:25). Even while "following" surveyors along roads, in entangled relations with inhabitants, struggling to make technologies work properly in the

field, these survey efforts and the engagements with the land they afford remain limited along paths that either circumvent, connect, or delimit “control points” used to anchor and connect two-dimensional views of the landscape.

Exploring the intimacies and entanglements produced along these paths is a task that some scholars have taken up. Their efforts do not just question the view of the monolithic and all-encompassing empire. In a recent example of such efforts, Mueggler follows the trail of British imperial geographers and botanists in early twentieth century China (2005). In these accounts, the theodolite as a powerful technology of perception plays a key role in surveyors’ capacity to construct these views and enact (or think they can enact) this cartographic and epistemological ideal that Edney describes. Critically, theodolites are delicate and cumbersome tools to carry across the landscape, which remains, even in efforts to get away from proscribed paths, a visual object (Mueggler 2005:451-452). Even in the case of the traverse survey, which Graham Burnett examines in the case of the mapping of British Guiana, cartographic practice remains bound to a series of paths that connect “nodal points” that fix surveys in the landscape (Burnett 2000:129). As the traverse surveyor moves along paths that eventually will represent boundaries in maps, the bodily engagement with the landscape remains limited to a minuscule portion of the area these maps aim to represent. Indeed, these maps and the practices involved in their production remain wedded to an epistemological project whereby vision, aided by increasingly sophisticated technologies, defines the object.

Traversing the landscape, surveyors and explorers alike, rely on vision to anticipate the course of their journeys. This is true even in environments lacking landmarks that aid orientation. Whether guided by stars, a point in the horizon fixed by

the sextant, or a GPS reader, the traveler usually is able to see what comes ahead (or at least imagine with relative certainty what awaits). Mountaineers and rock climbers, who also produce route maps, are able to envision their next move, even prior to what undoubtedly is an intensely embodied engagement with the landscape (Abramson and Fletcher 2007; MacLaren, Higgs, and Zezulka-Mailloux 2005; Ness 2010; Ortner 1999).

In cave exploration and mapping, this reliability on vision (even when technologically aided) to inform anticipated moves through the landscape is very limited, if not impossible. Indeed, the reliability of vision is a function of the intensity and range of the team's lighting sources. Unlike landscapes that are awash in light, deep in a cave darkness is absolute.⁹ This changes as explorers penetrate passages with their lighting technologies, usually propped on their heads, leaving their hands free to climb, crawl, or slither along. The result is ever shifting lightscapes, "changing landscapes of light and darkness" that determine "the appearance of the world" as they cast "shadows in the relationship between things, persons, and light" (Bille and Sørensen 2007:267). These lightscapes are ever shifting, because light is on the move hinged to the explorers' bodies. To light one's way, to see where one is going, requires deliberate bodily motions to scan the surroundings. This is done piecemeal; only where the light shines does a portion of the cave become visible. As soon as the scanning proceeds, darkness quickly gobbles this portion up. As a survey trip lengthens and the demands the cave traverse makes on the physical capacities of its explorers increases, this seemingly simple task of "scanning"

⁹ More light does not always mean more capacity to visually perceive one's surroundings. An arctic explorer or mountaineer in a windy snowstorm, even if they happen in the middle of the day, can be completely paralyzed by their blindness. In these cases, one can appreciate the capacity to perceive *contrasts* in the landscape.

the surroundings with light contributes to overall exhaustion.¹⁰ During my first experiences as sketcher, I recall the frustration of trying and failing to “take in” a view of the cave that contained me. I cursed the low quality of my headlamp, swearing I’d buy the best headlamp in the market prior to my next cave experience. In effect, I imagined the beam of my light as a miner’s shovel attempting to dig through the thick darkness.

As it turns out, actually drawing the plan view amounts to sketching wiggly lines of variable accuracy, a practice that improves with experience. Paul Carter ponders on the meanings of the cartographers’ lines as his boat navigates the shoreline. This is no easy task: the boat never is still, never at a precise or constant distance from the shore. The gesture of tracing on paper that line with ink, is, at the end, part imaginative, part creative, with only limited relation to a “reality” that is difficult to define, to bound (where, after all, does a coast begin and where does it end?) (Carter 1999). The final result of sketching the cave’s plan view looks like two lines representing the shoreline, on each side, of a river, with its “central axis” corresponding to the straight lines connecting each survey station. These survey lines represent the *actual* physical traverse of the surveyors within the cavern.

Once this inner contour of the cave is drawn, the sketcher adds some detail of the elements contained within the passage. Using a series of established symbols, the sketcher marks ascending or descending slopes, streams or puddles, the presence of speleothemes (stalagtites, stalagmites, flowstone, etc.), whether the ground amounts to sand or large rocks or “breakdown,” etc.

The second perspective of the represented cavern is its “profile” (Fig. 4.3). This

¹⁰ This specially is true if the explorer’s main light source is an electric light connected by a wire to a large battery pack located on the back of the helmet.

view slices the cave lengthwise along a vertical axis. It requires projecting all of the segment lengths onto one same plane using simple trigonometric conversions. Thus, this side view does not represent actual distance traversed, what cavers refer to as continuous linear development (Chabert and Watson 1981:7). What it does do is give a visual representation of the verticality of the cavern, how high or low passages are, where they slope up or down, and also how several levels of passages relate to each other spatially.

A cavern's final map contains a third and final perspective, its cross-sections.¹¹

These cross-sections correspond to yet another vertical slice of the cavern, this time along a plane perpendicular to the explorers' traverse. The afforded view is the same that a doctor might show a patient to emphasize the amount of obstruction present in an artery. Thus, cross-sections give no sense of length of passage, but do give good detail of the shape of the passage at any one given point. These representations are drawn while in the cave, usually at a point corresponding to a survey station. They are challenging to sketch, especially for an inexperienced surveyor. Like the plan view drawn as one maps a cavern, these cross-sectional perspectives require an imaginative leap as we run our eyes along the contours of the passage. The tendency to draw depth perspective must be suppressed, emphasizing instead a flat two-dimensional vertical slice of the cavern along the plane perpendicular to one's traverse. These cross-sections are then featured in the final cave map composite, usually with a line graphically linking them to the point along the plan view that corresponds to where they were actually drawn.¹²

¹¹ The Sistema Roraima Sur final cave map has no cross-sections, but the Guácharo Cave map discussed in Chapter 2 does. See Fig. 2.6.

¹² As Shaw makes clear in his history of speleogenetic theories, accurate cross-sections provided naturalists valuable information that eventually led to how these passages may have been formed. But to produce these views first required that these naturalists head

The “Mapping What You Survey” Imperative

As I describe in Chapter 2, my father learned to survey caves with his friend Omar Linares. They applied in the field what they saw in published cave maps that they sought out in libraries in Caracas. I pressed Linares to tell me how they learned: “Nobody taught us! We taught ourselves,” he insisted (Linares, Personal Communication, September 19, 2011). His also was an affirmation of valued traits that I have heard other early members of the Society echo: the traits of independence, self-reliance, and initiative. The Society was and has never been a school, although as I describe in Chapter 3, efforts to formalize training have been made. Most veterans scoffed at this, or participated only half-heartedly. One learns by doing, the mantra seems to state. One learns by giving it one’s all (“echándole bolas!”).¹³ With enough members of the Society espousing this mantra, either implicitly or explicitly, Tronchoni’s vision of an open and welcoming group was challenged, or at least complicated. I will return to this theme further on. For now, I want to consider some of the differences between my father’s surveying style and my own, which I learned in the formal setting of a *class*.

For one, my father did not sketch to scale, nor did he plot the actual segment orientation values that he obtained with his compass. Thus, a cave passage that actually meanders for 11 meters in a 40-degree direction and then ten more meters at 38 degrees is sketched as an ongoing passage with no directional change or attention to the actual length of passage. When I explained to him and other Society members that in Kentucky, I had been taught to sketch to scale, using a small protractor to measure the actual angles

underground to observe the cavern, and from there determine two-dimensional perspectives that might best represent what were often complex and always three-dimensional geological phenomena (Shaw 2004).

¹³ See Chapter 6.

of the cave passages and a small ruler to connect my survey points on paper, they laughed (refer back to Fig. 3.2). Most poked fun at what they saw as typically fastidious and ultimately inefficient “gringo” ways of doing things. I begged to differ, defending my instructor’s argument that by learning to use these tools well and by producing the most accurate map while *in the cave*, errors could be avoided, or at least corrected before an expedition was over. My defense, some further joked, only proved how thorough and socialized I had become in this country I now called home.

Seven years later, when I returned to my father’s field notebook in an attempt to *see* exactly what portion of the cave we had surveyed, he conceded that had his sketch been done to scale, incorporating actual passage orientation, that would have been an easier task. I felt vindicated. I could have, of course, plotted the values of each line segment in survey paper. But that was exactly what he had already done shortly after our return to Caracas after the Roraima expedition. He handed these notes over to his friend and fellow SVE member Carlos Galán, who collected all survey teams’ notes and produced the final cartographic representation of Sistema Roraima Sur. Galán, having in his possession my father’s scaled and properly oriented survey notes, was able to spare me the effort of using ruler and protractor. He sent me an image of the cave map highlighting the passages my team had surveyed (Fig. 4.4). Even then, it was difficult for me to *read* my father’s field notes and establish a correspondence between them and the final map.

Most cave explorers understand that a cave explored ought to be mapped. This imperative, which was part of Martel’s vision of speleology, has become virtually ubiquitous among cavers all over the world, whether their inclination is towards the

sporting or scientific aspects of cave exploration (Watson and Chabert 1981). For the Venezuelan Speleological Society, a key part of its identity as a scientific organization rested on the acceptance and execution of this imperative.

My Kentucky instructor's insistence that we map the cave as we surveyed responds to a key concern: that greater survey accuracy be achieved *while* in the field. Mapping as one surveys requires a commitment to be more vigilant of one's surroundings, something that translates to more data in the field book that will then be used—elsewhere in the (hopefully near) future—to draft the final map and report. More complete survey notes reduce the interpretative guessing game sometimes involved in drafting the final map from notes poor in detail. Moreover, detailed survey notes make them more legible to others who eventually might be involved in the final drafting of the map, as was Galán's case for Sistema Roraima Sur. A particular ethical stance informs my instructor's cave surveying approach: that caving is a collaborative process with effective communication as its primary goal. Who could disagree? Despite different approaches in the field, certainly not my father or any members of the Venezuelan Speleological Society who have embraced mapping as a fundamental quality of their activity, precisely what distinguishes them from leisure cavers or eco-tourists.

In a 1988 editorial in the U.S. caver periodical *Compass and Tape*, John Ganter extols the importance of transforming survey notes into maps. Survey notes, which, at their minimum, amount to line plots (those segments connecting points representing survey stations), are not enough:

The survey traverse is a metric artifact of the way we orient ourselves underground. . . . [I]t is just a data display. A data display becomes a map when a human gets involved and performs a *subjective* interpretation of the data. The human thinks, and the thought goes on the map. There is

something here; it is represented by this symbol. A drop is here; they will need this amount of rope. This is a good lead; they will need to dig. As the Mapper interprets the cave, using notes, the traverse plot and memory, he or she creates through words and graphics an explicit document telling about the cave. The process is laborious, but the product communicates and explains, laying the foundation for future efforts. [Ganter 1988:2]

Citing Michael Polanyi, Ganter argues for the need to convert survey notes (tacit knowledge) into maps (explicit knowledge): “So how are we to learn about caves, to ‘see’ them, unless tacit knowledge is promptly refined into maps and descriptions?” (Ganter 1988:1). A commitment to this transformation espouses the idea that caves are to be explored *and* made visible, made legible, to a wider audience, whether current or future cavers within one’s own club or society, and beyond. In practice this dictum is fraught with tensions. Some cite the concern that the best-conserved caves are those not made visible at all. Their locations are kept secret. Maps, if produced, are not circulated. Others jealously guard their exploratory efforts, particularly if they hold potential for significant discoveries. Information leaked of this potential could lead to “getting scooped” by a competing caving group. Central to the discussion here is that a more thorough appreciation of a politics of speleological knowledge production begins in the field, in that very space that is simultaneously a stage and object of inquiry.

Deeply committed to both the “map as you explore” and “map what you survey” dictums, the members of the Venezuelan Speleological Society 2004 Roraima expedition organized a dinner party once back in Caracas. In fact, the main purpose of this event was to make sure that all sketchers of the recent survey effort do precisely what Ganter describes: transform individual survey notes into explicit knowledge in the form of a map readable by others in the team. There was special interest that my father do his part, since he was about to return to the United States. I sat next to him as he plotted out to scale,

and with proper orientations, on graphing paper the data points we had gathered during our exploration of Sistema Roraima Sur. He used a ruler and a simple protractor, the same kind that high schoolers use in an introductory geometry class. Here on this dinner table in the apartment of an uncle, who agreed to host the party, overlooking a Caracas neighborhood lush with tropical vegetation, there was no concern about light. Nor was there any concern with dropping one's tools in water or mud, the dirt stains on his field notebook reminding us how conditions are otherwise back in the cave. Better yet—for me, at least!—there was no fear of claustrophobia, the very high and smooth ceilings a safe distance from one's head. As my father drew the plan view, the shape of galleries began to take two-dimensional shape. I strained to remember precisely where we had been, to find a one-to-one correspondence between what I saw represented on paper and the memory of traversing passages. “What about that point where I did not continue, where we had to turn back but the passage did not end?” I asked. “That point I mark here with a question mark (*una interrogante*),” my father replied. On a follow up expedition cavers would return to this point and explore further, if possible. If not, the question mark would remain, a symbolic reminder of the human limits of exploration, a reminder of cave's resistance at being completely bounded, totally knowable.¹⁴

Challenging Dichotomies of Ways of Experiencing/Representing the World

As my father sketched the innards of Sistema Roraima Sur, his drawings on his water-resistant field book of the cavern's plan view resulted, in part, from an imaginative

¹⁴ Juan Antonio Tronchoni, along with other SVE members who did not participate in the SRS expedition but were long-time friends of my father, attended this dinner party at my uncle's home.

perspective of the inner volume that contained us. This "imaginative perspective," however, might better be referred to as a shift in perspective, or a "projection" made possible by our cave traverse *and* our coordinated efforts as a team using particular tools. To refer to the plan, profile, or cross-sectional views as "imaginative" however, risks characterizing them as somehow fictitious, with no relation to reality. Furthermore, it risks relegating the resulting representation as the product of a disembodied mind. In fact, this cave surveying process is a powerful ethnographic example that supports various scholars' theorizations that emphasize the distributed, phenomenological, and ecological quality of human cognition (e.g., Bateson 1972[1955]; Gibson 1979; Hutchins 1995; Ingold 2000; Merleau-Ponty 2005[1945]).¹⁵ It also illustrates "the ways nature, place, and person become entangled in the practices of documentary production" and how these practices in turn can be understood as "technologies of perception with the power to shape many forms of relatedness," a point that I will return to repeatedly throughout (Mueggler 2005:722, 724).

Comparisons to other representations of the underground (and the conditions of their making) are in order. In a creative and thought-provoking attempt to lay out the foundations of a "comparative anthropology of the line," Timothy Ingold argues that many of the activities that both human and other beings engage in to make themselves home in the world involve the making of and movements along lines (2007:1). He suggests a general taxonomy of the line, which includes threads and traces. A thread is "a filament of some kind, which may be entangled with other threads or suspended between

¹⁵ This extension of cognition beyond the domain of the mind, what Hutchins's refers to "distributed cognition" (1995) is, in the opinion of some, precisely what anthropologists refer to as "culture" (see Ortner 2001).

points in three-dimensional space" (2007:41). A trace is "any enduring mark left in or on a solid surface by a continuous movement" (2007:43). Lines' potential as objects of ethnographic inquiry lies, in part, in their capacity to turn into one another. Particularly in the case of traces, their relationship to different kinds of surfaces intrigues Ingold. He explores this relationship in his discussion of mazes and labyrinths. It features productive comparisons to both the experience and representational products of cave exploration and surveying.

Ingold cites the story of Theseus, the Athenian hero who defeats the Minotaur of the Labyrinth of Knossos as one of the many cross-cultural examples of how mazes and labyrinths are considered powerful sites of "wayfaring in a world of the dead" (2007:53). In his *Mazes and Labyrinths: A General Account of their History and Developments*, Matthews features a sketch of the Caverns of Gortyna located in southern Crete, and which some had suggested was the actual Labyrinth of Knossos (Ingold 2007:54). The sketcher was traveler F.W. Sieber, who allegedly produced what is clearly a plan view of the cavern in 1817. Ingold, which reproduces the image, does not consider what Sieber's actual experience traversing and mapping this cavern might have been, and instead focuses on the mythical qualities of labyrinths as places where the disembodied souls of the dead roam endlessly. This emphasis leads to a gross misrepresentation of what characterizes human experience underground.

To Ingold, "whereas the living, in making their way in the world, follow the traces left by their predecessors *upon* the surface of the earth, the dead have to thread their way *through* its interstices" (2007:54). Within this stark dichotomy, the possibility of thinking about Sieber traversing the passages of Gortyna, or SVE teams exploring and surveying

the inner world of Sistema Roraima Sur, is shut out. Moreover, caverns themselves are denied their inner and variously decorated surfaces, their inner ecologies and hydrologies, and their porous connection and relation to the "outer world." To Ingold, the ghostly traveler, whom he equates to "potholers"—the British term for “caver,”

does not have the perception of walking upon solid ground, with the earth beneath his feet and the sky above, nor does he have the advantage of an all-round vision and hearing. He is not, as we would say, 'out in the open'. To the contrary, he is fully enclosed within the earth, shut up in a medium that affords movement only along its cracks and crevices, and that insulates him from sensory contact with his surroundings. Unable to see where he is going he can have no idea, when paths diverge, of which to take. [2007:54]

For those who venture underground to explore and survey, this characterization could not be farther from their experience.¹⁶ All Venezuelan speleologists I interviewed, regardless of age, education, and even, their commitment to the "scientific" enterprise of the Society, enjoyed the experience of cave exploration first and foremost, and repeatedly spoke of caves as if having personalities, as sensuous living beings. In their view, caves do not close in on them, but instead, "open up" (see also Brucker and Watson 1987).

Analyzing caver subjectivities, human geographer Sarah Cant suggests we think about caving as a form of poetics that “flux between human geographies of exploration and encounter, and physical geographies of space within rock: limestone, water and calcite” (Cant 2003:69). Further, she argues, caver accounts of their experiences, some of them expressed through poetry and sculpture, suggest “relational understandings of

¹⁶ For others, this characterization might in fact be exactly what comes to mind at the mention of a cave. That caverns can elicit such contrasting and equally powerful reactions speaks to their ambivalent and mysterious character, a topic I address more fully in Chapter 3. However, I argue that *despite* the possible reactions, an accurate description of a cave environment cannot deny its varied and often, organic, materiality.

bodies and environments that dwell on the human-ness of a subterranean physical geography” (Cant 2003:69).

In his book *The Absent Body* (1990), philosopher Drew Leder argues that “the disappearance of the body from our awareness” characterizes much of human modern experience (Cant 2003:74). Disease, however, can powerfully disrupt this condition of “unexperienceable depth” by bringing to the fore, in uncomfortable and unwanted ways, the physicality of our existence (Csordas 1994:8). There are other ways, however, that our steady state of bodily unawares can be disrupted. Building on Leder, Cant notes that the prevalence of this bodily condition (the condition of its disappearance from our awareness) is

partly because vision is often elevated above all other senses and because 'awareness' of the individual body often happens when a body 'touches' something else, but here it is not the 'whole' body that is 'aware', only the body part affected by impact. As an activity practiced (in most cases) 'away from everyday life', cave exploration is constructed as an experience which is characterized by a rediscovery of the body, a bringing of somatic awareness albeit in very specific circumstances. [2003:74]

But the world also “touches” back, and sometimes, in unpredictable ways (Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990). Caves’ sinuous volumes—filled, unexpectedly, intermittently, with sand, water, jagged or smooth rock, mud, cave organisms—surprise the human body on the move. Caves’ particular qualities, what Gibson calls “affordances,” engage all of the human senses, sometimes simultaneously (1979; Ingold 2000:166-168). And this occurs even as speleologists *map*.

That Cant’s essay on the poetics of caving focuses on caving as leisure pursuit, and makes no mention of cave surveying raises my suspicions of a tendency to deny any

activities that resemble cartographic practices their own sensuous potential.¹⁷ Cave exploration and surveying emphasizes not just an intimate engagement with place, but also among individuals and their tools as they move about and try to make sense of *where they are* and *where they have been* in the underground environment. While Ingold is correct that there is no perspective that reveals the layout of subterranean cave passages, this does not necessarily mean its visitor will get lost and die, his soul forever bound to wander in darkness (2007:56)! On the contrary, to those who willingly and even giddily venture underground, not having this previous knowledge is precisely what charges their curiosity to explore and map. To many, there is joy in this challenge. To some, even, it is the essence of life itself (Watson 1994). Thus, we must question Ingold's depiction of life as journey restricted to walking on surfaces out in the open, and even, the idea of this journey occurring along the paths of those who came before us. What about venturing off along some other route, a route that we make as we move along, not knowing, and also not really minding, where it might lead?¹⁸

¹⁷ I have already pointed to another article by Cant focusing on speleology among British caving groups (2006). While it addresses the many relevant topics relevant to the social, political, and historical dynamics of cave exploration and mapping as a field sports-science, and even, the role of place in the shaping of these "geographies," there is no consideration of the sensuous and poetic aspect of cave mapping as a central component of the experience of cave exploration and the production of speleological knowledge itself. My work, with its ethnographic emphasis on the exploration *and* mapping as integral components of the same activity, aims to bridge this gap.

¹⁸ What of the indefatigable curiosity of young children eager to climb and crawl wherever they see fit? What of their intense attraction to hidden places, those small nooks and crannies they might call their own (Bachelard 1994[1969]; Goodenough 2003)? In an effort to push an argument within his comparative anthropology of the line, these special places, these special relations to very particular kinds of places that incite curiosity and wonder, Ingold has overlooked, it seems to me, with statements such as "you only go *inside* a place to die" (2007:100), an important though easily forgotten aspect of human experience.

Besides traces and threads, Ingold proposes a third category of lines: "ghostly lines," those that in a sense are "more visionary or metaphysical," such as those we imagine as we link stars into constellations and survey lines used to link triangulation points (2007:47). Here again cave surveying requires we reconsider the explanatory power of this taxonomy. While the orientation in degrees of survey lines drawn in a sketcher's notes obtain their value from a compass reading that aligns directionality with a grid that in fact has no empirical counterpart in the real world, this orientation also roughly maps onto the *actual* traverse of explorers within a cavern's often irregular inner surfaces.

Ethnographic accounts of cave surveying and mapping question yet another one of Ingold's arguments in his comparative anthropology of the line. Beginning with the contrast between a trace, such as the continuous freehand mark we might make with a pencil on paper, and a connector, another kind of line formed by connecting the dots, a set of dichotomies again ensue (Ingold 2007:73-103). On the one hand, the trace is dynamic, such as the one made as we go on a walk, as we move along a trail, carefully noting what we find along the way as we inhabit the world. In the sketch maps we make, these traces, these journeys are not erased. They are, instead, an integral part of our representations. Many traces, at times coming together, each representing individual life trajectories, make up what Ingold calls a meshwork (2007:100). On the other hand, a connector is static, with each of the segment lines in a hurry to get from one spot to another, not caring much about what lies between. No longer taking the line along for a walk, the connector better defines the business of the navigator (as opposed to the wayfarer) who transports goods from port to port, or the traveler whisked from place to

place contained in a fast-moving vehicle that does not move "*with* time," but "*against* it" (2007:102). Connectors as ways of life, the argument goes, have become ubiquitous markers of modernity. Cartographic maps, in which places are marked by dots, are symptomatic of this condition (2007:96).

Yet, these distinctions assume a connector's dots as given. Cave surveying makes an important exception. As caving teams traverse cave passages, and the sketcher diagrams the line plot in his notebook, dots represent the survey stations that, as I have already described, result from a complex negotiation between the cavern's inner form and the group's physical capacity to make its way along. In practice, the points at which the tape leader decides to create a survey station are moments of relative rest. They also are the points at which the survey team members face each other in their coordinated effort to assess the characteristics of the passage just traversed. Did it go up? Did it go down? How long is it? What is its orientation? The segments that the sketcher draws connecting these points roughly parallel the team's actual passage through the cavern. For those who embrace an ecological ethic, the aim is to move along carefully, following along the path trail-blazed by the tape leader—to step where she has stepped, to heed her suggestion to hang the head low at a point with delicate formations glistening from the ceiling—in order to minimize the impact on the cavern. This in no way denies the deeply embodied and engaged relations among explorers and cave.

The final version of a cave map typically does not include the line plot, or, in the words of the SVE members, *la poligonal*. Instead, the lines of the final representation are those lines that emphasize the cavern's inner contours. For some scholars, this "edit" could be interpreted as a move to erase human engagements with place. For others, it

might be just another deceiving gesture aimed to suppress human practice and instead show an objective representation of the cave "as is." I suggest, however, some alternative interpretations: Could the erasure of the line plot be read as an acknowledgement that what matters in the speleological pursuit is the cave and not those that explore, survey, and at times even discover it? Could the emphasis on a caverns' inner contours as opposed to the surveyors' traces be an acknowledgement that different teams might produce slightly different line plots (with different, more, or less survey stations) and yet, at the end, result in similar approximations to the cavern's actual shape?

The views these maps confer are filled with the perils of representation that many have directed at cartographic practice. As Doreen Massey reminds us, there is the ever-present danger of seeing representation "take on aspects of *spatialisation* in the latter's action of setting things down side by side; of laying them out as a discreet simultaneity" (2005:23). Massey's concern here is the pervasive conceptualization of space and time as opposing tendencies, with representation of space understood as taking time out of space. Maps, as all representations, are selective with regards to what elements of reality they symbolically incorporate. By definition, then, maps flatten and simplify reality, often committing acts of erasure of undesirable or simply ignored elements of what is out there in the world. As such, maps are tools of power (Harley 1989; Wood 1992). Cave maps also court the perils of scientific representational practices that tout detached objectivity, their products (maps, reports) editing out undesirable elements, e.g., the "human" elements that "muddy" science but are, inevitably, part of its practice (Latour 1999). In the context of colonialism and nationalism, maps have been crucial to imagine and exercise the capacity to demarcate and appropriate land and everything contained

therein (i.e., Mignolo 2005; Burnett 2000; Winichakul 1994). They have also been viewed as critical components in the construction of imagined communities (Anderson 1991; Radcliffe and Westwood 1996).

Ironically, many of these critiques run the risk of fetishizing maps by detaching them from the very processes that produce them and the landscape in which they are produced. Viewed within this context of production, use, and landscape, the map opens up to alternative readings of our relation (both real and imagined) to place, our attempts at its representation, and of course, our analyses and understandings of these processes. Some scholars, however, have proposed these alternative readings, as they focus on the experience of explorers, cartographers, and scientists enmeshed in their cartographic endeavors. In *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado* (2000), historian of science D. Graham Burnett presents a thorough and critical history of the exploration and mapping of British Guiana, in an effort to "explain how European explorers turned areas they called terra incognita into bounded colonial territories" (2000:xii). Burnett acknowledges Paul Carter's *Road to Botany Bay* (1988) for highlighting this shift in scholarly perspective since Carter "identif[ies] the radical difference between spatial perspectives of an explorer on the one hand and those for whom exploring was done on the other" (2000:10). Carter's work helps dismantle the notion of a homogeneous imperial view, or "the whole of imperial exploration and mapping as a sweeping 'strategy' of European imperialism" and finds, instead, internal tensions and the need for a closer examination into cartographic practices (Burnett 2000:11). As becomes clear in Burnett's own work, the history of cartographic practices and representations of British Guiana require we accompany the explorer/surveyor (and

all of the tensions that slash conceals) along his engagements with the land and its people. This perspective has important consequences on how we analyze and come to understand the relation between space and history:

Explorers perceived the manifold oversights within the feigned oversight of the imperial gaze. A history that recognizes this, Carter lets on, would be a way forward in the wake of empire. Such a history would reject the 'state convention' depictions of space that made empire possible and that (he argues) are regularly recapitulated by standard imperial histories. [Burnett 2000:12]

Often lost in accounts that malign cartographic representations as tools of power, erasure, and potentially, appropriation, is that they are themselves a result of a creative and imaginative process (which does not automatically make them benign) (Cosgrove 1999). The degree to which this is so varies immensely. Cartographic techniques have become highly standardized and sophisticated, with technologies often reducing to a minimum how involved a mapmaker becomes with the object of representation. The point here is that it is worth examining what is it that cartographers are making representations of, and precisely how it is that they go about producing such representation. This emphasis does not deny the critiques leveled at maps and scientific representations (and the powerful ideologies that buttress their production and circulation), but it does help sneak back in some oft-dismissed points, such as the role of creativity and imagination in these processes, and, as in the case of caves, the limits of our vision and our technologies to grasp and order nature.

Consider the often vilified “view from above” (Pratt 1992). As Massey notes, “[n]ot all views from above are problematical—they are just another way of looking at the world” (2005:107). Indeed, views that attempt to step beyond our grounded perspective exercise our imagination, our attempt to approach, although never fully

reaching, an objective stance (Nagel 1986). “The problem only comes if you fall into thinking that that vertical distance lends you truth” (Massey 2005:107). To the caver, this vertical distance, this plan view projection, enables him to find his way, to make a better informed decision of where passages might go, of asserting where he has been. Cave maps, of course, do more, such as signaling a community of practice’s allegiance to a particular ethic of exploration and a particular perspective on space, on nature. But paying attention to the ways these maps are produced and the specific environments where this production takes places reveals a no less embodied, engaged, and collective endeavor simply because they tout some degree of objectivity, of science. In fact, many cavers emphasize the sensual aspects of their practice, and in no way see this as a threat to their cartographic and geological knowledge (Cant 2003; Watson 1994).

Conclusion

The only way to produce cave maps is to explore caverns in the first place, to figure out “where [they] go” (Watson 1994:6). This emphasis on exploration is one that cavers themselves have alluded to when describing why they do what they do. As U.S. caver (Red) Watson describes it,

[c]avers rarely have a goal beyond exploration itself. Not ‘Because it is there,’ but rather ‘To see where it goes.’ Some cavers do explore to connect caves, or to find enough depth or length to make their cave the deepest or longest, but the vast majority do not have these ambitions, and couldn’t be cavers if they did because of the very limited possibilities in the world for big connections and depth records. [1994:6]

In fact, producing maps is a goal that more and more cavers, regardless of “speleological ambitions,” have embraced as an integral part of their caving activities. After all, as cave systems become more and more complex, maps are necessary tools to “see where they

go.” Thus, exploration and cartographic practice must be understood dialectically.

Competitive sports cavers, just as speleologists, need accurate maps to show the extent of their physical feat. In their case, exploration records are based on the shared assumption that "sport records are set only through actual exploration" and that "[f]or a depth or length measure to count, a caver must have traversed it" (Chabert and Watson 1981:7). Exploring and surveying are the flip side of the same coin in the quest of defining both space and one's own relation to it. Embracing this dual commitment as one traverses cave passages also characterizes individuals' identities either as speleologists or sports cavers who are part of a larger and recognized community of practice. As will become clear in the coming chapters, mapping (and then publishing these maps) becomes fundamental in the identity of the Venezuelan Speleological Society's ambitious project of a national cave registry. No less critical in understanding this ambition, and the ability for this group to sustain its activities for over 40 years, is the sensual and collective experience of exploring the underground.

Cave maps not only are representations of a peculiar environment, but also of a social practice marked by distinct human spatial relations and technologies of perception (and the limits thereof) (Mueggler 2005:725). I have suggested that careful consideration be given to the specificities of the environment in which these activities occur, for they have direct implications on how individuals engage with each other and with the object of their inquiry. This engagement is intimately tied to the process of knowledge production and representations of space. It also has the potential of nurturing bonds of friendship as explorers trust their safety on each other as they explore and survey the underground. Moreover, as the case of the Venezuelan Speleological Society makes clear, it is

important to think of exploration and mapping dialectically, with both activities defining both caves and *la Sociedad*. Without understanding the precise conditions of the making of these maps and what they are representation of, we might drown out the social, material, and historical specificities of this practice. Lost too is the chance of a more nuanced analysis of and appreciation for the range and intensity of human lived experience in the world.

Chapter 5

Reading Cave Maps: Correspondence, Continuity, and Growth of the Speleological Cadastre of Venezuela

Knowing that I was working on my dissertation research in the Caripe area, Manuel Carrillo, a geology graduate student, asked me if I could obtain stalagmite samples for a climatological study from a small cave near Caripe.^{1,2} He could not go himself because of a recent back injury. During an SVE meeting in Caracas, he and Franco Urbani (his advisor on the project) explained what I needed to look for and the procedures for obtaining the required samples. They suggested I do this in Eduardo Röhlh Cave. The fact that it was located outside of the park, Urbani noted, would mean there would be no problem getting the work done (e.g., no need for special permits).

Manuel pulled out the SVE bulletin volume containing the cadastral entry of this cave. Its entry abbreviation is Mo. 12 (with "Mo." corresponding to Monagas state and "12" to the fact that it was the twelfth cavern in the state surveyed by the group). I learned that Francisco Pérez and Benjamín Magallanes had surveyed the cavern in 1973. I had already met Magallanes during my work in Caripe. He had worked as a Guácharo Cave guide for many years and had offered invaluable support to the speleologists in their

¹ Manuel Carrillo is a pseudonym.

² In recent years, geologists and climatologists have turned to cave stalagmites to study changing climate patterns, in a similar way that researchers study the rings of ice columns extracted from the arctic ice caps. The concern of over-sampling and improper sampling techniques has led to a concern within the international caving community.

explorations. The prospects to having Magallanes accompany me on this venture immediately sparked my interest. “Perfect ethnographic opportunity!” I thought, especially if he could recount his experience aiding SVE member Pérez as we explored the cavern together using the very map he helped create. From the entry I also learned that the cave is 263 meters, and that it also is known in the area as "Teodorito" and "The President" (SVE 1974:100-101).³

With my photocopy of Mo. 12’s cadastral entry (description and map), I headed back to Caripe. But as I soon realized, using this information to guide myself in the field, both to the cave and then *inside* of it, was no simple matter. I was able to bring Magallanes along, but he could not remember the specifics of that cavern he helped survey over 30 years ago. Time had also abated his desire to get muddy to help confirm a correspondence between the cave on paper and the one we eventually entered.

In this chapter I describe this and other attempts to read the Speleological Cadastre of Venezuela. This reading takes place both within and beyond the very caves it aims to represent and order within a particular system of knowledge. This reading takes different forms. As in my visit to (what I *think* was) Eduardo Röhl Cave, my “reading” attempts to find correspondence between the representation and place in the world. It emphasizes an understanding of humans’ engagements with place as relational, temporal, and multiple (e.g., Massey 2005). Where do the map fit in this relational approach? I argue we consider these engagements in dialectic with representations (Csordas 1994).

³ The first speleologists who explored this cavern to its end were, at the time, members of the Speleology Section of the Venezuelan Society of Natural Sciences, who, led by Eugenio de Bellard Pietri, opted to name this cave in honor of a famous Venezuelan naturalist (Eduardo Röhl). Respecting the precedent of this exploration, the SVE maintained this name in the cadastre.

This includes *both* their symbolic *and* material qualities, since representations also are things with social lives (Appadurai 1986; Keane 1997, 2003; Hull 2003:290-292). Thus, their materiality also must be considered in our analysis of human experience (Mueggler 2005a, 2005b, 2011). While the past chapters have focused on the process of producing these representations (defining survey standards, mapping in the field), here I turn to their multiple and sometimes contentious readings.

Other cases illustrate the complexities of this process of reading, such as the experience of us newer SVE members during the 2008 Alto de la Palencia expedition already mentioned in Chapter 3. I show our efforts to gather from the Cadastre the necessary information regarding previously surveyed caverns in the area we were about to visit. Reading this information in the field proved even more challenging. I consider as well ongoing efforts to pool all cadastral entries into one computerized database. The goal is to produce a country-wide map with the location of all surveyed caverns. Here again, challenges to read the cadastre emerge. These cases show how readers' capacity to read and use this registry depends not just on the validity of the representations, but on the way knowledge is ordered and the ease with which it is retrievable. In this analysis I build on the work of science studies scholars Michael Lynch and John Law, who consider parallel challenges that bird watchers face in the field (1999[1988]).⁴ As they argue with bird watchers, SVE members' challenges are not just epistemological, but also social as we strived to *become* speleologists and not mere leisure hikers or eco-tourists. Not only were our identities as members at stake in the ways we enacted speleological knowledge in the field, so was the continuity and growth of this knowledge. With continuity I mean

⁴ This work was originally published in 1988 in the journal *Human Studies*. Here I quote from the reprinted version in Biagioli 1999.

the challenges of keeping past knowledge alive by its constant use. As it turns out, having surveyed caves once and published their maps is not enough to ensure its livelihood.

With growth I mean the commitment of newer members to acquire the necessary skills to explore further, to survey new caves, and to include them, as many had done over 40 years, in the Speleological Cadastre of Venezuela.

Experience/Representation

A number of scholars have addressed contrasts between realist and constructivist perspectives in social research (e.g., Csordas 1994; Ingold 2000; Hacking 2001; Jackson 1989, 1996; Latour 1999; Ness 2011:71-72; Tibbetts 1988). While I align myself with those who privilege human experience in the world (a realist perspective), my ethnographic case takes this further with the need to consider human experience beyond the habitual, the day-to-day qualities of such experience (e.g., Bourdieu 2000[1972]; Feld and Basso 1996; Ingold 2000, 2007; Knapp and Ashmore 1999). Yet, to privilege a realist perspective does not mean rejecting constructivist points of view. Both anthropologists and human geographers have made this point. Already in 1994, even as he called for analysis of embodied practices that views humans as being-in-the-world, Thomas Csordas stressed that this does not replace anthropological focus on representations (i.e., language, texts) (1994:9-11). Instead, they should be viewed together, so long as the representational view does not drown out our capacity to acknowledge and examine the immediacy of human experience (Csordas 1994:20).

Similarly, some human geographers have cautioned against this either/or approach in what Nigel Thrift calls non-representational theories (1996).⁵

Science studies scholars also have been concerned with the realist/constructivist debate, although their focus predominantly has been on the issue of representation of scientific knowledge (Hacking 2001; Lynch 2002; Lynch and Woolgar 1990; Latour 1999; Tibbetts 1988). They have addressed, from many different angles, old philosophical questions regarding epistemology, such as how it is that we come to know what we know of the world and whether or not the knowledge (representations) we produce of the world is accurate. In contrast to philosophers, however, science studies scholars ask these questions as they analyze specific case studies (as opposed to dealing with them in the abstract) (Lynch 2002). As soon as sociologists, anthropologists, and historians began to meddle with these topics, however, strong (and often bitter) reactions ensued, particularly from scientists who saw their enterprise critiqued and attacked (and by non-specialists, no less) (Latour 1999). Even among social scientists, the debate has been fierce regarding the proper domain of sociological explanations of scientific practice.

Some propose models that explain scientific knowledge in terms of social constructions (i.e., primarily, if not exclusively, the result of actors agreeing on what this knowledge is). Others, in contrast, suggest a realist basis for such affirmations. This basis is “external” to the social vicissitudes of practitioners (Hacking 2001; Latour 1999;

⁵ Lorimer (2005) would have preferred a different term, such as “more-than-representational,” since the issue is not a rejection of representation but of broadening/shifting the conceptual and methodological toolbox to acknowledge and examine human experience as process that at least at some level might be pre-symbolic, pre-cultural (Macpherson 2010:2).

Tibbetts 1988). This is, admittedly, a schematic simplification of positions, the kind that has been referred to (and caricatured) as the Science Wars that peaked in U.S. academic circles in the 1990s (Latour 1999:15). In fact, many scholars have produced nuanced and thoughtful analyses that go beyond the trite “either you believe in reality or you don’t.”

Already in 1988, Tibbetts had argued for moving beyond these all or nothing positions. In his view,

[there is no need to commit] to either a realist or a constructivist account in a mutually exclusive sense; elements of both in fact appear in most writings on the subject. The contrast between constructivism and realism is the emphasis respectively given - or not given - to the social contingencies surrounding RDs [representational devices, such as pictures, maps, graphs] and associated evaluative criteria, and the supposed epistemic independence of the data points from such considerations. [Tibbetts 1988:118]

He dismisses the “either-or” character of the realist-constructivist debate as a “red herring,” and suggests instead we focus on the extent to which realist and constructivist elements are mutually at work and interactive in the design and utilization of RDs (representational devices) in scientific contexts" (Tibbetts 1988:119; see also Hacking 1983, 2001).

This is the perspective that Michael Lynch and John Law take in their analysis of bird watching practices (1999[1988]). I summarize their case (which goes beyond the domains of institutional scientific practice and into the field): A novice joins an expert bird-watcher for a walk around a pond. With binoculars and field notebook in hand, they try to identify as many birds as possible. The novice left her bird field guide behind, so she relies on the knowledge of her expert companion for proper identification. Soon, problems ensue. First, birds often are difficult to see clearly (and long enough) in the distance. While the expert birdwatcher may point out that the duck in the marsh is a

gadwall, the novice feels trepidation to add “gadwall” on her birding list. For, although she sees the bird, would she be able to identify it when she sees it again? Will she remember how to distinguish this bird from another? To Lynch and Law, the novice’s “problem is to get the name ‘to stick’” (Lynch and Law 1999[1988]:318). If she at least had at her fingertips (or better yet, in her head) “a compact device *collecting and contrasting species identities*” or some other form of “synthetic *table of possibilities*” listing the names of and characteristics of birds in the region, her experience may have been more productive; she would have been able to get those names to “stick” (Lynch and Law 1999[1988]:319). The closest thing to such a case is having an actual field guide with her. However, as Lynch and Law suggest, this is not without its drawbacks. Field guides can be too large and clumsy to use in the field. If one does not know what bird is out there, then how does one navigate through the index of possibilities in the book? Birds rarely pose long enough for the curious onlooker as he fumbles through pages with text and pictures. The arrangement, kind, and quality of these texts and pictures matters as well. Lynch and Law compare three guidebooks representing the schematic, photographic, and dioramic modes of picturing birds in the text. Handled in the field, each has its positives, but also its negatives.

To Lynch and Law, this bird watching episode

[b]rings into relief the way in which “experiencing the meaning of words” in a specific naturalistic domain requires an apprenticeship to a social organization of reading and writing. More generally, an examination of this game enables us to appreciate how “natural order” is discovered and organized through the use of texts. It also enables us to appreciate that “natural kinds” are not simply representations of what the eye (or mind’s eye) sees. In place of a perceptual model of observation, we suggest open-ended investigations of *situated practices of reading and writing*. [1999[1988]:319]

These practices “require an active consultation of texts as part of the embodied performance of a socially organized activity” (Lynch and Law 1999[1988]:320). A novice bird watcher might attempt to read her field guide, or, as the case the author describe, follow the guidance of her expert companion. With this information, she attempts to find correspondence between this information and what she perceives. She tries to link words and things. Lynch and Law’s open-ended investigation of this situated practice of reading and writing (in this case, annotating in the field notes the birds identified in the field) suggests that “bird-watching is not a naked matter of looking and seeing.” Instead, it is an activity that requires constant back and forth between textual sources of information (field guides), tools that aid one’s perception (binoculars), time, and patience. Moreover, “the outlines of the game differ significantly when it is played along, by groups of novices, and by groups of experts” (Lynch and Law 1999[1988]:320).

This bird-watching analysis emphasizes the “reflexive relationship between the literary phenomenon of the list and the embodied and interactional performance of observation and representation” (Lynch and Law 1999[1988]:321). The relationship between perception and the natural world resists over-simplification when examined in practice. This does not deny the reality of the natural world, nor the human capacity to perceive it and know it. However, these capacities are not automatic givens, but processes that “[depend] heavily upon the textual, interactional, and authoritative production of lists” (Lynch and Law 1999[1988]:321).

I describe this case at length because it provides productive counterpoints to the different ways of reading the speleological cadastre. First, both cases involve practices in

the field, in spaces that are less structured or controlled than the laboratory, the more classic “site” of scientific production. In both cases, these field practices are accessible to the amateur (and the ethnographer) (Kuklick and Kohler 1996). As in the case of bird identification, identifying caves in the field rests on the criteria and knowledge produced by a relatively well-defined community of practice.⁶ Again in both cases, the design and materiality of the authoritative source of knowledge (the field guide/the cadastre) critically impact the experience of putting this knowledge to use. This last point raises not only the issue of how, but of why: What is the purpose of this knowledge? I turn to this question in the conclusion.

Reading the Cave Map

The complete cadastral entry of Eduardo Röhl Cave (Mo.12) reads:

State: Monagas. *District:* Caripe.
Geographic coordinates: Long. 63° 31' 15" W; Lat. 10° 12' 43" N.
Consulted map: Sheet 7446, Cumanacoa, Dir. Cart. Nac. [National Cartography Office], Scale 1:100.000, 1° edit., year 1964.
Entrance: 1,310 a.s.l. [above sea level]
Horizontal development [total length]: 263 meters.
Vertical extent: 27 meters.
Surveyors: F. L Pérez, B. Magallanes, 12-20-1973.

Descriptive location: The cave is located south of La Guanota, taking a right at the second road split once one enters the hamlet. Then one continues walking for 1,200 meters in ESE direction.

Description: The Eduardo Röhl cave is also known by the names "Teodorito" and "The President."⁷

⁶ Although as I have already argued, this might be less so among speleologists than ornithologists.

⁷ The first speleologists who explored this cavern to its end were, at the time, members of the Speleology Section of the Venezuelan Society of Natural Sciences, who, led by Eugenio de Bellard Pietri, opted to name this cave in honor of a famous Venezuelan

It is formed by six main salons, following the general W-NE direction. The mouth of the cave, 7 m in width by 4 high, gives way to a salon with large blocks on the ground, that in turn communicates by a soft incline to a second salon, 10 m high and with a small lateral gallery along the north face.

Going up a 2 m escarpment, after a small stretch of a gallery with stagnant water, one arrives at a third salon that has various water ponds and one small bat colony.

The next salon is a very wide *laminador* [a wide gallery with a minimal height that forces the explorer to lie on the floor to traverse it], with a 55° slope and rocky walls for the most part.

To arrive to the fifth salon, the conditions are similar to the ones of the previous salon, one has to cross narrow passes. Lastly, and going up a small slope, one arrives to the 6th and last salon, the largest in the cave, with a maximum height of 15 m.

There are numerous speleothems in all salons of the cave, but in this last one finds the greatest number, with a column 3 m in diameter and some 10 m in height at the center, and one gallery some 15 m in height and 17 m in length, that one reaches going up a 4 m escarpment. At this point two descending galleries open up that communicate with a lower level where a small water current runs. The greater of the two communicates by means of an 11 m chasm that is closed off at the end with breakdown.

The cave is well known in the sector. [SVE 1974:100-101]⁸

A corresponding map accompanies the cave's description. In anticipation to how I was to use it in the field, its materiality became a matter of concern. The map is printed on an inserted 8.5 by 11 in sheet folded in half to fit the journal's format. I welcomed the manageable size, since I had to make copies of it to take to the field. Taking the actual volume would have been a bad idea. Not only would it have been more cumbersome to

naturalist (Eduardo Röhl). Respecting the precedent of this exploration, the SVE maintained this name in the cadastre.

⁸ The elements of these cadastral entries changed slightly after the 1975 meeting among Venezuelan speleological groups I describe in Chapter 3. Note for example that we have no assessment of the survey quality.

hold as I explored the cave, there are only a few early BSE bulletins available of their original 500 run from the early 1970s. It would have been a waste to take it into the cave and trash it in the process. In contrast to the bird watcher, I did not need to worry about identifying a phenomenon as one of many possibilities, a representative of its species. There only is one Eduardo Röhl Cave, as opposed to one gadwall of many of its kind. My challenge involved finding and identifying *that cave*. Thus, in my case, no need to have in my fingertips “a compact device *collecting and contrasting species identities*” or some other form of “*synthetic table of possibilities*” (Lynch and Law 1999[1988]:319). If I failed to establish correspondence between the cave represented and the one located and explored, I would have to get out and locate and explore another nearby.

The map of Eduardo Röhl Cave contains both a plan and profile view at a 3 cm = 15 m scale. Three cross-sections offer yet another perspective of distinguishing passages of the cave. Both plan and profile views contain reference points marked with letters to help the map reader find correspondence between both cave perspectives.⁹ Both cadastral maps and bird images in the bird guides that Lynch and Law analyze use a “picturing model of the RD-RO relation,” whereby the RD (representational device) “graphically resembles” the RO (represented object) (Tibbetts 1988:120). Precisely what it means to “graphically resemble” is open to many possibilities. I already have attempted to describe what the various cave map perspectives represent (see Chapter 2 and 4). I concluded that these representations involve a number of imaginative leaps that construct a perspective that is not like anything that is “immediately” perceived or experienced as one traverses the cave landscape. And yet, the lines of the map *do* attempt to trace real

⁹ See Chapters 2 and 4 for a description of these views and the perspectives of the cave they aim to represent.

forms in nature that would be perceptively evident *if* we could slice the cavern along horizontal, vertical, and perpendicular planes. Lynch and Law analyze the various “representational devices” adopted by each of the guide books they analyze. Schematic drawings of birds have the benefit of allowing artistic license to emphasize key features that will help the bird watcher identify the species in the field (Lynch and Law 1999[1988]:323-327). Drawings also ensure consistency: all birds are shown with the same pose. However, rarely are birds *seen* in the field in the ways depicted in these drawings. Other guide books opt for a more naturalistic representational device, such as photographs in the field. This gives the advantage of providing the context of the bird’s habitat (if the background of the image is not knocked out), but loses the accents and consistency that make the drawings effective (Lynch and Law 1999[1988]: 327-329).

In my experience viewing cave maps, there appears to be less diversity of representational devices when it comes to representing caves. The basic notion of the plan, profile, and cross-sectional views remain the norm, or at least the foundation, of the way caves are represented in the speleological community. Technology (and creativity) have made other “views” possible, however. Computerized images of the caves’ volumes are increasingly common, but the benefits of such a view are usually lost in print. Cave photography has been part of speleological pursuits for over 150 years, but it usually provides accents that complement the textual description of a cavern. As I have already noted, cave photography involves an arduous process that is both technical and creative. It is also time consuming. Rarely are survey teams also photographing the caves they aim to represent. However, for caves that have entrances or geological formations that are out

of the ordinary, a photograph certainly aids the process of establishing correspondence. This was not the case with Eduardo Röhlh Cave.

After receiving Carrillo and Urbani's instructions on sampling in the SVE headquarters, I studied the Eduardo Röhlh cave map. There, in the musty basement of a Caracas residential building, my immediate concern was not whether the cave corresponded to reality. That would come later. Assuming this was an accurate representation of the space I had already agreed to explore for rock samples, my issue had to do with *me*, my exploration skills, by body, in relation to the cave. Any tight "squeezes" through which I might not go through? Any black pools to wade that would suspend my body over unknown depths? Any big drops or vertical pits that would require electron ladders or climbing equipment for major rappels and ascents?¹⁰ Running my fingers along both the plan and vertical views of the cave, the answer seemed to be "no" to all of these potential hurdles. The description's assertion that "one has to cross narrow passes" from one salon to the next worried me at first. However, checking dimensions I concluded that I had endured far worse spots during my limited experience underground. Yet, I could not trust my judgment. I struggled transforming these black lines into volumes, volumes that I tried to imagine in relation to my body and its size, its strength, its skills. Whether or not I would be able to handle my fear of darkness was another matter.

The scalar—indeed, the phenomenological—relation between the bird watcher and the bird contrasts dramatically to that of explorer and cave. The bird watcher is a distant observer; the explorer an intruder in a space that contains her. The first relies

¹⁰ I describe how cave explorers utilize this equipment in Chapter 6.

primarily on vision (and sound) as the primary senses of perception engaged in the process of identification. For the second, vision is no less important (getting caught deep in a cave with no light could be disastrous). Audition may be critical when determining the proximity to an underground waterfall or river. The smell of damp sand or decomposing vegetation brought in by rain often overwhelms. Is it touch, then, that becomes the driving sense in the process of identification of caves? I suggest moving away from thinking about the senses in disembodied isolation. What is critical here is the explorer's capacity and willingness to *explore*. As I did in Chapter 4, again here I emphasize thinking of this activity as humans' (although not solely human) intentional probing of the landscape. To Tim Ingold (2000), this is an event, a process whereby "body and landscape are complementary terms: each implies the other, alternately as figure and ground" (Macpherson 2010:3). Even this description falls short of what I hope to convey. The terms used must contain *movement*. The notion of the body's "emergen[ce] through its 'interweaving' with the world" gets closer (Macpherson 2010:4; Damasio 1999; Deleuze and Guattari 1987). In this process, not only is the explorer "reading" the landscape, since "reading" primarily implies visual practice that transpires in one place. Feeling along? Too passive, too "soft." Perhaps best to embrace concepts put forth by Non-Representational Theorists, such as thinking of the "physical body and sensations [as] on the move, interconnected with other bodies and contexts [which] means our sense of embodiment is dependen-dant [sic] on how our body is put to use" (Macpherson 2010:4). What this perspective leaves out is the sense of *newness*, the sense of the *unexpected* that so profoundly characterizes traversing a cave. I am left with no better alternative than to go back to *exploration*, which captures the sense of purposeful

movement, sometimes involving great effort and risk, through an unknown space that at times *resists*. This exploration leaves imprints on both body and place (Ness 2011:83). Indeed, from repeated explorations, a cavers' body transforms: it becomes stronger, more nimble.¹¹ As much as the conscientious cave explorer is careful to tread softly, the cave environment is impacted.

If there is such a thing as a cartographic reading of “anticipated embodied experience” this had to be it. This embodied experience would not be primarily about which way to go, how to get from point A to point B, what things I would find and see along the way, or even how to orient myself and select a path in a given space. At least in this case, the cave appeared to be small enough, dispelling concerns about getting lost. Most likely, the cave's inner contours would likely determine (or at least highly delimit) my “path.” I read the representation before me as that of a space that would contain me, challenge me, surprise me, and at times even scare me. While it gave me some idea of what to expect, that was hardly reassuring.

For my first visit to Eduardo Röhlh Cave, two people accompanied me. The first was the veteran Guácharo National Park ranger Blas Salazar. Always concerned about my safety, he stressed coming along. He was the one who suggested having Benjamín Magallanes to join us.

From Magallanes's small home located in the town of San Agustín, we took a short five-minute cab ride to the small town of La Guanota. We did our best to follow the description of the location of the cave noted in the SVE bulletin, realizing that it could be

¹¹ During my training in a cave geology course in Kentucky in 2004, a woman classmate commented with pride on the bruises on her body. For her, they were signs of having enjoyed an intense caving day.

outdated. I had no GPS reader, so I could not compare satellite coordinates to those in the text.¹² Magallanes could not remember how to get to the cavern, either. As soon as we veered right off La Guanota's main road, we walked by a lush watercress plantation with men working in knee-high water collecting the crop. We asked if anyone knew where the Eduardo Röhlh Cave was. The request elicited blank stares and shrugs. "What about Cueva Teodorito o Presidente?" I asked. This time one of the men, a teenager, came towards us and offered to guide us. He said it would take 15 minutes to reach its entrance.

Encouraged, we followed him across more farm fields and up the southern hills of La Guanota's fertile valley. The path leading up to the cavern was barely visible through the vegetation. Yet, once we arrived at its mouth it was clear that people visited the place. There was graffiti and trash (plenty of soda cans and beer bottles) both in and out of the cave.

I asked Magallanes if he recognized the cavern from its entrance, but he seemed doubtful. As he explained, he had not been here for a long time, perhaps since that December day in 1973 with SVE member Francisco Pérez on that survey trip of caverns along the ridge. Perhaps he would recognize it once inside, I thought optimistically. Yet, both Salazar and Magallanes turned back as soon as the main passage required stepping through a narrow point filled with water and mud. Fortunately, our young guide offered to accompany me inside. I would not have gone in alone. Salazar and Magallanes decided to wait for us at the entrance.

¹² Even this would need to go through conversions to get at some basic correspondence, since the coordinates used to locate the cave in 1973 are based on the system used by the 1964 map, which is not the same system used by GPS. Moreover, the thick forest vegetation of the area may have made getting a satellite reading virtually impossible.

I pulled out the copy of the cave map that I carried in a plastic bag in the chest pocket of my caving overalls. I focused my headlight on it. Is the cave we are standing in and traversing the *same* cave that SVE surveyors mapped in December of 1973? Does this map represent this space I am *in*? I tried to locate a prominent feature of the inner landscape that I could see, given the range of my light. I then tried to find a match on the map. Precisely what constitutes a “prominent feature,” however, is subjective. How much detail of bulging rocks, stalagmites, and stalactites a surveyor includes in his sketchbook varies immensely. Too much detail would crowd the graphic and make the general inner contour of the cave ineligible. My effort at matching a single feature in the cave to the map was very difficult to do. So I shifted tactics. With cave map in hand, I strained my eyes, trying to make sense of the predominant inner form of the cavern. I soon resolved it would be best to go in as far as we could, and then, with a better idea of the cavern's whole, turn back and read the map from back to front. This had the advantage of shifting perspective from specific points in the space to *sensing* trajectories. As my body moved along, I could begin to feel/imagine a form coming into being. The floor slopes down, then up again. At some points, whether I focused on points or trajectories was less a matter of choice and more a matter of necessity. Where the floor sloped and the passage narrowed, I needed my hands free to hold on, push along, and through. Forget the map!

I moved along while dealing with my own anxieties about lacking the company of a caver more experienced than myself. My companion was a complete stranger. Such anxieties mixed with the physical effort of pushing along, especially through the three tighter angled passages that challenged my body: there were no hand or footholds. Here, we helped each other, holding our hands and feet to keep each other from slipping down

the steep incline... slipping down to who knows what. Soon I was drenched in sweat. The cave's passage was damp and muddy. Still, we managed to move ahead, eventually reaching what I would later know, with more certainty, to be the cave's final main gallery.

I stared at the map. If this was not the same cave, then it had to be a very similar one to the one represented on paper. As its most distinguishing features, the three tight and angled passages seemed to match. The drawing of the last final gallery included a thick stone column in the middle of the room, and there it was, next to us, as we scanned the place with our lights. I decided to turn back. I told my brave companion that it was not prudent to carry on: the cave seemed to continue along two narrower legs, much like what the map suggested, but they were not easy walking passages, their vertical distances requiring some climbing (so, according to the map, we did not descend to the second level). We also did not have much light. I brought with me the recommended three sources, but I had left one with Salazar and Magallanes, and the other I gave to my companion. As we made our way out, the cave seemed much smaller than what we encountered on our way in, a result, most likely, of familiarity, of knowing what to expect. I also paid more attention to formations. The farther one was in the cave or along the extremes of the passage, there were more formations standing, most seemed small and somewhat amorphous in shape. And of these, the best ones would not be easy to get to. What to do? I tried taking some photographs, but knew that I would have to return. At least for that day, I was content to have made it this far: locating what we believed, with guarded certainty, to be Mo. 12.

Some of the challenges I faced that day in La Guanota involved classic epistemological problem of establishing correspondence between reality and representation. Was the cave I was in the same represented in that cadastral entry? What precisely was the relation between the “RD” (representational device) and the “RO” (the represented object) (Tibbetts 1988:117)? Chapter 4 addresses the process of making cave maps. Here I focus on the process of reading the cave map, both prior to arriving at the field and then the experience of finding and traversing the cave. In my account I have pointed to the process of “reading” a representation that has both symbolic and material qualities. These qualities intertwine, in practice, with the cave’s own physicality and by own. Together, at the rhythm of my own traverse alongside my companion, a spatial cognitive and affective appreciation comes into being. I never perceive or sense the cave *in its totality*. I do so only piece meal, slowly, between shrugs and grunts as I chug along. My light only shines where I focus it, its intensity a function of the LED bulb, the battery that feeds it, the changing volumes of the cavern, and the reflective quality of the inner stone.

I could have brought a measuring tape and measured the length of the passages. This could have reduced the guesswork. Most of the passages did not allow for much room to move, so the paths I took must have been very similar to the paths the 1973 surveyors took. Their actual survey stations are not marked in the final map. These graphic clues of the itinerant quality of the map-making process have been erased from the final map. For erasures such as these, some scholars accuse the map of editing out the processes and experiences involved both in their production and reading (de Certeau 1984:121; Ingold 2007:100-103). Here’s an alternative interpretation: By not depicting

their exact survey traverse, I felt unconstrained to follow their exact path. Not that this mattered much. Again, the cavern's inner contour did not allow for much room to maneuver. As a "blank" template, the map could suggest, "Welcome, go on ahead, and discover your own cave, make your own path." Recalling the limits of exploration and representations of caves, it was not impossible that some passage may have been passed up, or even, that blocks had shifted. Regardless that others had been in that space, measured it, and sketched it, every move, every encounter was new *to me*, to my body in motion, to my mind imagining wildly, not quite sure what to expect.

Reading the Cadastre

The SVE periodically has published a listing of all of the caves featured in the cadastre. The 40th volume *Boletín* has one of these lists, with entries organized alphabetically by state and survey number. Still, locating these caverns on a map requires finding their entry in the volume where they appear, their coordinates, and transposing them on a map. This is what some of us faced as we prepared for an expedition to the region of the Alto de la Palencia of northern Monagas state in 2008 that I introduced in Chapter 3. In one of the SVE meetings leading up to the expedition, a veteran member emphasized the importance of doing our homework, of becoming well acquainted with the survey work that the SVE had previously done in the area we were about to visit. Of the eight SVE members committed to the expedition, four (Maribel Ramos, Luz Rodríguez, Juan Acosta, and myself) had never visited this region. We made a copy of a topographical map of the area produced by Cartografía Nacional (National Cartography) in the 1960s. We found it in the Society's dusty map archives. Carlos Galán, the SVE member going on the

expedition with the most experience exploring this area, used this copy to note the approximate location of limestone formations along the ridge. He also marked with a dot the location of some of the caves already explored.

While in the field, however, establishing a correspondence between the dots on our map and actual caves was a challenge. We had not written down the geographical coordinates of the already explored caverns. Only Rodríguez carried a GPS unit that may have determined whether we stood in front of the gaping mouth of an already explored cavern or not. Yet, even this technology has its limits. As a seismic geologist who routinely does fieldwork all over the country studying fault lines, Rodríguez explained to me that GPS technology is really in fashion, but often useless when hiking within heavy forested areas. "You just can't count on satellite readings," she told me (Rodríguez, Personal Communication, April 29, 2011). Several times we walked by what seemed to be tantalizing entrances in the exposed limestone, and several times those of us who were hiking this area for the first time asked whether these caves had been explored and how large they were. Yet, the general mood by those more experienced members was that *that* was knowledge that a careful study of the published data could provide. The subtext here, at least as I perceived it, was that they were not in the business of serving as guides or slowing down the pace of the expedition. As Carlos Galán emphasized at one point of the trip, "This is a speleological expedition, not a tourist excursion."

The experience of us newer SVE members in the Alto de la Palencia 2008 expedition highlighted how much individuals' capacity to read and recognize the karst landscape depends on previous speleological engagements with this landscape. Moreover, our experience revealed the effort required to translate the speleological

knowledge contained in the Speleological Cadastre of Venezuela into practical knowledge in the field. Society members had acknowledged these limitations before. In SVE meetings during my time in Caracas between 2007 and 2008, the proposal was made of creating a computer database of all caves and their locations by state, and then graphically linking this database to topographical maps of different regions of Venezuela. As Francisco Herrera stressed, this would be for the group's own members, particularly the newer ones who had no previous experience in these karst regions requiring repeat visits. Well acquainted with reading topographical and geological maps and handling and imaging geological data, Rodríguez volunteered to lead this effort. She assigned different Society members with entering into an Excel file template the data needed to plot cave locations. They have first focused on three of the states with the most cave potential beyond the many already explored and surveyed: Zulia, Falcón, and Monagas. Yet, the task has proved more complicated than originally thought. As Rodríguez explained, attempts to plot the location of caves onto maps sometimes "do not match" [caían en sitios disperejos] (Rodríguez, Personal Communication, April 29, 2011). By this she meant that the cave coordinates in the cadastre do not coincide with the cave's *expected* location. She and long-time SVE member Franco Urbani, also a geologist, believe that perhaps there were errors in the data entry, or perhaps the explorers based the calculations on outdated maps.

How could they tell that the coordinates did not match with the actual cave location? Doesn't this require being *in the field*, standing at the cave entrance in question? Recalling Rodríguez's explanation about the limits of GPS technology, how else could cavers establish a correspondence between presumed geological phenomena

based on written reports and the phenomena themselves? She began by describing the case in the field: "Actually, the best way to locate yourself [in the field] is to read a good topographic map together with a good geological map," she explained (Rodríguez, Personal Communication, April 29, 2011). Knowing the location of rivers, particularly where they emerge from or submerge into the ground, is useful information that a topographical map provides. Geological maps, such as those produced by Standard Oil's subsidiary company Creole in Venezuela in the 1950s, note the location and extent of exposed limestone, the soluble rock with the greatest cave potential.¹³ Even when not in the field, as Rodríguez and Urbani tried to "place" caves on a map based on coordinates, they relied on both topographical and geological maps to determine if such numerical location made geological sense. If coordinates placed a cavern far from a limestone outcrop that contains other caverns, they suspected an error. The only way to correct such a mistake would be to return to the field, locate the cave using as many reliable clues (other than the coordinates) as possible, and reenter the correct data. This would be an arduous task, and, as I expressed it to Rodríguez, it puts into question the accuracy of the entire cadastre.

The urgency of this project has grown as more experienced cavers have left the group and new ones have joined. Newer members yearn to make speleological knowledge more accessible and practicable while in the field. Doing so would enable them to make both the karst landscape, *and the cumulative project of over 4 decades of speleological pursuits*, more legible. Such urgency speaks to the concern with continuity

¹³ During his tenure as a geology professor in the Universidad Central de Venezuela, Franco Urbani scanned all of the Creole maps and has made them available to many of the country's geologists.

and growth both of the cadastre and the Society. The idea of what speleological knowledge is *for* is tied to these concerns as well. The belief that such knowledge has use and value beyond the limited confines of speleology might support efforts to popularize both the project and its content. One potential downfall here is that such popularization might lead to cavern's destruction. Another is that it might tip off competing exploration groups of potential new discoveries. This actually is a contentious issue in many speleological communities around the world (I return to this topic in Chapter 7).

I suspect that in the case of the SVE, the idea of popularizing speleological knowledge beyond the confines of speleological scientific practice might be associated with the vulgarization of this practice. Recalling my argument in Chapters 2 and 3, where I describe the group's general embrace of an ethical stance against both geological and personal monumentality, it is probable that the idea of popularizing speleological knowledge could be seen as a form of self-aggrandizement.¹⁴ Let us recall here my contrast among the speleological identities and contributions of Charles Brewer and Eugenio de Bellard. Despite the claim that Brewer and de Bellard popularized their explorations in non-scientific publications, their efforts also have (and in the case of Brewer) continue to reach a broader audience. In contrast, the SVE publications have limited circulation. In Venezuela they are scattered, often missing many volumes, in academic libraries and the personal bookshelves of its members. So used to this internet age, it seemed preposterous to me that this material not be accessible on the web, specially since that kind of accessibility could also raise the Society's profile among other

¹⁴ I suggest this point with trepidation. A closer look at specific moments and events in the group's history counters this evaluation. I return to this point in Chapter 7, where I describe the group's relation with the state.

international speleological groups. The idea had come up before, SVE member Francisco Herrera told me, but it was dropped given the concern that such easy access on the internet of the bulletins' content, particularly the cave maps, could easily be appropriated by some other group that could just copy them and put their name on them. "If somebody really wants to learn about Venezuelan caves, they can come here [to the SVE premises], or visit libraries that contain the *Boletín*" (Herrera, Personal Communication, 2008).¹⁵

One person who has been doing just that is José "Capino" Díaz, a graduate of the geology program of the Central University of Venezuela. Having Franco Urbani as one of his professors encouraged him to pursue speleology. He did so as member of his university's caving club, the CEIC (Centro de Exploraciones e Investigaciones de Campo). During my time in Caracas I witnessed friendly relations between this group and the SVE. Twice they collaborated in technical rope practice sessions, once in a cave in the outskirts of Caracas and another at an abandoned cable car tower on Avila mountain which flanks Caracas to the north (a perfect place to practice rope techniques such as ascents and rappels). Several times CEIC members attended SVE meetings. Sometimes they would bring drafts of their cave maps to get feedback. The group has contributed to the Speleological Cadastre of Venezuela.

Along side his geological and speleological interests, Díaz has created an eco-tourism company. He takes tourists (typically young Venezuelans) on one-day trips to caves nearby Caracas. The Alfredo Jahn Cave, two hours east of Caracas, is a popular destination. In the 1950s, members of the Speleology Section explored this cave of

¹⁵ As of this writing (January 2012), the Society again has a website that does feature the electronic version of some of its most recent publications, but they do not include cadastral entries, much less a search engine of caves. See <http://www.sve-espeleologia.org.ve>.

relatively easy access. The SVE finally published its map in 1973 (SVE 1973).¹⁶ The cavern is not gated, and is within the Avila National Park. Thus it is accessible to anyone. In a 2007 visit to the cavern with friends (two SVE members and their families among them), we found a sign near the entrance that Díaz had produced. It was tastefully made out of wood. It encouraged visitors to keep the area clean, and to respect the cavern by not trashing it, marking graffiti, or destroying its formations. This was not an anonymous gesture. Díaz “signed” the text with his name. No mention of this tourism company is made, however. Regardless, to the SVE member next to me, this was a blatant case of self-promotion. While I did not push the topic further, I suspect he would look down at Díaz or anyone else’s use of speleological knowledge for personal gains. Not everyone would agree. Franco Urbani welcomes Díaz’s use of the Speleological Cadastre of Venezuela to locate potential tour destinations. “This helps keep this information alive. If we don’t use it, we lose it” (Urbani, Personal Communication, October 21, 2011).

Conclusion

Unlike the case of bird watching guidebooks, the purpose of the Speleological Cadastre of Venezuela has been a topic of debate within the SVE’s history. This debate is

¹⁶ Alfredo Jahn is a fun cave. My father took my brothers and I there when we were children several times. The cavern’s inner river makes its exploration a wet affair, but the water is warm, and so are most days of the year in this region of the country. So long as basic precautions are followed, Alfredo Jahn is a wonderful place to introduce children to cave exploration. In the 1980s, my father created a children’s nature camp that included fieldtrips to this cavern. The business venture did not last long, but people’s memories of the experience remain. More recently however, concerns with crime in the area have dissuaded such trips. A family friend had his car and all personal possessions stolen near the entrance of the cavern by gunpoint. For this reason, my father was adamantly opposed to my return visit to Alfredo Jahn with a group of friends (some SVE members among them) in 2007.

implicated in the materiality and organization of the knowledge itself. Different attempts to access this information and read its content point to this fact. As I describe more fully in Chapter 7, debates regarding the purpose of speleological knowledge also take on a territorial hue, particularly when it comes to foreign caving groups visiting the country to carry out explorations. Here my focus has been on attempts to read the cadastre and the maps it contains both within and beyond the caves they describe and represent. Those doing the “reading” are primarily individuals committed to the SVE speleological project, most of us recent (and less experienced) members of the group. As I have described, our “inexperience” represented a number of problems regarding the “use” of speleological knowledge. I mean “use” both in its more abstract (what is this knowledge *for*?) and material (*how* do we take this information and use it in the field?) senses. And again, the cases I consider illustrate the dialectic among speleological knowledge, sociality, and landscape. In the case of the Eduardo Röhl Cave, which I visited with the aim of collecting samples for a climatological study by an SVE member, reading the map involved the epistemological challenge of correspondence. Had I explored the cave represented on paper? Yes, but precisely how I got to that conclusion involved a complex process whereby my twitching muscles, beating heart, strained eyes, and anxious mind *explored* the inner contours of caves. I did not do this alone. Without the kind and accidental companion who joined me that day, I would not have ventured more than a few feet beyond the cavern’s low entrance.¹⁷

¹⁷ I returned to Eduardo Röhl Cave after that first visit. The second time I was with two experienced Australian cavers whom I had met at an international speleological congress in 2005. I was able to arrange for their visit of the non-touristic sector of Guácharo Cave. In return for my favor, they agreed to help me determine the feasibility of sampling stalagmites in Eduardo Röhl. We took photographs of some of the more promising

There are many more ways in which the cadastre, and cave maps more generally, are read. These readings concern less the problem of correspondence and more their qualities as meaningful objects beyond (or alongside) their qualities as objects of science. Recall my concern with taking the original SVE volume containing the Eduardo Röhl cave map to the cave. I noted the risk of trashing the volume, citing the fact that its original run was limited to only a few hundred. When Francisco Herrera helped me collect all 40 volumes of the *Boletín* for my research, he stressed how some numbers were close to extinction and thus jealously guarded and kept in locked storage in the SVE premises. I knew I was being granted a privilege, the privilege to *own* the *complete* material instantiation of over 40 years of speleological practice.

Prior to my fieldwork in Venezuela, I often scoured my father's home library for speleological data. I would borrow his copies of the *Boletín*, but I always did so with care, making sure I returned them to their proper place. During my time in Venezuela, when I went to people's homes to interview them, they would treat their volumes with care, and sometimes speak of them with pride, even tenderness. Throughout the years, these irreplaceable volumes have become embodiments of memories of past expeditions with friends, of extraordinary and varied cave landscapes explored. They have become objects of love. I believe this quality does not apply to any one volume in particular, but

formations, although they argued that none seemed ideal for the research purpose as they understood it. I passed along the photographs to Carrillo, but the issue was never followed up. I was relieved. Soon after our initial meeting, it began to dawn on me what I had just so casually volunteered for. I was to visit a cavern near Guácharo Cave and retrieve cave formations. All of the sudden, the image of me walking through town with caver overalls and three broken stalagmites for a science project hit me as ludicrous, even dangerous in terms of what local Caripenses might think the true motives of my project were.

to all of them *together*, stacked side by side. In this way, they emphasize the collective enterprise of *la Sociedad*, a collective enterprise with a history that to some spans most of their lives. This was most evident to me when Francisco Herrera pointed to his complete volumes in his personal library and said, “When I see them... I cannot let this end” (Herrera, Personal Communication, 2008). In this “reading” of the cadastre, their very materiality, spanning over 40 volumes, embodies not just their past, but also, the possibility of their future.

I turn to one last example of an alternative reading of cave maps. In Chapter 2 I already introduce Beatriz, Eugenio de Bellard’s daughter. During our many conversations together in Caripe, she spoke passionately about her father, highlighting his many achievements not just in speleology but other sciences, law, and public service. In part her decision to move to Caripe was about carrying on her father’s dream: making Guácharo Cave a UNESCO site.

A daughter wildly enamored with her father had just met yet another. Our paths crossed, each of us in our own way retracing the paths of our fathers, two men, who in turn, had known each other through my godfather, Juan Antonio Tronchoni. Tronchoni and de Bellard had been best friends for many years. They had, together, fed their passion for caves, and had, eventually, parted ways. Always with Beatriz I was cautious with my words, cautious about extolling my “speleological allegiances” which, in her view, rivaled and even denigrated her father. I attempted objectivity as I asked countless questions, obsessively attempting to reconstruct her father’s relation to caves, this Guácharo Cave where so many stories have coalesced.

But stories coalesce and gain meanings not just in space, but in and with its representations. In April of 2007, on one of my visits to Caripe, I took de Bellard's old friend, Ramón Hernández, with me. One evening in Beatriz's home, I pulled out a copy of the Guácharo Cave map that the Venezuelan Speleological Society had published in its 40th anniversary commemorative issue (Fig. 2.8). This map was a plan view of the cave, including both of its touristic and non-touristic sectors. The image based on a computerized vector file version of the original maps published in 1968 and 1971 (SVE 1968, 1971). I placed on Beatriz's table after dinner, eager to prompt stories of exploration and to *place them* in the space represented on paper.

With pencil in hand, Hernández sketched in by memory the two galleries that he knew existed but were not graphically depicted. These were the *Salón Agustín Codazzi* and the *Galería Negra* that members of the Speleology Section discovered and explored in 1961. Hernández had been part of their first exploration. Hernández's edit did not dispute the accuracy of the map, however. In fact, he recalled being part of the discussions that led to wanting to block the entrance of these two rooms because they were considered extremely delicate, beautiful, and even dangerous.

Beatriz brought out a box of old photographs, as well as some of her father's survey notebooks. She carefully unfolded a working draft of her father's Guácharo Cave map. Like the SVE graphic, it projected the top-down, or plan view, of the cave. Beyond what appeared to be the cave's Humboldt Gallery, the main passage coiled like a nautilus, a shape and orientation radically different from the one represented in the SVE map. "It is a perfect shape! I do not know which map to trust," Beatriz exclaimed.

Checking which map was more accurate would not have been very difficult. Although she had been in the non-touristic sector of the cave many times, however, she had no cave surveying skills. In fact, all that would have been necessary to dispel the authority of any one representation was a compass. Admittedly, despite having gained some basic cave surveying skills myself, I did not put them to use at Guácharo Cave. I *trusted* the SVE map as the most accurate representation. Our conversation that evening, however, was less about the veracity of the representations before us than of the competing allegiances we each had invested in each of these images: my father, my godfather, their *Sociedad*... versus her father, his speleological ambitions of finishing what Humboldt had started, stunted, scooped.¹⁸ Interestingly, Hernández, despite having been a close friend of de Bellard until his death in 2000, sided with this SVE effort, which included his own labor, properly credited in the pages of the *Boletín de la Sociedad Venezolana de Espeleología*. But there is more. To focus here on these maps as representations alone misses each of our emotional investments in these objects and ignores their power in our own constructed relatedness to that space that they—accurately or not—claim to represent. Particularly for Beatriz, to hold, unfold, and carefully trace her finger on that working draft was the closest she had to touching her father's muddied and sweaty hands as he steadied himself in the irregular cave passage and attempted, as best he knew how, to survey that space he adored. A map, yes, but also a relic, a heirloom, an object of love.

¹⁸ When one survey party picks up the cave exploration of a cavern that had already been started by another party, without this first group's knowledge or consent, this group has been "scooped."

Hernández also had been an enthusiastic cave photographer. With other members of the Speleology Section, such as Danny Adler and Carlos Tinoco, Hernández experimented with different bulbs to produce powerful enough flashes to light dark passages. Carefully picking up cues from cave pictures of speleological publications from Europe and the United States, they creatively played with the position of their flashes to create intriguing contrasts of light and dark so as to capture the cavernous shapes, volumes, and depths. Hernández did not limit himself to these carefully composed images. He was an avid photo-journalist, both within and beyond caves. He kept well organized photo albums and slide boxes in his small room in a Caracas catholic school that had been his home for over years. One of his favorite photographic tools was a stereoscopic camera that produced three-dimensional pictures. With it he took a picture of Eugenio de Bellard with his daughter Beatriz in Guácharo Cave in 1984 (Fig. 5.1). Beatriz could barely contain her excitement when she saw this picture through Hernández's stereoscope. "Oh, my God!" she gasped, "This is the only picture of me with my father where he is hugging me!" In the photograph, Beatriz, a smiling high-schooler, stood next to her father, his arm wrapping her shoulders. This image does not exhibit any play with shadow to highlight the cave. Rather, the flash was fired directly at its human subjects, the surrounding cave formations draping around them, glittering.

Chapter 6

Encounters with/in the Cave Frontier: Speleology as Boundary Practice

To the Chaima who have made the mountains of the greater Caripe region their home, the area's rugged terrain and relative inaccessibility have been a haven. In these mountains their ancestors found refuge from the violent incursions of Spanish conquistadors, Catholic missionaries, and landowners seeking potential Christian converts and cheap labor (de Civrieux 1998:40-73). However, this relocation denied them access to their culture's most sacred site, Guácharo Cave. Fortunately, the spirits of nature are generous: these mountains are peppered with caverns, all of them housing sizeable guácharo colonies. In their quest to locate these caves and hunt their prized nocturnal dweller, many Chaima have become expert trekkers and explorers themselves (Galán 1981, 1991).

This same region also has been a key stage where the Venezuelan Speleological Society has enacted a particular ethic of exploration. This ethic challenges persistent threats to its identity as a scientific, volunteer-based, and non-profit organization.¹ I have already pointed to the group's rejection of geological and personal monumentality. It has done so with its promotion of a collective project whereby caves, all caves, gain value as part of a national registry. Here I examine the group's efforts to challenge two stereotypes. The first is that of wealthy urbanites engaged in ecotourism, seeking some

¹ These "threats" are not so much external to the group as they are part of the group's own constant need to define its identity and guard its boundaries to *itself*.

brand of adventure in “pristine” nature (Vivanco and Gordon 2006). The second regards the trope of the imperial white/European/Europeanized naturalist who exploits local labor and knowledge in quest for knowledge or resources. The Society’s relationships with the greater Caripe cave landscape and its indigenous inhabitants offers a glimpse of how the group has coped with these stereotypes. The dynamics, both real and imagined, of these relationships are the focus of this chapter.

These stereotypes stem, in part, from speleology’s dual quality as a “sporting-science” that I introduce in Chapter 1. E. A. Martel, who popularized speleology in Europe and beyond in the late 1800s, hoped that its adventurous quality would lure mountaineers by presenting the underground world as a pristine environment awaiting discovery (Chabert and Watson 1981; Shaw 1979). But Martel, who had not formally trained as a scientist, also aimed to appeal to the established scientific community. Although member of the Paris Geographical Society, his efforts to secure speleology’s place within French geological research did not succeed (Schut 2006). His 1895 presentation in the Sixth International Geographical Congress also went largely unnoticed (Cant 2006:775-776). Even today, speleology remains a marginal science, rarely featured as an established sub-discipline couched within geology departments in universities worldwide.

In contrast, Martel’s speleology caught on spectacularly among outdoor enthusiasts. Among them were academic scientists as well, mostly from fields such as geology, biology, and archaeology. Martel’s dedication to speleological societies and journals provided an organizational template that many, including the Venezuelan Speleological Society, aimed to follow. More importantly, his many publications about

his expeditions, speleological knowledge, and technique promoted a common purpose and language (Shaw 1979:385). Key here was the belief (and commitment) that *anyone* could do science. The cave landscape made this possible.

In this chapter I examine this sporting-science duality as it plays out at different points of the SVE's history. To Sarah Cant, speleology's dual character contributed to the breakup of the British Speleological Association in the 1930s since it pointed to irreconcilable differences between the scientists and non-scientists (2006). In contrast to her case, however, I offer descriptive accounts of how this presumed duality plays out in the field. I suggest that in practice, speleology's sporting-science quality has the capacity to unite as much as to divide. Again, it is critical to appreciate the dialectic between sociality and landscape prior to assuming the ubiquity and effects of this (or any other dichotomy). With caves, I suggest, we are dealing with a particular kind of landscape whose exploration, mapping, and study involves a group effort whose success is premised on a variety of skills and expertise. The previous chapters have emphasized these qualities of practice. I again turn to them here, this time moving beyond the cave itself to include the broader karst landscape. In Chapter 3 I argued we think about the cave map and registry as boundary objects. Here I consider thinking about the cave landscape as a boundary space whose exploration has the potential to bring diverse actors together in a common task, a common experience. This examination also aims to temper the "scientific" bias in my own analysis by attending more to the "sporting" side of human engagements with/in the landscape. A focus on mountaineering offers a contrast to the caving case.

Also in contrast to Cant's case, my exploration involves a drastically different historical and cultural context of practice. Part of this "context" is the other key source of the stereotypes members of the Society aim to dispel. Both for the Venezuelan speleologists and the social scientist studying their practice, the trope of the imperial explorer is impossible to dismiss. In this chapter I examine some ways in which cavers have attempted to dispel and subvert the imperial eurocentrism of speleology. I focus on the SVE's engagement with a specific karst region, that of the greater Caripe Valley, and its inhabitants, several of them of Chaima descent. This "engagement" takes three forms: First, it includes the specific relationships that SVE members have established with particular inhabitants of these mountains throughout the years. These relationships include field practices (hiking, setting up camp, sharing food), but also how the cavers have chosen to address them in their speleological publications and in recent interviews. Thus, caver published representations and stated interpretations of these relationships are the second form that my evidence takes in my argument. Third, I analyze specific events that transpired during two expeditions to the Monagas karst, one in 2002 and the other in 2008.

Scholarly attention to "cultural encounters" frames this discussion. In particular, I contrast the SVE-baquiano relations to other encounters in the field: Venezuelan elites and indigenous and mestizo workers in a famed 1951 expedition to the Orinoco River headwaters (Reig 2006/2007) and international mountaineers and their Sherpa porters in the Nepalese Himalayas (Ortner 1999).

There is a glaring deficit in this chapter, and that is the voice of these individual Chaima men. In the case of the specific relationships I address in the first part of the

chapter, by 2008 the Chaima men it features had already died or moved from the region. My plan for a more rigorous ethnography in existing Chaima mountain communities, a necessary preamble to conversations with Chaima *baquianos*, remains pending.² I acknowledge the limits and pretensions to capture “the voice of the subaltern” (Spivak 1988). Still, there is no excuse for not trying. I thus cautiously embrace the risk of perpetuating and even romanticizing the views of predominantly white urbanite males as they encounter “the Other” in Venezuela’s “nature.”

In the case of speleological practice, forging speleological identities also is a deeply embodied process. Actors are intensely and constantly aware of their physical capabilities, dispositions, and skills in relation to the broader cave, or karst, landscape. They depend on these capabilities, dispositions, and skills as they make their way to, into, and then back out of the caves they explore and survey. In the context of the SVE’s collective enterprise, this process also is performative—not to an audience as in the case of spectator sports—but to other members of a team upon which the speleological enterprise depends (Dyck and Archetti 2003). As in the previous chapters, the current analyses strive to keep in the forefront the particular dynamics of human engagements with the landscape. Scientific practice in the field results in particular forms of sociality that, in turn, shape science, the landscape, and the individual and collective subjectivities.

² The term *baquiano* refers to a local guide whose knowledge of the landscape and its ecology derives from his lifestyle’s deep involvement in his environment. During my research I heard the term used in two particular settings. The first was among SVE members referring to these men whose knowledge they depend on to find the cave entrances (I never heard of a female *baquiana*). In this case there is always a sense of respect for local knowledge, testament to a living Chaima tradition. The second was among Guácharo Cave guides to whom *baquiano* typically referred to a less educated and untrained guide, often providing tourists with misinformation. I examine the case of Guácharo Cave guides in Pérez and Galindo 2009.

Exploring the Karst of Northern Monagas: From Contact to Engagement

The knowledge of expert mountain trekkers of Chaima descent has been fundamental to the success of SVE explorations to the caves of northern Monagas state since the late 1960s. Not only have these baquianos guided speleologists to the caves located within this very thickly forested mountain region, they also have carried equipment, built shelters, and even provided a warm meal late in the night as the explorers emerged from hours of work in a cavern. In SVE lore, the relationships established with these men intermingle with the experience and significance of the landscape. In a 1991 article on the karst of northern Monagas, SVE member Carlos Galán writes:

The area of Mata de Mango ... holds for us much more than a simple listing of cold facts about a group of caves. It is a formidable region and, to speak of it would require much more space. Regardless, we would like to make at least some reference to the "environment" in which explorations have taken place and the impressions [of the region] made upon its explorers. [Galán 1991:1]

German naturalist Anton Göering, who traveled extensively through Venezuela between 1867 and 1874, carried out the first documented visit of the caves of this region (Briceño Monzón 2005; Galán 1991). The trip took him seven days from the town of Caripe, by mule and by foot. Chaimas were his guides. Göering did not explore inside caves but produced watercolors of their entrances. Members of the Speleology Section of the Venezuelan Society of Natural Sciences visited the area in the early 1960s. Member Julio Lescarboursa was the first to reach the region of Los Gonzales and lead the first exploration of the cave by that name, but lack of proper equipment to access its vertical pits impeded much progress (SVE 1982).

This "environment" is also unknown, at least to most: "Mata de Mango or Caves Ridge are names that do not figure in on maps," Galán notes (1991:1). The ruggedness of the region forms tight valleys with abrupt changes in altitude within only a few hundred meters. There is limited geological information on the area, most of its topography estimated by photographic overview from the air. The extraordinary density of vegetation makes accurate geological readings difficult even *on the ground*.³ It is by exploring and surveying caves and reading them as internal geological blueprints that the SVE has constructed an overall "picture" of the region that includes both surface and subsurface features (not just caves but also their hydrological affinities to the many rivers that traverse the landscape). Finally, Galán characterizes this "environment" as one having demanding caves to explore. Not only do most require 3 days of strenuous hiking to get to them, "most caves are important *simas* or vertical pits with active sumps of epigean rivers" (1991:1). Almost constant rain ensures large water volumes of internal cave rivers, their levels increasing with little warning and making their exploration treacherous. Even when entry into a cave is possible, the chances of having to wade or even swim good stretches are high. Becoming involved in technical rope techniques, such as those that rock climbers use, to descend and ascend cave pits, often gushing with their internal rivers, is the norm in Mata de Mango. This translates into heavy cargo to and from caves, particularly when the ropes are wet. On the return hikes, they always are.

But as Galán notes, there is much more to this "formidable" region than challenging speleological research (1991:1). Galán expresses deep gratitude to Domingo Maita, José Zapata, Pascual Roque, Felix Morocoima, among others, men of Chaima

³ See Chapter 5.

descent who guided SVE expeditions to these caves. Navigation within the jungle alone would have been extremely difficult without the knowledge and skills of these expert guides who had traveled the mountains during hunting missions, many leading caves in search of oilbirds. As Galán claims, and other SVE members familiar with this region underscore, the relationships with Chaima baquianos have involved mutual respect born out of the dedicated effort and shared joy of exploration and discovery. This

shared passion for the underground landscape and the challenges involved in traversing them have united *baquianos* and speleologists in fraternal camaraderie ... the achievements of one group could not be understood without the cooperation of the other. For this reason, we do not want to end these lines without expressing our most sincere recognition of the labor of these men who have accompanied SVE members during all of their expeditions to this region. [Galán 1991:2]

Cultural Encounters, Revisited

There are many reasons to be suspicious of these claims. The more common arrangement of these kinds of encounters involves dramatic power differentials between the “Explorer” and the so-called native, where the first exploits the second for his labor, knowledge, and resources. At the end of the affair, it is the “Explorer” who writes history, erasing the contribution of those without whom the whole enterprise would have been a total failure (Pratt 1992; Short 2009). This is the case of the French-Venezuelan Headwaters Expedition of 1951. As Venezuelan anthropologist Alejandro Reig notes, the purported main goal of this 1951 excursion was to locate the origins and survey the course of the Orinoco River (2006/2007). The entire enterprise depended on the labor and knowledge of 50 indigenous and mestizo workers whose critical participation was silenced in official accounts. According to the personal accounts of 15 of these surviving

men, their work, which involved carrying all of the food and equipment, clearing the vegetation for the party, tolerating verbal and physical abuse, was never properly remunerated (Reig 2006/2007:58, 61).

In some ways an SVE expedition to Mata de Mango resembles the Headwaters Expedition. Both cases feature predominantly white creole men, many of very recent European descent (if not actually European by birth), traveling to rural Venezuela to explore and survey “nature,” counting on the labor and knowledge of indigenous guides. Indeed, Reig’s analysis focuses attention on “the relation between the native peoples of Amazonas and the ruling elite of Venezuelans, traditionally coming from the center of the country, which has defined its political administration and the destiny of the territory and its inhabitants” (2006/2007:63). Venezuelan speleology echoes this arrangement. Despite the social and economic diversity of its members that I have emphasized in previous chapters, the SVE can be considered an elite organization. By elite I do not mean that these members have been part of an exclusive and wealthy social class, as was the case for the Speleology Section of the Venezuelan Society of Natural Sciences. The SVE founders wholeheartedly rejected participation and recognition based on that kind of exclusivity. I consider the SVE an elite organization based on the fact that over half of its membership has been university-educated, and of that group, several received higher degrees either in Europe or the United States. As I have described, these academics participated in explorations along side construction workers, mechanics and engineers, insurance agents, bankers, and even the occasional social misfit, but the core of the group’s identity was forged and has been sustained primarily by members of a small educational and cultural elite. Moreover, virtually all of them are from Caracas, the

country's capital, also the place where the group has its home and coordinates its activities.

I also have suggested that speleological practice, which takes place in a very peculiar kind of landscape, engenders a distinct kind of sociality that echoes the group's commitment to a collective and non-hierarchical brand of civic science. I propose something similar is at play when it comes to the kinds of relations that SVE members have forged with a number of indigenous baquianos of northern Monagas. Attention to the specific practices that go on in the field open up a number of interpretative alternatives to speleological encounters between white, predominantly European(ized) elites and a presumed "Other." On this count I build on recent (and not so recent) work that reexamines and even questions the "cultural encounter" trope that has received so much critical attention.

The study of cultural change has been one of the key concerns of anthropological research. In efforts that gained strength in the 1970s and 1980s, scholars sought to move away from two problematic assumptions (Coronil 1996; Ortner 1984; Sahlins 1985). The first regarded linear paradigms that assumed unidirectional forces of cultural change (Coronil 1995; Mintz 1985; Ortiz 2001[1940]). The second involved the treatment of indigenous communities as isolated and somehow frozen in history (Ortner 1984; Sahlins 1985; Wolf 1982). A more historically grounded and critically motivated anthropology sought to address the colonial and postcolonial condition that went beyond the formal workings of empire (Stoler 1991). A number of scholars turned a renewed focus on the dynamics of contact, of cultural encounter, as a way to escape the structural determinisms of large-scale frameworks such as dependency theory (Scaramelli and Tarble 2005:136-

138). This trend “emphasizes the intertwining and mutual production of the histories of the West and the Rest” (Ortner 1999:17). Such efforts have included, for example, interest in the role of material culture to the focus of the body as a contested site where sentiments, politics, and power, come together (e.g., Appadurai 1986; Mintz 1985; Mueggler 2005a; Ortner 1984; Scaramelli 1986 and Tarble 2005:138; Stoler 1991). Some have looked more closely at the terms of the relationships forged during encounters to suggest more nuanced dynamics that question, at least to a point, the paradigm of the oppressor and the oppressed. Even in the case of the 1951 Headwaters Expedition, Reig highlights the role of the indigenous and mestizo workers’ own performance in the structuring of “symbolic and material – territorial – orders” that the Expedition brought about (2006/2007:66). For my present analysis, I draw particular attention to three works that investigate the embodied and emplaced qualities of culture contact.

In his book *Out of our Minds: Reason and Madness in the Exploration of Central Africa* (2000), anthropologist Johannes Fabian reviews a broad selection of travelogues written by Europeans who traveled to central Africa between 1885 and 1910. In these narratives, he reveals a pattern in the descriptions of encounters between Europeans and natives that challenge the myth of the heroics of exploration: “European travelers seldom met their hosts in a state we would expect of scientific explorers: clear-minded and self-controlled. More often than not, they were ‘out of their minds’ with extreme fatigue, fear, delusions of grandeur, and feelings ranging from anger to contempt” (2000:3). The “ecstatic condition” includes not only “the effects of alcohol, drugs, illness, sex, brutality, and terror,” but also “the role of conviviality, friendship, play, and performance” (2000:9). In other words, Fabian highlights what has been edited out of official imperial

story: that the conditions that have produced encounters with and knowledge of the Other have been anything but rational and disciplined. Indeed, without the “ecstatic,” potential “participants” of these encounters may have never been able to “transcend their psychological and social boundaries” (2000:8-9). I suggest thinking of the role of place in differently positioned actors’ capacity to achieve such transcendence. More specifically, could there be something about the experience of/in place that leads to the ecstatic that Fabian considers a key precondition for knowledge in events of encounter?

I also rely on anthropologist Sherry Ortner’s study of Himalayan mountaineering culture as a productive counterpoint to my examination of speleologist-baquiano relations in the Venezuelan karst (1999). Her approach also focuses on the history of encounter between two groups that have confronted, in different ways and with different degrees of success, the inherent asymmetries of power in their relations: the international mountaineers and the indigenous Sherpas who sold their labor as porters (Ortner 1999:17). Their encounter is considered within the broader context of capitalist expansion, including the rise of adventure tourism and travel that radically transformed the Nepalese social and material landscape. Ortner’s story emphasizes the Sherpa community’s own transformations, both on and off the mountains, in relation to these changes. I draw from her careful attention to expedition dynamics, both in terms of material practices and ideologies, to contrast and contextualize Venezuelan speleological practice. While my analysis does not benefit from in-depth ethnography and interviews on the Chaima side of the relation, it does provide the ethnographic insight that only participant-observation can provide in the development of these expeditions on the ground.

SVE-Baquiano Relations Remembered

From the 7th to the 11th of November 1977, a small SVE team attempted yet again to complete the exploration and survey of the demanding Bastimento 1 Cave. High waters inside the predominantly vertical cave had kept others from reaching its purported end in the past. My father, Wilmer Pérez, along with Juan Enrech and Carlos Bosque, made up the 1977 SVE team. They were led to the cave by Chaima baquiano José Zapata. Pérez's field notes describe high waters yet again, despite it being the dry season. He knew that the complete exploration and survey of Bastimento 1 would require doses of physical strength, skill, and determination that were quickly becoming standard practice in the Mata de Mango karst. Bastimento 1 turned out to have numerous challenging vertical steps, ranging from 3 to 11 meters in height. Climbing ropes were required. At the first challenging vertical pit, Bosque decided to stay behind. Pérez and Enrech continued the cave survey as they struggled with its many inner waterfalls. This meant putting away survey equipment in their waterproof backpacks and connecting their climbing harness to the rope they secured before each drop. Care had to be taken to make sure that the stone did not cut into the rope.

At one of these drops, Enrech dislocated his shoulder. Pérez recalls frustration setting in. Without a partner he could not continue surveying. Fortunately, Zapata had followed them in this far. Pérez asked him if he was willing to help finish the job. A five-minute short crash course on rope techniques and surveying followed an enthusiastic "yes." Zapata picked up the instruction quickly and without hesitation. They successfully made it to the end of the cavern whose map was soon thereafter published in the Society's *Boletín*. The cavern totaled 510 meters (projected onto a horizontal plane), with

170 meters between its highest and lowest point. It “ends” in a deep pool with no apparent current but whose depth could not be ascertained.⁴ Zapata is listed as one of the surveyors in the cavern’s cadastral entry (SVE 1977:225-226).

In his field notes Pérez describes Zapata as an "excellent companion" who would "not say 'no' to anything." In Venezuelan slang, Zapata "le echa bolas," or gives it his all. This is a disposition that a number of SVE explorers, particularly those that participated in the physically challenging Mata Mango expeditions, repeatedly evoke with admiration, a quality tacitly expected of their team mates, whether baquiano or not. To Pérez, the baquianos such as Zapata who accompanied them in these expeditions were “adventurers” who “enjoyed exploration.” He recalls Zapata’s extraordinary willingness to throw himself into the dark pool deep in Bastimento 1, eager to carry on the exploration. “He was very enthusiastic like all of us [SVE members] during that time.”

Prior to an expedition to Mata de Mango, the SVE would send a telegram to Domingo Maita, a respected Chaima elder who lived in Yucucual, a small mountain community near the town of Caripe. The group first established its relationship with Maita in the late 1960s. From then on, this relationship grew and intensified, particularly with those SVE members who made repeated visits to Mata de Mango. One of them, Carlos Galán stands out for his exceptional dedication both to the speleology of Mata de Mango and the indigenous men who made it possible. I want to highlight Galán because of the ways he so powerfully embodies and transcends speleology’s dual character as a sporting-science. Even more intriguing are his explorations of other domains beyond the

⁴ Again an example of the open-ended character of cave exploration and surveying. Could the cave go further? With scuba gear it is probable that further passages might be reached.

scientific that speleological encounters in Mata de Mango have made possible. In these encounters, Galán enacts Fabian's ectasis (2000). We do not have the story of the indigenous counterparts in these experiences, but the length and apparent intensity of their relationship (almost spanning 3 decades) suggests some kind of retribution, some kind of coevalness that cannot be ignored even its precise nature cannot be analyzed and confirmed. I work with the available clues. Among them, is the particular landscape where these encounters occurred and relations were forged. In fact, we ought to consider this landscape and Galán's own speleological sensibilities, both ideological and physical, together as mutually constituting. Surely, Monagas's mountains and caves would be there regardless of Galán's existence, but their knowledge and representation as part of a greater karst landscape would have been different had it not been for Galán's particular engagement commitment to representation. Even more important has been the special relations he has forged throughout the years with the expert Chaima baquianos who inhabit this region. Again, he was not the only one to gain the esteem of these men and vice versa. Yet, it was Galán's vision of and commitment to a different science, an alternate speleology, with a more inclusive and non-exploitative model of knowledge that made a critical difference. The karst of Monagas, its people, and Galán's life-long efforts in the context *la Sociedad*, illustrate how "[m]aking nature, making places, and making persons are ineluctably social and incorrigibly intertwined processes" (Mueggler 2005a:722).

Carlos Galán

To my father, Galán “was the Society's first true, and perhaps only, speleologist.”⁵

Together they participated in many expeditions to the greater Caripe region. They shared qualities that made them perfect expedition partners: exceptional physical endurance and swiftness, survey and rope skills, an intensity focused on getting to the end of the cave and getting the job done. Unlike Galán, however, my father practiced speleology as a pastime, a means to get out into the mountains. His main career was in medicine. Aside from a couple of research projects on histoplasmosis and the physiological effects of long-term cave isolation in the late 1960s, he did not pursue cave science beyond the goal of producing cave surveys. In contrast, since high school, Galán has been focused on speleological pursuits, and of all past and current SVE members, is the only one employed as a speleological researcher (in the Society of Sciences Aranzadi, in San Sebastián, Spain).

Galán was born in San Sebastián, Spain, in 1949. As a boy he moved to Caracas when his mother divorced his father and married a Venezuelan. As a high school student he was part of the Sociedad de Ciencias La Salle, where he met Omar Linares and my father. All three speak highly of these years, of the opportunities that this Society offered, particularly in gaining field science techniques during group excursions. Galán followed Linares and my father in contacting the Speleological Section of the Sociedad Venezolana de Ciencias Naturales, an episode that he recalls with surprise, since “they

⁵ Indeed, of all SVE members, both past and present, Galán is the only one to be hired within a scientific institute that recognizes speleology as one of its specialties. Beyond, this, however, I believe that this characterization reveals my father’s bias towards the exploratory (read “sporting quality”) of speleology. While other SVE members have matched Galán’s dedication to the *science* of speleology, no one has done so while at the same time pushing the boundaries of speleology as a sporting pursuit. Galán has done both, simultaneously, because, as Galán himself has stressed, each relies on the other.

were received with open arms" (Galán, Interview, March 7, 2008). Upon graduating from high school, Galán returned to Spain to study biology at the university. He grew interested in cave animals, and began collecting specimens that he would take to researchers focused on biospeleology in both the Society of Sciences Aranzadi and at the Laboratoire Souterrain de Moulis (part of the National Center of Scientific Research). He always was encouraged to pursue his speleological interests. But along science he grew increasingly enthusiastic about overcoming the physical and technical challenges of vertical caving. He joined international expeditions that explored the deepest vertical pits in the region. Interest in rock and mountain climbing followed. In 1970 he was invited to an expedition in Argentina. There he ended up staying for 7 years, and even helped form the Centro Argentino de Espeleología.

Galán describes his time in Argentina, which coincided with the country's "Dirty War," as a sad period. In 1976 he managed to exit the country and return to Venezuela, a change that he recalls as extremely positive, since he was able to reunite with old friends. The Venezuelan Speleological Society became a home. In 1997 he moved back to San Sebastián, where he formally joined the research staff of the Society of Sciences Aranzadi. Even while living abroad, his commitment to Venezuelan speleology remained strong, traveling to Venezuela at least once a year, joining SVE expeditions, writing up biospeleological research papers, and producing cave maps to add to the National Speleological Cadastre (Galán, Interview, March 7, 2008).

Upon his return to Venezuela from Argentina Galán made Sucre state, just north of Monagas, his home. The Society's correspondence archives contain many of Galán's letters to the group, most of them addressed to geologist and long-time SVE member

Franco Urbani, reporting on his very frequent trips to the karst within the Turimiquire Range and neighboring regions. The letters are either handwritten with neat and small handwriting, or typed, all of them barely leaving any blank space or margin. Their content is extremely descriptive, focused on the exploratory and scientific potential of the area in question, often eager to discuss potential hypotheses of karst formation. Their frequency, formality, and speleological rigor befit a man so intensely focused, both intellectually and physically, to speleological practice and all that entails: exploration, science, surveying, and critically, writing.

During his many visits to Mata de Mango, Galán befriended Domingo Maita. To my father and other SVE members who often traveled to the northern Monagas karst, Maita esteemed Galán as a son (Maita also was 30 years Galán's senior). While Galán does not use kin terms to describe his relationship with Maita, he does provide details that suggest an exceptional degree of affinity between the two men. In a 2011 interview, he described Maita as a shaman with beliefs in spirits who kept Chaima traditions alive. "Too bad I did not record him," Galán noted, "but perhaps if I had he wouldn't have talked" (Galán, Personal Communication, August 5, 2011). Several times he saw him go to the entrance of a cave to ask the guardians (the spirits of nature) to take care of us (before starting the exploration). Several times Galán arrived to a cave that had small offerings at its mouth. Pérez confirmed this.

As I note in Chapter 2, anthropologist Marc de Civrieux describes the form that some of these offerings took for the Chaima when they were about to enter a cave (de Civrieux 1998:125). These descriptions, however, are based on oral accounts. This is a point that Galán stressed. While conceding the value of de Civrieux's work, Galán was

emphatic that the kinds of insights he and other fellow SVE members gained of the living indigenous conception of the landscape and its spirits is based on a radically different relationship. This relationship is premised on going on expeditions together. Along expeditions, SVE members appreciated knowledge and practices that went beyond the ritualistic and utilitarian aspects of Chaima-cave relations associated with guácharo bird capture described in Chapter 2. In the 2001 obituary of Domingo Maita that Galán authored and published in the SVE's *Boletín*, he describes him as an "speleologist in the sense that he had explored many caverns, had descended imposing pits with ladders made of reeds, and had climbed subterranean walls and vaults to reach the nests from which young oilbirds would be captured" (2001:70). By describing him as a *speleologist*, Galán broadens (and perhaps even challenges?) the kinds of knowledge and practices associated with science. Maita, along with the other men who repeatedly joined the SVE Mata de Mango expeditions, could describe, often with perplexing accuracy, the dimensions and connections of underground systems. They described their findings orally, using "brazadas" (arm's length) as unit of measurement. This knowledge resulted from entering caves *well beyond* what is necessary to capture oilbirds. On this point, Galán, Pérez, and other SVE members that joined them in these expeditions are emphatic.

SVE explorers often arrived to the entrance of a cave, many of them considerable pits, that had already been rigged with wooden ladders and "bejuco" or reed ropes that baquianos had crafted to aid in their bird hunting and exploration (I witnessed this in the 2008 expedition described below). In 1981 Galán authored the most thorough description of the tools and methods associated with these indigenous exploratory techniques published anywhere (Galán 1981).

Guácharo hunting involves teamwork among hunters (with parties ranging from 4 to 20 men) with the skills to build and use the necessary tools to access the caves and collect the live guácharo chicks from their nests. As Galán notes, moreover, guácharo hunters are careful not to decimate the guácharo population of any one cavern, so they rotate among the many caves of the Mata de Mango region. This emphasizes the exploratory aspect of the practice, which goes beyond trekking back and forth to habitual hunting grounds. Before a hunting trip every season (usually between April and May after guácharo chicks are born), several reconnaissance journeys are made to determine exactly which caverns provide the best hunting options. This is done by exploring the cavern's mouth, whether this means climbing down a pit or climbing up to the ceiling of a cavern, to determine the location of the nests. This exploration is done with tools that the hunters produce with their hands and machetes and materials they gather around the cave. Their production takes place in a group, usually under the direction of a more experienced hunter who, because of his age, might not actually participate in the hunting. Wood logs of different lengths and widths are used as "ropes" to pull oneself up to reach higher ledges. For less accessible ledges, the hunters build ladders that they lean on the cavern's walls. Other times a single sturdy pole is used with attached stepping logs (Fig. 6.1a, b, and c). To descend vertical pits, flexible ladders are made with *bejuco* (lianas, woody vines) and fixed at the pits' entrance. During the actual hunts, captured chicks are tied to a belt secured out the hunter's waist. An entire hunting trip might last up to a week. Several hundred chicks might be fetched at one time (Galán 1981:28-35).

Galán's research help dispel the stereotype that indigenous practices associated with caves are limited to functional uses of the resources.^{6,7} They involve "an adventurous spirit" (Galán 1981:31). Others have made this claim. Based on his ethnographic work among the Shuar Indians of Ecuadorian Amazon, Steven Rubenstein challenges the assertion that such experience belongs to the domain of modern Western culture (2006:236) Moreover, in the context of ongoing indigenous politics, not just in Caripe but in Venezuela and Latin America more generally, his publication helps challenge the idea of the Chaima culture "as dead."

Baquianos as Hired Laborers in Comparative Perspective

To Pérez,

Those guys [the baquianos] were proud to share with us ... we did not pay them much ... we established a unique relationship, they enjoyed exploration, but their methods were limited and in a way we [with our climbing techniques] made it possible for them to explore further. There was no difference among us. They were our companions. [Pérez, Personal Communication, August 8, 2011]

In fact, baquianos (including Maita) were routinely paid a daily amount. I have no data to compare this payment to these men's other sources of income. It appears that baquianos were not routine hired day laborers.⁸ Thus, there was no straight-forward way of calculating the compensation for a day's loss of wage. In any event, SVE expeditions to

⁶ See Watson 1974 for an early and classic commentary on this theme.

⁷ Galán emphasizes that baquiano incursions into caves show no negative impact on the cave itself. This contrasts markedly with caves closer to the town of Caripe and whose location are common knowledge, most of which have been trashed and vandalized (they lack protective gates) (Galán 1981:30).

⁸ In a conversation with Francisco Brito, one of three baquianos who lead the 2002 SVE expedition to Mata de Mango, he noted that he "worked the land." However, I do not have details regarding precisely what this meant, if he worked his own land or somebody else's for a daily wage. This is a topic that begs further research.

Mata de Mango typically took place during Holly Week, which was the longest national holiday during which most Venezuelans did not work. Moreover, the baquianos of Mata de Mango do not, beyond the SVE explorers, lead tourists on mountain treks. This contrasts to the indigenous guides of Canaima National Park, for example. Given the amount of tourism in the area, they have organized and set the fee for their services. Sherry Ortner's analysis of mountaineer-Sherpa relations in the Nepalese Himalayas emphasizes the importance of payment to the Sherpa porters (1999:66-67). Without wages that porters considered worth the extraordinary risks involved in their work, most would not have ported foreign mountaineers up Mount Everest. With her analysis, which includes a broader appreciation of the role of wealth within Sherpa culture, Ortner helps dispel (or at least diminish) the romantic ideas among some foreign mountaineers that the Sherpas were in it for the love of the mountain (1999:202).

The SVE never has established set rules regarding how much to pay the baquianos. In fact, according to Pérez the topic was often debated within the group. Some, including himself, argued that the baquianos should be paid more than just a token amount. Others, such as Galán, cautioned against excessive amounts that would threaten collaborative and seemingly egalitarian quality of the affair. Both perspectives were deeply (and I believe genuinely) concerned with exploitation. It is important to note that Galán's view was a commentary on the ways he perceived both his baquiano friendships and the SVE: By paying more, the impression might be given that the group was made up of wealthy members. In fact, the personal wealth of individual members at any one time of the group's existence always has been variable, with some truly making an effort to come up with their share of the pooled resources to pay for gas, food, and, in this case,

baquianos. Thus, “more pay” for baquianos could, at least in theory, stress the apparent egalitarian quality of the SVE’s own internal structure by burdening some members much more than others.

This is a topic that begs further investigation. There is, however, evidence to suggest that despite the presence of pay (in the form of money), the SVE-baquiano relationship was not the kind that characterized the mountaineer-Sherpa situation or even the more evidently exploitative arrangement of the 1951 Orinoco headwaters expedition. To begin to appreciate the difference, we must understand that this was not just an SVE-baquiano relationship, but one that developed within a particular kind of landscape that both groups experienced and valued in complementary and perhaps even shared ways. Moreover, these were relationships forged over many years. Thus, I evoke the notion of “encounter” with caution: although my present case has much to relate to the literature on cultural encounters that I have briefly referred to, in other ways it departs from it. The longevity of these relationships, based on shared experiences during many expeditions, is an example of this.

As Ortner notes, the Himalayan mountains were sacred to the Sherpa (1999:128-130). This sacredness involved a distanced reverence and respect. In other words, Sherpas did not venture up mountain peaks. They only began to do so as part of the growing popularity of adventure sport and travel that Westerners initiated in the early 1930s and which dramatically expanded and accelerated after the WW II (Ortner 1999). While there were some Sherpas that embraced the sporting challenge of mountaineering and even exhibited competitive ambitions among themselves and even with the international mountaineers, the concern about polluting, about disrespecting the mountain

have remained very strong (Ortner 1999:127-130). Again, I am limited here by my own ethnographic scope; I have no direct evidence regarding the baquianos' views of caves in terms of their sacredness. I cannot ascertain whether or not the Chaima indigenous worldview that anthropologist Marc de Civrieux describes (1998) was (is?) relevant to the baquianos of Mata de Mango specifically or even to the broader indigenous and mestizo community living in northern Monagas and southern Sucre states. Galán considers most of the baquianos he has personally known as Chaima descendants; only a few maintain "their traditions." It is certain, however, that Domingo Maita was one of them. It also appears that the baquianos who joined the SVE expeditions while Maita was alive highly respected him as a shaman, as a cacique. Thus, it is probable that his beliefs might have influenced/reflected other baquianos' conceptions of and practices within the Mata de Mango landscape, including their incursions into caves and their guácharo hunts.

This brings me to a key point, and that is that unlike the Himalayan Sherpas, baquianos *did* venture into caves independent of the SVE's speleological goals. As I have already noted, they did so to hunt for guácharos but also to *explore*. We know what this experience meant for the speleologists, both in terms of embodied practice and the broader meaning of *la Sociedad* as a unique project that celebrated collaborative and democratic forms of civic science in Venezuela. Based on the speleologists' accounts, it appears that baquianos deeply enjoyed the experience of venturing into caves (although they did not always do so *along side* the speleologists during their expeditions together). The possibility must be considered that the intensely embodied encounter with stone, within an underground landscape that *opened up* in unexpected ways, appealed to these men in ways that similarly captivated their speleological counterparts. What we do know

for certain is that they (the baquianos) were willing and able to traverse passages together, engaging in the teamwork that cave exploration and survey demands.

The camaraderie that such engagements engendered extended beyond caves themselves to the greater karst landscape. Part of this camaraderie, it appears, was based on the speleologists' performance. According to Pérez, Maita repeatedly expressed his pride in the *caraqueños*' abilities to keep up with his pace along arduous hikes and to carry their own bags. It is Pérez's interpretation that men such as Maita and Zapata felt great honor in having SVE members depend on them for their wellbeing deep in the Monagas karst. Both Pérez and Galán coincided in the belief that the baquianos acted as hosts to visitors in their own backyard. Many times baquianos swiftly constructed a refuge with banana leaves under which the explorers would sleep or share the day's hunt. In Maita's obituary, Galán notes:

How many times have we not exited a pit, well into the night, under inclement rain, and there awaited Maita to help us with ropes and guide us back to camp, where a [recently hunted] and roasted limpet or armadillo waited for us while we explored a cavern. [2001:70]

The tasks of building a refuge, clearing a path with a machete, carrying some of the explorers' collective equipment (typically ropes), and cooking a meal might well describe the kinds of arrangements between tourist/explorers and their paid guides. However, viewed from the perspective of hosts honored to provide for their guests, these tasks take a different hue. (In my knowledge, SVE members *never* required their baquianos to perform any of these tasks beyond the arrangement, set before the start of the trek, of helping carry some of the shared climbing equipment, typically ropes.) Moreover, these were tasks that embraced the baquianos' unique skills and knowledge of *their* environment. As Pérez described it, "These guys would prepare a limpet as if to say, 'We

do this because *you don't know how.*' I never saw Domingo *serv*ing me. Much less Zapata. That would have been deeply embarrassing" (Pérez, Personal Communication, August 8, 2011).⁹

I asked Galán what was "in it for them." In his view, based on conversations with Domingo Maita, they (the baquianos) "did good [because by doing so] nature would be good to them." Galán insisted on these men's relational conception of nature and in their own poetic capacity to acknowledge its beauty: "[With Maita] we spoke about the beauty of stalactites, he did so with pure poetry, I don't know where he got his words. I was very fortunate to get to know Domingo. His teachings have been very valuable to me." In Galán's view, Maita's appreciation of nature emphasizes the apparent contradiction between science and mysticism. "Science is cold ... its terminology is castrating, along with the ideology behind scientific thought ... of course there is something magical in those sacred spaces" (Galán, Personal Communication, August 5, 2011).

I have chosen to consider Pérez and Galán's interpretations and recollections of their relationships with the baquianos of Mata de Mango as examples of "encounters"

⁹ Pérez and Galán's suggestion that we think of the baquianos as their hosts leads us to ask how might have these relationships affected the baquianos' relations within their own communities. Did Maita's affiliation with the speleologists translate into social capital that bolstered his position as a cacique? Were there other men in their community that aspired to participate in an SVE expedition but were kept from doing so by Maita himself? For example, in the 2002 Mata de Mango expedition, Pérez expressed the concern that the three baquianos José Roberto Cordero, Abraham Cordero, and Francisco Brito had not had a direct say in how much they would be paid per day. Instead, their wage was determined between their community elder Miguel Morocoima and the SVE expedition coordinators. Because of this, Pérez asked that their pay be raised. Fellow SVE members Carlos Galán and Francisco Herrera cautioned that doing so could dishonor a previous arrangement. They also put forth the counterarguments noted in my discussion above. How precisely did SVE involvement impact community dynamics? Might they have encouraged hierarchical arrangements within the communities that their baquianos called home? These are all critical questions that a thorough ethnographic inquiry into the "indigenous" side of the "encounter" needs to address.

that appear to deviate from the trope of the exploitative relations between the “Westerner” and the “Native.” I want to suggest thinking about their encounters, which were repeated over a period of three decades, in terms of friendships forged through collaborative engagements in/with a particular kind of landscape. This was a landscape that promoted, indeed *demanded*, teamwork and did not lend itself to the competitiveness that often characterizes mountaineering. The only way that Pérez could survey to the apparent end of Bastimento 1 was with Zapata’s help. In turn, Zapata benefitted from Pérez’s climbing equipment to explore beyond the point he would have reached with his own techniques of exploration. Hiking through the forest, the baquianos set the pace. It was the speleologists’ challenge to keep up. There was no evident payoff in getting there first. First where and for what? The geographical goals of expeditions were hardly as evident as a mountain’s peak. This was true both along the hikes in the dense vegetation and closed valleys and within caves themselves. On Everest, the goal is clear. It also is evident who made it to the top first. Moreover, porters make repeated ascents, making them the indisputable experts. As Ortner notes, their expertise sometimes threatened international mountaineers’ sense of accomplishment (Ortner 1999:170, 192). Mountaineers not only competed against the mountain, but also among themselves and with the Sherpas. I do not contend that the mountain *caused* these behaviors, but it certainly made them possible.

I will push this contrast further. Ortner makes clear that most Sherpas questioned the goal of reaching Everest’s summit, often with extraordinary cost of lives (to both Sherpas and foreigners) (1999:6-8, 127). The fact that more and more westerners were drawn to repeat the feat may have added to the sense of purposelessness from the

Sherpas' perspective. In contrast, SVE expeditions explored and surveyed “new” caves every time. A repeat visit was necessary only if previous attempts had not been successful for one reason or other. Thus, no particular cave became a recreational stage for adventure-seekers willing to measure their might against the challenges of nature, as some might judge the case of Everest and its climbers. (This difference, however, does not absolve speleology from the “conquering” gesture that characterizes mountaineering, but this is comparison or characterization that cannot be done lightly. I address this point below and again in Chapter 7.)

It appears, then, that baquianos understood and even supported the SVE cadastral project, at least indirectly, by their willingness to lead speleologists to unsurveyed caverns and to repeatedly point to other potential sites worth exploring. At times speleologists shared their surveying progress with their guides. This was the case with Pérez and Zapata in Bastimento 1. Pérez recalls showing Zapata his field book where he was noting the survey measurements and the sketch of the cave. According to Pérez, Zapata took interest and quickly grasped the fundamentals of the practice. “I am sure if I had given him the necessary tools Zapata would have surveyed on his own.¹⁰ He had an extraordinary spatial conception of the cave” (Pérez, Personal Communication, August 8, 2011).

Spaces of Ecstatic Encounter... but also of Socialization and Alienation

In Chapter 3 I suggested we think about the cadastre as a boundary object in its capacity to bring together the diverse membership of the Venezuelan Speleological Society. Here I

¹⁰ By this Pérez meant that Zapata and him could have traded the place of sketcher and tape leader that I describe in Chapter 4.

propose extending that argument to include men such as Domingo Maita and José Zapata who repeatedly joined the group's expeditions to Mata de Mango and critically contributed to their success. Much like the non-scientifically inclined of *la Sociedad*, the baquianos appeared particularly attracted to exploration, not just within caves but beyond them as they hiked along the heavily forested ridges and valleys of the region that they knew best. This invites thinking about speleology itself as a boundary *practice*. Its collaborative and embodied qualities also set the stage for "ecstatic" encounters in which speleologists and (it seems) baquianos enjoyed intense experiences of risk-taking and sharing during evening camps. Even if these men's conceptions of the spaces they traversed were not the "same," shared practices may have promoted "transcend[ance of] psychological and social boundaries" at the moment of encounter (Fabian 2000:8-9).

But just as speleological pursuits united diverse actors in the ridges and pits of Mata de Mango, they also alienated others, this time within the SVE itself. This occurred as some in the group embraced a different approach to exploration, one characterized by a minimalist ethic. As I will show, this ethic was intimately tied to notions of identity and ideology beyond speleology itself.

Speleological Practice and the Minimalist Ethic

I have joined Carlos Galán in three SVE expeditions in Venezuela. Every time Galán's stamina and stoic minimalism expressed in everything from his talk to his gear has impressed me. He packed his old blue bag without sparing a gram, volume as much of a premium as the white space on the paper he used for correspondence. Throughout each trip he wore the same clothes, ate little, but smoked constantly. In 2002, when I first

joined, along with my father, an SVE expedition to Mata de Mango, I recall him saying of his friend Galán: "That son-of-a-bitch [coño de madre] always has been and will always be like that, waiting for the rest of the group puffing a cigarette."¹¹

From his strong and lean body, his choice and manner of packing his expedition equipment, and his determination to get the job done in the field, Galán epitomizes a minimalist ethic that pervaded much but not all of the Venezuelan Speleological Society in the 1970s.¹² This minimalism was not always the concern, much less the imperative, of Venezuelan speleologists.¹³ In an article that provides a retrospective view on the SVE's

¹¹ Galán recently joked with me regarding his smoking and my endless questioning of his experiences:

You see that many caves are sites of power. For their natural radioactivity and the elevated ionization in the air, they transmit positive and youthful energy, even to smokers like myself, ha, ha. Take note of this for your anthropology of caves, I am serious. [Galán, Personal Communication, December 1, 2011]

¹² This was not unique to their time and place. As Ortner notes, a similar ethic became dominant within the mountaineering culture at around the same time (1999). New developments in technical equipment that was lighter, smaller, and more effective also broadened the horizon of what was possible. Specifically, this opened the doors to smaller expeditions in terms of participants and equipment. This shift also signaled a rejection of the militaristic and hierarchical arrangements of expeditions in the past. Most of the SVE members who embraced these changes were either close to or personally engaged with their practice outside of speleology. As I have already mentioned, Galán spent several years climbing mountains in southern Latin America. Pérez also pursued mountaineering, rock climbing, and other "extreme" sports two decades prior to the coining of the term and their commodification. The community of these "proto-extreme sports" enthusiasts was very small in Venezuela in the 1970s and 1980s and their ideas and practices spilled into speleology.

¹³ In a 1962 group picture that has become emblematic of a by-gone era, the 8 members of the Speleology Section of the Venezuelan Society of Natural Sciences embody the essence of *the Explorer* (Fig. 6.2). Wearing construction overalls, knee-high boots, and fiberglass miner helmets with an attached carbide lamp, the men, in their "proud and determined posture" wearing "travelers' quasi-military garb," exhibit a "proud and determined posture" (Fabian 2000:5). As both pictures and personal accounts reveal, some of these cavers wore belts with knives or even guns, items they deemed part of the proper equipment to meet the field challenges that a speleologists, in their view, might face.

55 years of exploration, the authors (one of them Galán) attribute part of the shift in exploratory techniques and approaches to the geographical and geological challenges posed by unexplored caves:

When searching for new horizons [of exploration], since the caves of easy access had been explored, springs forth on its own the notion of lightweight [exploration], of small, autonomous, and efficient equipment. This also obeyed a geological imperative. [Urbani, Galán, and Herrera 2006:21]

Until the early 1970s, most explorations had been carried out in "places of relatively easy access, in predominantly horizontal caves, and at most, in vertical pits with only a short succession of small drops" (2006:21). Whenever more substantial drops were encountered, such as in the case of Walter Dupouy Cave (east of Caracas), a ladder would be used (SVE 1975:114-119). This 1,122 meter-long cave has a number of drops throughout its development, totaling a vertical distance of 120 meters. The most challenging of these is towards the middle of the cave. At 10 meters, this drop—a waterfall—plunges into a subterranean lake dubbed "Lago Isabel," after de Bellard's wife. The SE-SVCN cavers overcame this obstacle as did most of speleologists at the time: with an electron ladder. French caver Robert de Joly (1887-1968) first designed electron ladders to aid in his own ambitious cave explorations in Europe. They quickly became popular among speleologists given their lighter weight and strength. Electron ladders are made of steel cable wire and aluminum footsteps. Although these ladders can connect together to expand their length, their safe use to overcome vertical distances is limited. For one, the explorer had to be able to secure the ladder at the top prior to a pit descent. Thus, if exploration required climbing up a steep wall, and no conventionally sturdy

ladder was available, the electron ladder—itself a hybrid between a conventional ladder and rope—would be useless.¹⁴

The SVE's retrospective article points to the lack of proper equipment as another factor explaining the limits of exploration of the earlier generation of speleologists.

Description of this fact, however, is tinged with judgment of how an explorer *ought* to traverse the karst landscape. In the old timers' explorations, the authors remark,

[i]numerable equipment items and supplies had to be transported for work in the caves. The explorers carried on mules countless bags (that included

¹⁴ In 2008, I used an electron ladder during a short weekend trip with some members of the SVE and the Universidad Central de Venezuela's Centro de Exploraciones e Investigaciones de Campo (UCV-CEIC) to Walter Dupouy Cave. The ladder was secured with rope to a protruding boulder just above "Lago Isabel." Water gushed down the passage and along this wall. I carefully observed the proper technique: one must make an effort to turn the ladder perpendicular to the rock, lest one's fingers get clipped by the aluminum steps and cable wire draping the rock. Going down feet first requires placing the heels of the feet on each rung. During my descent I struggled to keep my form, the cable ladder turning and painfully clipping my extremities against the wall. I tried to use my elbows, knees, and toes to separate the ladder from the stone; but it was very difficult, especially since it now bore my entire weight. I finally managed to descend the short pit. Exhausted and bruised, I gained a greater respect for the "old timers" who routinely used ladders in their caving exploration.

Some cavers who trained in the ladder tradition evoke the bygone era, which by the 1970s gave way to more technical rock and mountain climbing techniques, with a sense of nostalgia. Italian geologist and caver Paolo Forti, already in his 60s, expressed that cave exploration with the ladder required more teamwork, more trust invested in one's partner, who would help secure and stabilize the ladder while one either descended or ascended its wobbly rungs. Not so with more technical rock and mountain climbing techniques, which he argues allows for more solo work. Not all cavers share this opinion, however. My father, who lived the transition from the electron ladder to the new climbing techniques applied to cave exploration, was happy to see the ladder go, describing it as inefficient (it is bulky and heavy to carry for the amount of meters it allows you to overcome), cumbersome, and dangerous. He dismissed the idea that the ladder promoted greater teamwork. Whatever the opinions, it is beyond question that new climbing techniques exploded the exploratory capacities of cavers, and it did so in a way that also helped minimize the impact on the cave rock itself. Caves with extensive vertical development became accessible to explorers' bodies and shining lights. Speleological practice delved into depths unimaginable. The current world record of deep cave pit exploration is held by a team of Ukrainian cavers for their exploration of Krubera Cave in the Arabika Massif of Abkhazia, Georgia. As of 2007, this cave is 2,191 meters deep.

work tables, folding chairs, tarps and tents, gas lamps, hammocks, nets for bats, innumerable and heavy equipment including cages for living mice for mycological studies, materials for archaeological excavation, and the most diverse implements imaginable) to set up camp at the mouth of the cave whose access did not involve long trajectories. This was the case with Guácharo [Cave], el Agua Cave, Alfredo Jahn, and many others. A system of lightweight exploration by foot, in which all of its members carried on their shoulders all of the necessary equipment for a week of fieldwork had yet to be conceived. [2006:21]

This description reveals the contours of the minimalist exploratory ethic that Galán would embody and enact in the field. This system of lightweight exploration was and is not just about the equipment available to the explorer or even a geological imperative. It was and is about embracing the idea of self-sufficiency in the field, of packing only what is needed, and to carry it yourself, *on foot*. Viewed in the context of naturalist activities in a post-colonial context, this self-sufficiency also may be read as a rejection of the imperialist model of science and exploration. As Ortner notes, Everest expeditions increasingly adopted this perspective in the 1950s (1999). In the context of speleology as a field science, whether or not particular members embraced and enacted this ethic also points to the complex dynamics that furthered, united, but at times also strained the collective enterprise of *la Sociedad*.

The description of the “old timers” exploratory practices also contains a judgment on material excesses. Despite his climbing and athletic skills, and attraction to the sporting aspects of outdoor activity, Galán has been and remains concerned that sports (and its related equipment) further speleology. In a 1980 letter to Franco Urbani, then president of the SVE, Galán states concern with the embrace of new climbing gear without focusing on the purpose of their use: "Personally I fear that the novelty of the jumars and the exploration of large deep pits instigate sports caving tendencies

[tendencias espeleítas] contrary to the scientific practice that has characterized the work of the SVE for so many years."¹⁵ Galán scoffs at sophisticated and expensive equipment that serves no purpose. Worse yet is sophisticated and expensive equipment used in exploratory pursuits that claim to be speleological but that in his view are more about individual showmanship than science. On this count Galán offered several illustrations. After the creation of the SVE in 1967, which followed the rupture between two of its leaders, Juan Antonio Tronchoni and Eugenio de Bellard Pietri, de Bellard went on to reconstitute a new speleological group, again under the umbrella of the Venezuelan Society of Natural Sciences. This group once sponsored a scuba-diving exploration of several sumps in Guácharo Cave. To Galán, these efforts were completely useless, more about showmanship and promotion than about cave science. Even more than de Bellard, many SVE members constantly contrast their exploratory and scientific ethic to that of Charles Brewer, a popular personality in Venezuela, widely recognized by the general public as the country's premier explorer and naturalist.¹⁶ Galán scoffed at some of Brewer's claims in cave discovery and exploration, many of which resulted from aerial surveys and, the SVE argues, improper measurements. To Galán—indeed, to many members of *la Sociedad*—these practices are symptomatic of "facilismo" – the easiness or shortcuts with which money, success, or power were increasingly being achieved in "Venezuela Saudita" [Saudi Venezuela] where oil money and its associated cult of wealth permeated all of society (see Perera 1976a).

Even as Galán decried “sports caving tendencies,” however, he embraced a minimalist ethic that in practice was hardly different from sports caving pursuits. While

¹⁵ See Chapter 1 for a fuller discussion of the definition of the term *espeleista*.

¹⁶ See Chapter 3 for more on Charles Brewer.

the ends might have deferred, the means of achieving them overlapped. This ethic, which, according to the SVE retrospective article noted above corresponded to a “geological imperative” (Urbani, Galán, and Herrera 2006:21), altered the composition and dynamics of exploration teams. Less sports-oriented (and typically, although not always) older members opted to participate in less physically and technically challenging outings. The embrace by some of these exploratory techniques effectively created a group of elite speleologists within the SVE. Dubbed “los cunagueros” (the ocelots), these few men were able to push the boundaries of speleological knowledge in Venezuela. In the particular case of the Monagas karst, these men’s capacities and skills also created the possibility of long-term engagement and collaboration with Chaima baquianos. At the same time, however, they created rifts within the SVE and concern for those who emphasized the collective ideal of the speleological enterprise.

Some of the newer members to the Society in the 1970s and 1980s took on the challenge of joining the “ocelots” on their grueling expeditions to Mata de Mango. This was an opportunity for them to learn from the experts, a process that involved socialization and embodied disciplining that could either make or break an aspiring speleologist (or at least SVE member). Despite the emphasis on expeditions during long vacation breaks, many trips were done over the weekend, with barely any time to sleep. Alejandro Reig recalled his first trip to Mata de Mango in the 1980s when he was a teenager (Reig, Interview, July 6, 2007). On their hike back to the cars that they had left in the community of Yucucual, he could not keep up with the pace of the group. He stopped in the middle of the dark jungle and fell asleep. Next thing he knew my father, who had to turn back to find him, was shaking him, telling him to wake up: “¡Despiértate,

carajito! (Wake up, kid!)" Falling behind was not an option, since a long drive back to Caracas awaited. Several of the expedition members needed to work on Monday morning. Jose Antonio Lasso, a contemporary of Reig, also reminisced on the intensity of Mata de Mango outings (Lasso, Interview, January 13, 2008). On his first trip he was miserable, literally unable to keep up with the hiking pace. He recounted how at the time he made the commitment to get into shape, so as not to be left behind, an effort that paid off in future expeditions.

These stories are part of the SVE lore regarding both the Monagas karst and the cavers that pushed the exploratory and survey efforts in the region. When juxtaposed with the accounts of caver relations with the indigenous baquianos, I suggest we move away from the sports versus science dichotomy that in the case of Sarah Cant's analysis of British speleology appeared to explain much of the internal divisions among differently positioned actors (2006). In the rugged hills of Mata de Mango, with its predominantly vertical pits, "sporting" abilities are an important part of what made critical long-term relations with baquianos possible. Both, in turn, result in the growth of speleological knowledge. And yet, some SVE members question arrangements that result in only a few very elite cavers successfully participating in a caving expedition. To Francisco Herrera, who has been a member of the SVE for over 20 years, doing speleology also is about sharing with friends, enjoying the outdoors, about being part of a more inclusive team. Omar Linares, who joined the Speleology Section as a teenager along with my father in 1965 and then remained an active SVE member for many years, shared a dimmer view on the speleological elitism lead by Galán. To him, the rise of new exploratory technologies in the 1970s is to blame for shunning the participation of the older cavers ("los viejos").

Tronchoni, the most respected and loved of the “old timers,” offers an emphatic case against simple dichotomies (young vs. old, sports vs. science, etc.). Moreover, he reminds us of people’s changing perspectives over time. In the editorial of the Speleology Section's second edition of its bulletin *El Guácharo* (1965), he is emphatic about what constitutes a proper speleologist. Certainly, just visiting and exploring caves is not enough (that is what *espeleistas* do). Instead, a speleologist focuses on

the very diverse and uncommon study of hypogean fauna (biospeleology); the climatological conditions, temperature, humidity, underground currents (speleohydrometeorology); the intricate study and survey of underground galleries (speleometry); the varied photographic techniques (speleophotography); etc., in addition to the geological, archaeological possibilities and exploratory techniques... [all of this in addition to] intense teamwork... discipline and a spirit of camaraderie... skill, agility, and physical strength... Those who do not feel the calling of our "world," to work in some or all of the noted activities, will never be true speleologists. [Tronchoni 1966:1-2]

In an interview 40 years later, Tronchoni softened his stance. He regretted that “espeleismo” had become a dirty word among many members of the Society (as it had, for Linares and others). To Tronchoni, this attitude made the group at times throughout its history too exclusive, effectively jeopardizing its capacity to recruit new members and keep many who had interest in caves and the physical skills to explore them but no particular interest or professional ambition in science. In fact, in his own case, he had fallen in love, first and foremost, with the exploratory aspects of speleology, the very “espeleista” qualities that at one point he decried as a threat to the “goals of this young science,” but which he recognized characterized institutional Venezuelan speleology in its beginnings. Tronchoni’s view suggests that the field-based threats to speleological practice—the diversity of its practitioners, the difficulty of guarding its boundaries—are also its sources of strength.

Forging New Paths and Relations: 2002 and 2008 SVE Monagas Expeditions

The Monagas karst continues to yield new opportunities for exploration, mapping, and engagements with its indigenous community. Zapata died from a snake bite in the 1990s. Domingo Maita died in 2001. Another regular baquiano, Pascual Roque, had apparently left the area and settled in the town of Caripito. In a brief 2007 visit to the small community of Yucucual, I learned that Miguel Morocoima, the last remaining elder which whom the SVE had close ties, had passed away. Changes had occurred in the SVE as well. Older members left the group. Some, like Pérez and Galán, left the country, although Galán continued to travel regularly to Venezuela to join expeditions. New members who only knew of Mata de Mango by name joined the ranks. Moreover, the group shifted its focus to the northwestern region of Perijá in Zulia state to pursue the exploration of what turned out to be the longest cave in the country. There also was enthusiasm with cave potential in the Roraima region of southeastern Venezuela. These changes cooled speleological activity in Monagas, breaking the continuity that nurtured the unique relations I have described above.

Yet, potential for new caves in Monagas always remained. Galán had kept notes of Maita's many recommendations for future explorations. I turn to descriptions of two more recent expeditions to Monagas, one in 2002 and the other in 2008. With them I illustrate in greater detail the dynamics of speleological practice beyond caves themselves. They also point to changing relations both with the landscape and their indigenous inhabitants who traditionally have guided and even befriended SVE explorers in the past. I emphasize particular episodes that involve the kinds of socialization for us newer SVE members who have been part and parcel of speleological dynamics in these

mountains for over four decades. Exploration, science, and “society” –in the form of sociality both within and beyond *la Sociedad*—come together in the rugged Monagas karst, revealing their mutual definition, production, and hopefully, future.

The 2002 Expedition

In 2002, the SVE again returned to Mata de Mango for one of its Holly Week expeditions. Galán and his wife Mariam flew in from Spain.¹⁷ My father decided to join as well, embracing the opportunity to return to his country and share with old friends. I was a last minute addition, after my mother decided not to travel due to a back injury. As I noted in Chapter 1, this experience spurred my interest in speleology and eventually led to my dissertation project.

The 2002 Mata de Mango expedition again relied on baquianos. With Maita gone, the elder Miguel Morocoima helped coordinate who would guide us into the forested hills. He chose José Roberto Cordero, Abraham Cordero, and Francisco Brito, three men who knew the landscape well given their numerous trips to hunt guácharos in the region’s caverns. Morocoima began the trek with us as well, but soon turned back because of a painful hip (he walked with a cane). The Corderos and Brito also helped carry some of our collective equipment, mostly ropes. They did so in makeshift backpacks out of fruit sacks and rope. They also carried their guns. On one occasion they hunted a peccary, which they skinned and smoked. Some they shared with us; the rest they packed to take home. At night they also prepared two shelters with their machetes—a tilted roof made of

¹⁷ Marian Nieto has been participating in expeditions alongside her husband Galán since the late 1990s. Her exceptional strength enables her to keep his pace, although she admits that Galán carries most of her personal items in his bag, making her load much lighter.

tree branches and banana leaves. The SVE members slept in their sleeping bags under one of them. The other was the baquianos'. One evening they treated us to guácharo meat that they had fried over a fire. I recall the sheen of the liquefied fat that collected at the bottom of the pan. It was then that I first learned of its prized qualities and value to the Chaima that I describe in Chapter 2.

During this expedition the Society explored and surveyed four caves: El Culta Cave (254 meters of passage), Cave of the Caituco (64 meters), Cave of the Chorro (171 meters), and Nueva Cave (632 meters) (SVE 2003:45-49).¹⁸ All of the caves were previously known to the baquianos, although precisely what this meant I did not ask at the time. Three of the four caverns were relatively easy to access (no technical climbing required). The smallest of the three, Cave of the Caituco, had signs of previous visitations; a number of stalactites were broken. The entrance of the Cave of the Chorro was a spectacular vertical pit that formed a waterfall. Here the explorers rigged their ropes and rappelled in. It seemed as the crevasse seemed to gobble them up whole. What they did underground struck me as a complete mystery.

The 2008 Expedition

During my dissertation fieldwork in Venezuela, I joined the 2008 SVE expedition to El Alto de la Palencia. This region, located along the northern flank of the Caripe Valley, is very similar to Mata de Mango. Again, we would need the guidance of expert trekkers. This time, however, arrangements had to be made in Las Margaritas, and not the Yucucual, the community that the SVE had traditionally visited and was home to Maita,

¹⁸ The meter values correspond to the development of the cave projected onto a horizontal plane (the “length” of the cave) (see Chapters 2, 4, and 5).

Zapata, and Morocoima. Since I was in Caripe during the weeks prior to this outing, I was assigned the task of making preliminary contacts.

After several attempts to coordinate with several Guácharo Cave guides or park rangers to accompany me, I decided to head on out on my own. From an area map, I knew Las Margaritas to be just east of the town of Caripe, along the descending slope of the Caripe Valley that ends in the town of Caripito. A series of public bus rides got me so far. During my two hour wait for I am not sure what, I befriended the young woman who managed a food store right across the bus stop. She promised to flag down a reliable and trustworthy ride to Las Margaritas. At the sight of a white pickup truck driven with two men, she gave me the thumbs up. I could not have been luckier. The passenger was Danilo Carrera¹⁹, who not only lived in Las Margaritas but suggested potential baquianos. I met two of them at Carrera's small shack that he shared with his delightful partner Ofelia.²⁰ Both Eufebio Morocoima and the older Alex Matos were introduced to me as extremely experienced hunters who grew up trekking the region's forest.²¹ Eufebio's last name immediately signaled to me that he was of Chaima descent (de Civrieux 1998; Zapata, Interview, September 9, 2008). I explained what the Venezuelan Speleological Society was and the purpose of the upcoming Holy Week expedition. I explained too that the Society had a long history of exploration in the region, particularly towards the area of Mata de Mango, beyond the community of Santa Inés and Yucucual. I also stressed that Domingo Maita and Miguel Morocoima, both now deceased, had closely

¹⁹ A pseudonym.

²⁰ A pseudonym.

²¹ Both pseudonyms, although I preserve Eufebio's actual last name of "Morocoima," since it is a very common last name and, according to Chaima activists, a marker of Chaima ancestry.

collaborated with the cavers in many of their expeditions. I brought with me a copy of the 40th *Boletín*, which featured a picture of Maita next to the map of a cave he had helped explore. True to what several past and current members of the Society had explained to me, I used the *Boletín* as a presentation piece of the group's profile and activities.

I caught myself eager to prove that the Society was not an eco-tourism enterprise. I also did not want to give the impression that the Society was out to hire a guide for an ecological excursion. "We are different," I recalled Francisco Herrera telling me, stressing that the Society aimed to establish collaborations with a sense of exchange, of informal partnership, in contrast to the more blatant consumerist tourist-host model that pervades so much eco-tourism. And yet, I was to hint that we (the SVE) would provide some form of retribution. How to do so without spurring false expectations? As I entertained these anxious thoughts, Alex Matos started laughing with surprise when he recognized the picture of the late Domingo Maita in the SVE's journal. "He was my cousin!" he said.

Both Matos and Morcoima expressed eagerness to join us. They did so prior to my mentioning anything about pay. It is my impression that their eagerness was less about helping the SVE than having an excuse for a long trek in the mountains. Missing those long treks were precisely Morcoima's words. He worried, however, that a chronic muscle pain would keep him from joining us. He asked if I could bring him some ibuprofen. I agreed. They also asked for flashlight batteries and ammunition for their homemade rifles. After finishing the nth cup of coffee, I thanked the gracious Ofelia and

bid farewell to my potential baquianos, all agreeing to meet up again at the same place the weekend prior to Holy Week.²²

My SVE friends arrived to Caripe from Caracas on Saturday March 15th in the afternoon.²³ They came in two cars. One was SVE president Joaquín's small personal sedan. The other was an old Toyota Landcruiser, property of an ecology project that Herrera directs at the Venezuelan Institute of Scientific Investigations (IVIC). The car

²² Feeling that I had successfully completed the first part of my mission, I turned my focus on gathering the requested items. The ibuprofen and the batteries were easy to find. The *conchas*, however, were another matter. I started my search at a hardware store. I was told they had none. Similarly with 2 other stores. By the fourth shop, the salesclerk mentioned to me that he had none, and even if he did, he would not sell them to me, since they were illegal. At first I assumed he was teasing me, but as I later found out, this was in fact the case. Regretting not having consulted first with my Caripe host family, I managed to announce to half the town of Caripe that I was searching for illegal rifle ammunition, surely raising suspicions as to what I had in mind. My friend Beatriz De Bellard warned me against buying ammunition for the men, commenting that she had heard of individuals targeted by guerillas who were in search for the prized commodity. As ludicrous as that suggestion struck me—especially since I was only to buy enough for 10 shots—I began to worry about the consequences of the goods that I would provide our potential guides, especially since I would do this on behalf of the SVE. I contacted Francisco Herrera for advice. He dismissed De Bellard's suggestion, along with congratulating me for promoting non-ecological practices (hunting). While he meant to nudge me with a joke, I grew concerned with the consequences of my purchases... and ingenuousness.

The *conchas* pursuit ended with the help of Danilo Carrera, whom I bumped into at the Caripe market. He accompanied me to a store that is known for selling the illegal ammunition. Sure enough, the teller was quite hushed about the transaction, unwilling to give me a receipt. Each *concha* BsF. 7, or \$3 (at the official exchange rate). I walked out with 12 *conchas* carefully wrapped in a paper bag.

²³ As noted in Chapter 3, the members of this expedition were SVE president Joaquín Astort, a Spanish immigrant who started caving as a teenager in his native Spain, and continued his hobby alongside his job as an engineer at the Caracas Metro; Francisco Herrera, an ecology researcher employed in Venezuela's premier scientific institution, the Instituto Venezolano de Investigaciones Científicas (the Venezuelan Institute of Scientific Investigations, or IVIC); Luz Rodríguez, an earthquake geologist from the Fundación Venezolana de Investigaciones Sismológicas (Venezuelan Foundation of Seismological Research, or FUNVISIS); Maribel Ramos, a biologist working on a research ecology project that Herrera directs at the IVIC; Juan Acosta, an electrician from the Metro of Caracas; Carlos Galán, a biologist working at a research institute in Spain; Galán's wife, Mariam Nieto; and myself.

needed repair, which Joaquín provided in return for borrowing privileges. We were eight in total, and for the first time in SVE's history, the number of women equaled the number of men.²⁴ After picking me up from my host family's home, we drove to Las Margaritas (a one hour drive on a narrow and winding road). Everyone was eager to meet the prospective baquianos, hoping that indeed they would come through with their commitment.

Back in the Carreras' small home, we learned that Eufebio Morocoima would not join us since his muscle pains had worsened (I left the ibuprofen for him with Ofelia). Matos would join us in a couple of days since some unexpected business had come up. We were assured he would find us without a problem. Another baquiano, Jesús Ríos²⁵, would take Morocoima's place. Later that evening, as we set up our tents in our hosts' lawn, a young boy came up to us to tell us that Ríos was drunk at a party. "Let's hope he shows up tomorrow," Francisco Herrera shrugged.

SVE veteran Carlos Galán had already been in the region before in a previous caving expedition. He suggested this return trip since other caves were known to exist that the Society had yet to survey and add to the national registry. The late Domingo Maita provided this knowledge, along with the assessment that these caverns would require long ropes to access given their seemingly extensive vertical entrances. Thus, the SVE made sure to pack ropes and climbing equipment. Both are heavy. They also are, along with meals, a tent, survey tools, cooking stove and utensils, "collective" equipment, e.g., items whose total weight had to be distributed among all members of the expedition. Herrera and Galán monitored what in their experience was the best weight among the

²⁴ See Chapter 3 for a description of all expedition members.

²⁵ A pseudonym.

bags. Not everyone was in equally good physical shape. Likewise, not everyone had optimal hiking equipment (bags or shoes). And, as Galán and Herrera made clear, we would move as fast as the slowest in the group.

Twenty minutes into our walk through the edge of the town of Las Margaritas, we stopped at Ríos's home, which he shared with his mother, Marta Morocoima, her last name again evidence of Chaima heritage.²⁶ While Ríos gathered his items in a large bag for transporting oranges with an improvised loop of ropes that imitated a backpack's carrying system, Ms. Morocoima offered us coffee. Galán lit what was probably his 5th morning cigarette, and spoke again to us about group hiking rules: If you see that the person behind you is falling behind, then it is probably that he is too heavy and you are too light. Offer to take some weight of him. Also, if you reach an intersection in the path, make sure the person behind you knows where you are going... These words would become the object of endless jokes, on the one hand, and a source of tension on the other, for as soon as the hike began, it became clear that the group consisted of people with different training levels, even different attitudes regarding rests, whether or not to converse with other while hiking, stopping to admire the local vegetation, etc. Galán was by far the strongest and most focused in the group. He also was the least patient with anything that was not directed to the task at hand: finding and surveying caves.

The hike led us, for the first day, through “secondary” forest. I learned from Maribel, an ecologist, to read for signs that the vegetation in this area had been recently tinkered with, mostly to cultivate coffee. The *bucare* tree (*Erythrina poeppigiana*), a popular choice for shading coffee plantations, was everywhere. Its orange flower

²⁶ First name a pseudonym.

carpeted our paths. By the start of the second day of hiking, however, there were no more *bucares*. We were in “primary” forest (what Maribel described as *zona no-intervenida* [non-intervened zone]). We also knew we were approaching the caves since limestone outcrops began to appear. While knowing the geological makeup of the land helps guide the caver as to where caves might be located, the only fool-proof way to distinguish a small rock shelter from a more extensive cavern is to get to its mouth and explore it.

By the next morning paths in the forest were barely discernible. We moved forward slowly, the pace set by Juan Ríos's clearing of the vegetation with machete in hand. Carlos Galán was right behind him. The rest of us trailed behind. Several of us chatted and laughed, sometimes quite loudly. At one point, Galán stopped and turned to look at us, with obvious disgust, telling us to quiet down. He stated that with so much noise we would scare away potential prey. Understanding this episode requires considering the history, spanning over 30 decades, of the Society's engagements with this landscape and its inhabitants. As I have noted, these engagements strived, at least from the part of the speleologists, to overcome the colonial trope of the foreign (being from Caracas is foreign enough!) naturalist/scientist/discoverer who "heroically" treks through the jungle while the nameless "native" clears the path with *machete* in hand, and carrying the equipment (Fabian 2000; Pratt 1992). Galán's concern recalls Pérez's perspective of the baquianos as their hosts guiding their guests along their turf. Of course, neither Ríos nor Matos invited us on this trek. Despite the friendly arrangement and the efforts to respect the baquianos' time and purpose deep in the Monagas karst, they remained fundamentally hired guides to the urbanite speleologists who, without them, could not get to those caves, draft their maps, and grow their national speleological project. Perhaps

after repeated expeditions with these men would the kinds of friendships and “ecstatic” encounters that Galán and Pérez recall with a hint of nostalgia emerge. Encounters would morph into relationships that approximated the camaraderie, the collaborative effort, and even, perhaps, a privileged glimpse into living indigenous practices... Only then might a baquiano no longer be a baquiano but a mediator between the spirits of nature and the speleologists (and anthropologists?) eager to learn their secrets.

The episode also involved a form of socialization for us newer SVE members. Responding to Galán’s call, as we all did, we strived to align ourselves with a particular ethic of exploration and encounter, whether consciously or not. I personally did not grasp the weight of Galán’s concern until after lengthy conversations with him and other SVE explorers who had repeatedly visited the karst of the region with their baquiano counterparts. The event also illustrated the capacity of some SVE members to impose their will by the weight of their character, despite the “horizontal” and “democratic” ethos of *la Sociedad*.

Three hours into the hike we reached the mouth of what we would call *Alto de la Palencia Sima 1*, following the naming rules that the Society had been following since the early 1970s.²⁷ The mouth of this *sima* (vertical cave) was imposing, a crack in the earth's surface longer than it was wide that quickly swallowed daylight in its rocky throat. Evidence of baquiano’s earlier exploration lay at the lip of the shaft's opening: we found an *empalizada*, a set of horizontal logs, about 3 to 4 meters in length, held by two other logs staked into the ground at either end. Expert guácharo hunters tie long ropes made of

²⁷ See Chapter 3.

a naturally fibrous plant (bejucos) to climb down and fetch young oilbirds from their nests along the inner cave walls. Often they explore further in, beyond the birds' nests.

Galán swiftly began the preparations for the descent. Purpose driven and silent, he picked up a large branch from the ground and threw it into the pit. The time it took for it to hit the ground confirmed we were staring into a deep cave. Startled guácharos made cackled loudly. Leaning over the edge I could see dozens of birds flying below. One of them slowly made its way up, defying the bright midday sun, and flew away from the cave entrance. Galán had already moved on to secure the climbing rope on a sturdy tree at the lip of the pit. For Astort, however, the tree was too close to the edge for comfort. "Carlos, let's attach a second security rope to another tree," but Galán did not deem that necessary. Astort stated plainly that that's how many caving accidents happen, confidence in one's skill leading to careless disregard for basic prevention. But Galán did not budge. Still, Astort and Herrera attached an extension of the rope to a second more firmly rooted tree, creating a loop where they could clip their own security rope while they attached their descent gear onto the main descent rope. On they went, Galán leading the way.

Rodríguez walked along the perimeter of the pit trying to find a spot where she could get a good GPS reading, but struggled due to the dense vegetation above us. The rest of walked around the area, seeing what we could find. No more than 10 meters from the lower lip of the larger entrance was another pit, about 2 meters in diameter, also covered with vegetation. Ríos cleared the area with his machete. Astort and Galán descended this pit as well. Although they could not physically connect this second pith with the much larger volume of the first, they could see light shining through a chimney. A simple surface measurement between the first and second mouths, and they could

approximate the length of that chimney, adding to the total distance of the cave system. As soon as Astort, Galán, and Herrera were all on the surface, Galán lit his cigarette and began sketching a plan and profile view of the cave in his field notebook. I watched him work closely, amazed at his swiftness, his ability to fiddle and project complex volumes in his head, that he would then define on paper and even further refine in a computer drafting application at proper scale. In his sketch he made note of the spot from where they collected a geological sample for geologist and fellow SVE member Franco Urbani to identify and analyze, as well as a spot where Herrera eyed a peculiar looking crab. Both samples were properly stowed away in bags and canisters.

From the two mouths of the *Alto de la Palencia Sima 1*, we walked downhill to another large cave pit entrance. This would be *Alto de la Palencia Sima 2*. The procedures to prepare for its explorations quickly picked up, Galán defining the pace of work. Log thrown. Guácharos disturbed. Rope rigged (at a more secure spot than in the previous cave), speleologists connected to the rope, and descended into darkness.

Astort opted to stay on the surface this time while Galán and Herrera explored and surveyed *Sima 2*. Us less experienced onlookers promptly came up with something to do. At *Sima 1* we practiced rope knots. At *Sima 2* we practiced our survey skills. Rodríguez, Acosta, and I made a survey team. Our goal was to establish the relative location of the entrances of *Sima 2* and *Sima 1*. This could be useful data when constructing the scale maps of the two systems. Perhaps they connected underground? Acosta was the tape leader. Rodríguez held the other end of the tape and the measuring tools: the compass and the clinometer. I was the scout, helping along the sides by approximating the lateral distances at each “survey” station, as well as the one writing down the measurements and

sketching the landscape. Astort was our willing and patient teacher. He guided Rodríguez with the placement and reading of her equipment (Fig. 6.3). Acosta too got suggestions as to where to stand and how to select the next stations. A bit rusty since it had been 4 years since my cave surveying class in Kentucky, I tried to remember which were the data columns I needed defined on paper. Station number, orientation, clino, left (in meters), right (in meters)... I quickly drew the columns. I was only to sketch a plan view of our survey, a view from the top, but my sketching often included some form of projection, of depth. I also got caught up with making it pretty. This might be forgivable given our relaxed working conditions. But in a cave that is wet and cold, after hours of exploration, the team relies on both the accuracy *and* swiftness of the sketcher.

As soon as Galán was out of *Sima 2*, he again lit his cigarette and sketched (Fig. 6.4). I realized that he did so mostly by memory, at least in these smaller and less complex caves. In fact, vertical shafts lend themselves to use the climbing rope as measuring tape. Stations are marked on the rope with a knot. Cavers then measure the distances between knots on the surface.²⁸

The last stop of the day was what would become *Alto de la Palencia Sima 3*. A much smaller looking pit, Maribel and I convinced the group that we wanted to lead the exploration. After a brief refresher in rappelling and ascending techniques, I connected my harness and rappel rack to the rope, leaned back towards the edge of the pit, and began my descent. Overcome by a mix of excitement and nervousness, my heart rate

²⁸ Ever the efficient speleologist, I would learn a couple of weeks later how Galán transposes his field notes onto the computer screen using the vector-based illustration software Freehand. His technique was full of swift tricks, avoiding unnecessary mathematical conversions or calculations. He stressed the need to consider what the map will be used for, how it will appear in final form. Too much detail in a map that will be reduced to 50% of its size will result in a blurry mess. It would communicate nothing.

increased and muscles twitched. Here I was, going down into a cave that most probably no other human being had ever entered. Might this pit lead to a long subterranean passage? It had happened many times before in these mountains.

I looked up, my friends' faces about 12 meters above me. As I approached the bottom of the pit, my friend Francisco cautioned, "Mari, watch for snakes." Holding the rope tightly to my right outer thigh, in "break" position, I looked down. The bottom of the pit looked dark and unwelcoming, not because of lack of light, but because of the wetness of organic debris collecting on the crevasse's floor. I imagined snakes in free-fall, torrents of gushing rainwater pushing them off the edge of the pit, down there, caught, waiting for a bigger pray, hungry. As my boots touched bottom, they sunk a few centimeters, the earth softly giving way to my weight. I looked around, and not daring take a step anywhere, I quickly disengaged from the rope and called out "Libre!" (Off rope!). Francisco continued to coach me along: "Mari, you can take this time to look around to see if you can find any leads." Right. I moved very slowly, eyes glued to the ground. I was scared. There was the beginning of a dark passage along one edge of the pit. A speleologist would not hesitate to drop to his hands and knees and crawl in. But frankly, I was eager to pass along the honor to Maribel. "Any big leads?" Francisco called out again. "Still looking!" I was trying to buy time. Finally, Maribel made it to the bottom of the pit, and eager to continue exploring, went down the hole, which ended up extending only a few meters before petering out. By the time we climbed out of the pit, it was almost dark. We quickly picked up our pace behind Ríos and Matos who guided us to our camping site for the night.

The very brief exploration of *Sima 3* was the last of this trip in the Alto de la Palencia. Galán would have had it otherwise. Four days of intense hiking with heavy backpacks were starting to take a toll. There was hope that during the return we would deviate northward to find a cave that Ríos mentioned was worth visiting, but that the SVE may have never surveyed. Yet, when we reached the point to decide whether or not to head to this cave, several people complained that they were too tired. The deviation would add at least two more camping nights, exceeding the days the original excursion had been planned for. Food was running low. Why not leave this cave lead pending for a future expedition? Galán vehemently disagreed. "I did not come here to massage my balls," he said. "This is a speleological expedition, not a tourist excursion." Francisco Herrera, who had been caving with Galán for two decades, and was, though not explicitly, the de facto expedition leader, tried to reason with him, but to no avail. Upset, Galán, along with his wife, decided to abandon the group, and hike that very evening back to the cars. Exhausted, the rest of us set up camp for the night nearby, and did not join up with the couple again until the next day. The discussion of the previous night was not mentioned again.

These descriptions of events that transpired during the 2002 and 2008 SVE Monagas expeditions broaden and deepen our understanding of speleological practice. Specifically, they open up speleology's inherent quality as both a sporting and scientific pursuit and reveal them as inseparable, in constant negotiations that forge identities in/of the landscape. In the context of the SVE's explorations of the Monagas karst, this quality is revealed as dynamic and shifting. Unlike the Sarah Cant's analysis of British speleologists who divided up between the scientific and non-scientific camps (2006),

their Venezuelan counterparts are neither one nor the other, but instead embody speleology's duality in different ways at different times depending on context. To be sure, the SVE has counted on the membership of those that had academic careers in the sciences and those that did not (see Chapter 3). However, in the context of *practice*, these categorical identities do not map directly (or even consistently over time) onto either speleology as a sporting pursuit or speleology as a science. SVE founder Juan Antonio Tronchoni, an insurance agent by profession, was one of the biggest promoters of the Society's identity as a scientific organization. In an effort to do this early on in the group's history, he rejected *espeleismo*, cave exploration devoid of scientific aims. Years later, aware of the difficulty to attract and retain new SVE members, he welcomed so-called *espeleistas* into the group, and hoped that fellow SVE members would do the same. His concern was not just about the longevity of the organization, but for the productive practice of speleology *as a field that requires both sporting and scientific efforts*. Pérez and Zapata plunging into Bastimento 1 Cave's deep pool was sports, in terms of physical effort, risk, team-work, even performance as both men measured each other's capacity to push onward both to the cave *and to each other*). It also was science in that they aimed to reveal the cave and survey it along the way. The national cadastral project, in turn, informed and motivated the survey. Carlos Galán, a trained biologist and only SVE member to practice speleology as a career was fastidious about guarding the group's scientific identity, while at the same time embodying a stoic athleticism to the extreme. Along with Galán in the field, newer SVE members learned both implicit and explicit social norms. Whether or not we embraced them beyond the hills of Monagas would determine the future not just of speleological practice but of *la Sociedad*.

But whose ideal of *la Sociedad* must be addressed. Dynamics in the field also reflect diverse perceptions of the group's identity. To Francisco Herrera, sharing with friends and forging new friendships in common pursuits is a critical part of speleology. To him, Galán's impatience at the end of the 2008 Monagas expedition was unreasonable. "We are who we are," he stated simply, with a shrug, accepting the fact that on that outing, most participants could not match Galán's physical condition or exploratory experience.

In the Monagas karst, forging new relationships extends to the expert indigenous and mestizo baquianos who have and continue to play a critical role in speleological success. Recalling Galán and Pérez's description of how they won the respect of men such as Domingo Maita and José Zapata, we might better understand Galán's concern during the 2008 expedition. To follow a baquiano's pace, swiftly and in silence, to exhibit exceptional physical endurance and mental determination to explore, might help forge relations of mutual recognition and respect. This in turn, might help dispel stereotypes of urbanite eco-tourists, or worse, "soft" naturalists exploring and collecting specimens in the shadow of their imperial counterparts of a century ago.

We must ask, however, whether or not there might be other ways of forging these relations of mutual recognition and respect. One evening during the 2008 expedition, Maribel sought out Ríos to invite him to have dinner with us. The following day Ríos shared with the group a bird he had hunted overnight. Another evening Juan surprised Maribel with a makeshift cake, topped with a candle, and a small bottle of rum, to celebrate her birthday. Again Ríos was invited to join us. In fact, all along the hike, Juan continuously offered candy and other snacks to everybody. This led to gratitude and half-jokes that judged a practice that breached expedition protocol: minimalism and self-

sufficiency when it came to packing, avoiding unnecessary weight. Fortunately for Juan, his capacity to keep up with the swifter hikers despite the extra load, spared him from more cutting critique, and even won him Galán's sympathy. At one point he commented not only on Juan's extraordinary strength and jovial disposition, but also on the remarkable fact that a man of his background could be a welcomed part of the SVE scientific project.²⁹

I end this analysis with by reiterating some of its glaring limits. Baquianos' own voice is lacking, as is a more thorough study of their lives outside of the Society's expeditions. I note that the 2008 expedition was the first in the group's history with equal numbers of men and women, and yet, I do not develop the topic of gender relations. Finally, I must emphasize my awareness of individuals' deeply complex lives and inner worlds that change through time, some of their qualities as hidden as the deepest caves of the Monagas karst. On this point I close with Galán. A 1999 letter from Spain that he wrote to Urbani, in anticipation of a trip to Venezuela to the Perijá Range, stands out from the rest of his years of correspondence for its more informal and sentimental tone. He shares with Urbani some of the travails of getting older (he turned 50 that year):

And so we may have to start to think about easier outings [salidas suaves] and more calm activities, because if not now, sooner or later it will catch up with us. And I also think that we have to enjoy a little, now that we can, because not all of life needs to be work to the maximum. Still I think that mountain expeditions as well as intellectual work are activities that can be effectively maintained until well advanced age, adjusting the rhythm according to the circumstances and the capacity of the organism. I recall—with admiration—the capacity of Domingo Maita (who was easily beyond his 70 years) or the more recent and closer example of my late grandfather, who would go out hunting until he was 92 and that beyond his 80 years he would take good day-long walks in the wilderness. In other

²⁹ As I note in Chapter 3, Juan Acosta was the least formally educated participant of the expedition.

words, by maintaining a certain level of training (and with the tricks of experience) we have a long ways to go [aún nos queda para rato].

Conclusion

In this chapter I have focused on the history and practice of speleological engagements in the Monagas karst beyond Guácharo Cave. These engagements are both with the landscape and the expert indigenous trekkers who guided SVE expeditions to caverns ever deeper within the karst frontier. These specific men—Domingo Maita, José Zapata, Pascual Roque, and Miguel Morocoima among them—forged long-term relations with specific SVE members who traveled to Monagas repeatedly to push the boundaries of speleological knowledge. In practice, they also developed and embraced a new ethic of exploration that shunned excess and encouraged extreme athleticism and determination. Their efforts caused rifts within the SVE, while at the same time furthering the group's cadastral project.

Like Sarah (Cant 2006), I also examine speleology's inherent duality as a sporting-scientific pursuit. In the context of the field practices of Venezuelan urbanites in the country's rural regions among its indigenous inhabitants, this duality presents itself as dynamic and complex. Critically, it begs attending to the specific qualities of the landscape in which they develop. I have suggested thinking about speleology itself as a boundary practice in its capacity to bring diverse actors together in practice.

I also invoked the notion of "cultural encounter" to think about the ways SVE-baquiano relations strived to break from an imperial mold of power relations. Here I want to end with an important limit to the speleologists' aspirations of camaraderie, of equal terms of engagement. Despite SVE members' efforts to acknowledge their baquiano

counterparts in their publications, cave maps capture not the “indigenous” view or their relations to that space but the speleologists’. More critically, once produced, published, and circulated, these maps could be used in ways that might impact indigenous livelihoods within the Monagas landscape. Indeed, this has already happened, albeit indirectly.³⁰ In 1975, the National Institute of Parks created the Guácharo National Park to include much of the karst area that the SVE has continued to explore over the years. The impetus driving this decree was the desire to protect guácharo colonies in the region’s caves as well as forests that provide them with food. This Institute also prohibited guácharo bird hunting within the parks boundaries. While these rules have had limited effect on the ways small indigenous and mestizo communities located deep within the forest engage with their environment, the building of roads threatens with greater incursions and policing by the state. Could speleological knowledge serve the objectives of territorial and exploitative interests of either the state or other private enterprises? This is the topic of Chapter 7.

³⁰ Geographer John Short broadens the notion of cartographic encounters to include map-making by both Europeans and Native Americans as a consequence of their “collaborations” (2009:12-13; Malcome Lewis 1998). To Short, a “symbiotic destruction” characterizes the terms of engagement, which involved choices and constraints, compromises and negotiations as well as conflicts and struggles, limitations on Europeans and exercises of Native American power, but set within the long-term story of eventual European victory and Native American defeat (2009:12).

Chapter 7

Territoriality and the Making of Nation

Prior to the 2004 Venezuelan Speleological Society expedition to Roraima, Francisco Herrera, its organizer, obtained the necessary permit from the Caracas office of the National Institute of Parques (INPARQUES). Or so he thought. This expedition required a state approval since its goal was to continue the exploration and survey of a cavern located on the summit of Roraima plateau, itself part of Canaima National Park. The permit granted the group a 5-day stay on the top of Roraima, enough time, Herrera hoped, for the Society to finish its work. After a 12-hour bus trip south into the Amazonas state, we loaded our expedition bags onto the top of a jeep that took us along a bumpy dirt road to the small town of Paraytepu. There, Herrera met with officials of the regional Inparques office that coordinates hiking trips to Roraima. To his great concern, the officials did not honor the original arrangements of the 5-day stay, stating that the SVE had three days instead. They explained that a tourism company was scheduled to take a group of foreign tourists to Roraima on days that overlapped with our visit. (On Roraima, comfortable camping space is at a premium, since there are only a few areas with sandy floors under sizable rock shelters.) Doing his best to not upset the officials, who now effectively held in their hands the fate of our expedition, Herrera emphasized the importance of the Society's work. He noted that its aim was not leisure tourism but

science, lead by Venezuelans dedicated to promoting national geological heritage. He further reasoned that it was unfair that nationals who follow the proper means to obtain permits to visit their own national parks should be made to bow down to the will of profitable tourism companies with foreign customers.

That the expedition had to be cut short to accommodate international tourists added salt to an open wound. This was not out of a xenophobic attitude towards foreigners (this SVE expedition, in fact, counted on the participation of three Spanish and one U.S. caver). At issue was the Society's imperative to finish surveying and publishing the map of what appeared to be an important speleological breakthrough: the longest quartzite cave in the world. Already members of the Slovak Speleological Society and the Czech Speleological Society had been exploring and surveying the same cavern, which they named Crystal Eyes cave (Smida, Audy, and Vlcek 2003). In 2005 the SVE filed a formal complaint to the International Union of Speleology claiming that these cavers had breached international caving ethical standards (SVE 2005). In the words of some SVE members, these Eastern European explorers were committing nothing short of an imperialist affront to Venezuelan speleological sovereignty.

How members of the Venezuelan Speleological Society have interpreted and handled both of these cases, the permit ordeal and the apparent breach of international caving ethics, point to the complex geopolitics of speleological practice. These geopolitics have both national and international dimensions amidst which, I argue, the SVE has aimed both to envision and enact a particular kind of nation. I show that these efforts always assert, whether explicitly or implicitly, the kind of relation citizens ought to have with the national landscape vis-à-vis the state's power to administer and control it

and them. In practice however, the lines between citizen and state often are blurred. This chapter examines some of these blurry boundaries more closely. In counterpoint to the arguments presented in earlier chapters, which present caves as distinct spatial domains hidden from technological and state reach, the Society's national speleological project is revealed here as potentially risky in so far as it could be appropriated by the state for purposes that most Society members might reject both on political and scientific grounds. Are cavers making caves visible for the state? That is a question I consider here, which members of the Venezuelan Speleological Society have asked themselves at different points of the organization's history, with different effects. Here I revisit the 1951 Orinoco Headwaters Expedition (Reig 2006/2007). Rivers as potential sources of scientific, military, and economic value contrast to caves as "empty" volumes. They contain neither land, people, nor resources, which might promote their appropriation and incorporation into either state or capitalist territorial regimes. Beyond the specific case of the SVE, this examination builds on work that counters that prevalent dichotomy in the social and historical studies of cartography that splits mapping as for/by the state/empire or against it.

Yet, like in previous chapters, the qualities of the karst landscape are emphasized in relation to the particular kinds of sociality they engender. Again, the geographies of speleology are shown to have complex and multidimensional spatialities. Their dynamics pervade geological, ecological, and political landscapes that explorers must learn to negotiate in order to practice speleology and explore both the caves, and alternative visions of, the nation.

Beyond State and Capitalist Cartographies

The 1951 Orinoco Headwaters Expedition was publicly celebrated as a commemoration of Humboldt's travels through Venezuelan in 1799. However, as Reig shows, strategic military and economic interests strongly shaped the pace and paths of the expedition (2006/2007). The exploration and later taming of the Orinoco through an ambitious hydroelectricity project, heeded the government's call to create an economic, civic, and cultural infrastructure that materially and symbolically transformed the nation's landscape. Reig takes this event as an important precursor to a series of grand scheme state projects bent on domesticating and exploiting the resources of Venezuela's Guayana, the first of which began during the Marcos Pérez Jiménez dictatorship in the 1950s. Central to his policies was the promotion of the 'New National Ideal,' seeking to create development alternative to oil (Reig 2006/2007:63). Economic development was not the only goal of the expedition, however. Critically, this region of southern Venezuela shares frontier limits with Colombia to the west, and Brazil, and Guyana to the south and east. Increasing state presence in these areas was seen as an important effort in asserting Venezuela's territorial integrity. The political leadership that followed Pérez Jiménez continued to foment his ideal of developing and policing the south, which in the early 1960s took the shape of the Venezuelan Corporation of Guayana (CVG) and the later Commission for the Development of the South (CODESUR). More broadly, these projects must be understood in the context of the Venezuela state's increasing consolidation as the "sovereign landlord over a national territory, as an economic agent with its own base of economic power" (Coronil 1997: 199, 293, 388).

To explore, to demarcate, to populate, to police, to prospect, to exploit, and to represent are all strategies that are part and parcel with a nation-state's efforts to define

its territory. Geographer Robert Sack defines territoriality as "the attempt by an individual or group to affect, influence, and control people, phenomena, and relationships, by delimiting and asserting control over a geographic area" (1986:19). The map—a visual representation that presents the territory as as a united whole—plays a key role in the definition of and how not just a nation-state, but also a colony or empire enact and imagine their power over nature and its subjects (Anderson 1999; Burnett 2000; Carter 1999; Edney 1999; Winichakul 1994). Critical in the capacity of cartographic representations to become associated with a distinct imperial or nationalist character is the definition and location of landmarks (Burnett 2000; Craib 2004; Olwig 2002). As the case of the 1951 Orinoco Expedition illustrates, to define and locate these landmarks requires geographical knowledge of the territory. Obtaining this knowledge, in turn, necessitates a systematic project the coordination and execution of which has and continues to be the domain of state (or colonial) institutions (Carneiro 2005; Scott 1998). These projects typically have involved people and tools in the field surveying the landscape, but increasingly during the 20th century, technologies such as aerial photography or satellite imagery have been aided or even replaced some (and sometimes all) aspects of these activities.

Scientific, political, military, and economic motives comingled within the 1951 Orinoco Expedition, all of them amplified by the river's status as a powerful national icon. For Venezuelans to explore and define its origins would augment its iconic appeal.¹ The river's proper measurements would translate, at least in theory, to the effective territorialization of the region, setting up the stage for greater militarization and

¹ As Reig notes, there was a concerted effort to expel the French counterparts of the mission in order to "nationalize" the enterprise (2006/2007:59).

exploitation of the region. However, only the *fiction* of the first was necessary to achieve the intended goals. As Reig notes, systematic hydrological measurements upriver were never made. Had they been done, they would have placed the Orinoco's origins beyond Venezuelan borders and in the Colombian Andes. Thus, "[r]ather than *discovering* [the main sources of the Orinoco], the expedition *established* [them] politically ... based on historical tradition and the geo-strategic need to situate, within Venezuelan borders, the birth of the country's major river" (Reig 2006/2007:59-60).

Throughout the expedition, economic goals were furthered as well. One of the hired workers (Delfin Acosta) was assigned with prospecting for gold in the riverbeds of all the creeks they passed up. At one point a bauxite seam was discovered, with the expedition scientists claiming its private ownership. As Reig notes, "[i]n a state-funded expedition, this resonates with the lack of distinction between private and profit in the initial days of the Venezuelan Republic, concerning the exploitation of rubber, timber and mining resources in Amazonas" (2006/2007:62). Beyond the Orinoco itself, the aim of revealing the rivers of southern Venezuela responded to a state-sponsored plan of domesticating, integrating, and exploiting the Venezuelan Amazon for its mineral and hydraulic wealth. In other words, exploring rivers contributed to the state territorial strategies that further objectified and exploited nature as source of wealth (Coronil 1997; Reig 2006/2007).

In contrast to rivers, caves hardly held any strategic scientific, political, or economic appeal to either state or capitalist enterprises. Speleology, I argue, did not align itself with the developmentalist and modernizing script that promoted other sciences such as chemistry (for the oil industry) or even zoology (for agriculture) (Texera Arnal 2003).

With the exception of Guácharo Cave, which stands out as the nation's first natural monument for reasons I describe in Chapter 2, caverns in general remain relatively invisible to the broader national imaginary as well, not just to state or capitalist interests. This fact is particularly interesting in the context of Venezuela, where oil and its derived wealth are crucial factors in the shaping of national realities and imaginaries (Coronil 1997; De Lisio 2005). In fact, the leadership of the Speleology Section of the Venezuelan Society of Natural Sciences hoped to appeal to state officials and the public at large by presenting caves as an extension of Venezuela's rich subsoil patrimony. This was and remains true in the technical sense: as part of the nation's underground, caverns *are* national patrimony. In contrast to places like the United States, where a private owner's topsoil rights extend to the underground, in Venezuela they are only surface-deep. This fact has far-reaching implications on the practice of speleology, as explorers attempt to navigate and at times circumvent what are effectively complex property regimes with greater or lesser powerful agents to exert their territorial claims.

Yet, the maps of over 700 caverns are accessible to anyone who wishes to seek them out. While the act of mapmaking *itself* may not involve appropriation of the surveyed space, the National Speleological Cadastre provides knowledge that could lead to territorial claims. I turn to one of these examples.

Caves as Spaces of Subversion/State Control?

Caves played a critical role in securing victory for the Cuban Revolution. Counting with the support of Antonio Nuñez Jiménez, the country's premier geographer and speleologist, Fidel Castro, Ernesto "Che" Guevara, and other key leaders of the uprising

several times hid in caves along the Sierra Maestra to regain energies and plan attacks (Forti 1998). Sensitive to this fact, the Venezuelan military, which faced its own guerrilla threat, requested cave information from the Speleology Section during the 1950s and 1960s. Long time SE and then SVE member Carlos Tinoco recalls that:

We used [our cave information archive] to plan outings and our results were added to it, with the drafts of maps, notes on access routes, etc. This was during the time of guerrillas and the military requested that we pass on to them all of this available information, because there were several incidents (such as Toro Cave in Falcón State, the Goering caves in Monagas, and in [the region of] Las Peonías in Lara) where [guerrilla fighters] were hiding and had camps [in caves]. Every time we traveled [on an excursion] we had to check in with the Ministry of Defense (in La Planicie), and there we were informed about which Operations Center [Teatro de Operaciones, or T.O.] we had to report to upon our arrival. [Tinoco, Personal Communication, May 26, 2010]

Preliminary research suggests that after the guerrilla threat was eradicated in Venezuela by the late 1960s, the military did not pursue a formal agenda of underground surveillance in the country. In a sense, it did not need to. If anyone ever stressed the importance of knowing the location of caves suitable for guerrilla activity, he or she might have realized that Venezuelan speleologists were already amassing this information. Are there any traces of cave maps in military archives? Was the National Speleological Cadastre ever considered of valuable strategic importance? These questions require further research. Yet, it appears that the initiative of systematically exploring, surveying, and cataloguing all of the caves in the country was not of interest to state cartographic or geographic institutions. Even today, the *Instituto Geográfico de Venezuela Simón Bolívar* (formerly Cartografía Nacional) has no information about the location of caves within the national territory, although it does feature thematic maps of other geological and demographic features such as rivers, mountains, and population

distribution. Geological maps produced in the early 1970s by Ministry of Mines and Hydrocarbons pinpoint general distribution and location of limestone rock, which is most prone to contain caves, but caves themselves are absent in such graphics (Menéndez 1972). In a 2008 visit to the main offices of the *Instituto Nacional de Parques* (National Institute of Parks) in Caracas, the then coordinator of geographic systems demonstrated the latest computer information system that graphically represented the country's national parks and highlighted its geographic features and boundaries. He opened the files of El Guácharo National Park, but although this park contains many caverns, the information system only marked with a point in space the entrance of Guácharo Cave.

While this question requires much closer inspection and research, I will entertain for a moment some of the reasons why in Venezuela caves did not become the crucial havens for the guerrilla that they were for their Cuban counterparts. The short answer is that they did not count with the support of an Antonio Nuñez Jiménez who could provide them with key speleological knowledge and skills that would have enabled them to effectively navigate the Venezuelan karst landscape. Yet, efforts were made. As Carlos Tinoco recalled, guerrilla fighters made some of the caverns in the karst region of Sorte, in northwestern Venezuela, a makeshift center of operations. The caves in this region, however, are hardly secret since they are widely known and visited by santeros and people who worship the cult of Maria Lionza (Perera 1988). Not only did the Venezuelan guerrilla not have any cartographic knowledge of the precise locations and sizes of other caverns in the country, neither did the Cuban guerrillas who made a clandestine entry into Venezuela in May 1967 (SVE member Miguel Angel Perera recalled that this occurred barely one week prior to a Society expedition to the coastal region of Chichiriviche, just

north of the Sorte mountains). Even if either the guerrilla nationals or Cubans had had contact and support from Venezuelan speleologists, timing worked against them: by the time these individuals planned their subversive activities, comprehensive cadastral work by the Venezuelan Speleological Society was just beginning.

In fact, Cuban speleologists did have contact with their Venezuelan counterparts beginning in the early 1950s. Recognizing Antonio Nuñez Jiménez as a pioneer in Latin American speleology and eventually, the Cuban Speleological Society as one of the premier organizations of its kind in the continent, Speleology Section founders de Bellard and Tronchoni sought formal correspondence (and presumably, recognition) from their Caribbean colleagues. Indeed, Antonio Núñez Jiménez was listed as international collaborator for both the Speleology Section and the Venezuelan Speleological Society. For de Bellard and Tronchoni, however, this liaison was a scientific and not a political one, and any efforts to meddle with this distinction was viewed as problematic. Tinoco recalls that as director of the Speleology Section, de Bellard received a package from Cuba that led to a cooling of relations between the Section and the Cuban counterparts. The package contained a copy of Antonio Núñez Jiménez's recently published *Geography of Cuba* (1954), a text that, as Tinoco described it, alarmed the conservative de Bellard. Along with the book was a letter from Antonio Núñez Jiménez requesting information on Venezuelan caves. In Tinoco's words,

this letter really caught my attention because it was written on very rough paper, like a piece of brown paper bag, perhaps this was a sign that the Cubans were starting to experience a shortage of basic goods. De Bellard became very agitated by this letter, which he quickly destroyed since he did not want to have any material evidence that could incriminate him as Cuban and guerrilla loyalist, as somehow wanted to help their cause. [Personal Communication, April 21, 2011]

Under Tronchoni's leadership, the Venezuelan Speleological Society continued its correspondence with Jiménez. The Cuban Speleological Society began to receive copies of the *Boletín de la Sociedad Venezolana de Espeleología*. This publication also featured Cuban speleological research. By then, however, the ambitions of a revolution on Venezuelan soil, using its karst as key sites of subversion, had been abandoned. Likewise on the Venezuelan side: When the Society began to work with the printing house of the Universidad Central de Venezuela, its coordinator sighed when he saw the quality of maps and the descriptions of caverns featuring in the cadastral section of the publication. "If only we had had this information when we were deep in the guerrilla..." SVE Miguel Angel Perera recalls him saying (Perera, Personal Communication, May 2, 2011).

Surveying and Accessing the Venezuelan Cavescape: Speleological Collaborations with the State

In its effort to locate and map all of the country's caverns, the SVE's cadastral project echoes the territorial ambitions of a state dedicated to the definition of its geographic domain and the identification of its resources contained therein. This ambition has not been the preoccupation solely of the state. Indeed, prior to the wave of nationalizations that sought for the state the ownership (or at least, a bigger hand in setting the conditions of administration) of its natural resources, private companies invested heavily in revealing hidden riches underground (Coronil 1997; Reig 2006/2007). With the hiring of geologists and engineers, companies such as Standard Oil's subsidiary company Creole produced a wealth of information based on their prospecting and cartographic interests and capabilities. Some of this information became invaluable for Venezuelan speleologists. Some of Creole's geological maps, produced in the 1950s, note the location

and extent of exposed limestone, the soluble rock with the greatest cave potential. During his tenure as a geology professor in the Universidad Central de Venezuela, long time SVE member Franco Urbani scanned all of the Creole maps and has made them available to the SVE, along with many of the country's geologists still doing work today.

In fact, the Society's work benefitted from other state-sponsored geological and military projects. These benefits grew from social networks among some of the group's members and individuals working in these projects, effectively blurring distinctions between the state and civil society. Urbani recalled a visit to Cartografía Nacional in the late 1960s, a time when national cartographic knowledge was still classified information. Through the personal workings of Juan Antonio Tronchoni, who befriended the institute's director Dr. Adolfo Romero, they obtained a donation of all relevant topographical maps (personal communication, September 6, 2009). To the south of the country, which features the geologically distinctive Roraima Formation, with its characteristic flat-top mountains or tepuyes, aerial reconnaissance provided important clues of where caves and large vertical pits might be located. Moreover, getting to many of these places would be virtually impossible without a helicopter or small plane.

Throughout the years the SVE managed to carry out explorations of various scales to this region thanks to the personal friendships with people working within Guayana state institutions. In the 1970s, Urbani, who studied and then taught geology in the Central University of Venezuela, was able to collaborate with old classmates such as Eugenio Szczerban and Pablo Colvee who worked for CODESUR on research of cave formation in pseudokarst located in Amazonas and Bolívar states (Szczerban and Urbani 1974). Indeed, Urbani furthered his contacts by providing geological studies of potential

sites of hydrological dam construction in the region of Caura river basin (Urbani 1977:75). Also key to several expeditions in Guayana was the personal contacts with individuals working for the Frontiers Commission who supported reconnaissance flights and transportation to several plateaus. In the mid to late 1970s SVE member Wilmer Pérez worked as a medical doctor for such a Commission, and took advantage of work along the Venezuelan-Brazilian border to scout out caves. In the heavily forested regions of Urutany, he was tipped off by the presence of nearby caves by the sounds of guacharos. Finally, friendships with individuals working for the Forestry Division of the state-run electricity company EDELCA, provided key access to helicopter flights during the 1980s. Even in the cases of aerial reconnaissance providing tips to the mouths of dark pits gaping towards the sky, cavers still had to reach these entrances, explore, and survey them on foot. In fact, many of the imposing pits of the Roraima region demanded rock climbing techniques, such as in the case of Sima Aonda with -383 meters in depth.

These examples illustrate that while speleology did not directly align itself with the state and/or capitalist territorial practices, indirectly it did benefit from them. Also through personal contacts of other SVE founding members, such as Marcos Sandoval, who worked at the *Cancillería*, the SVE gained transportation support from the *Fuerza Aérea Venezolana* to travel to the Perijá range in 1973 by helicopter (SVE 1973b). The SVE also was able to obtain aerial photographs of the Perijá region, thus defining potential exploration sites: if rivers seemingly disappeared from the surface, only to reemerge at another point, and if the area is limestone-rich, then the potential for caves was high. This was the case of the Guasare River, its subterranean portion containing a number of significant caves, all of which have since been added to the cadastre. Yet, such

aerial support was more the exception than the norm. As soon as the SVE members with these contacts dropped out of the organization, or personal connections vanished with changing jobs, then these opportunities vanished as well. Most explorations required SVE members working out who could volunteer their own cars, and making calculations of how many people and how much equipment would fit given the available vehicles. This is still a difficulty today, especially given the concern of where to leave the car, given the constant real danger of theft.

Speleological exploration in other regions of Venezuela depended on the support of individuals deeply knowledgeable of their landscape. I have already described the case of northern Monagas, where the guidance and support of expert Chaima trekkers has been fundamental for the Society's capacity to explore and survey the caves of the region.²

What these cases emphasize is the Society's own need for both geographical information and logistical support to traverse the landscape. Only by effectively maneuvering this *horizontal* traverse could they even begin their *vertical* explorations underground. This grants the national speleological project a territorial hue. It also emphasizes the complexities of speleological exploration as it attempts to traverse a landscape where various actors have staked their claim.

State and Civil Territoriality and Speleological Practice

The eagerness of some of the Society's old timers to gain visibility and even collaborate with state enterprises cooled by the late 1970s. By then, the younger generation of cavers was taking on leadership roles within the group. Several of them also identified with a

² See Chapter 1 for references to SVE studies of other regions in Venezuela where caves are actively used as sites of ritual, such as in the states of Lara, Falcón, Yaracuy, Guárico, and Zulia.

different set of political views that grew suspicious of and even rejected the state's bureaucratic and policing activities that encroached on the group's capacity to explore the national territory and survey its caves. Even Tronchoni grew increasingly pessimistic about official recognition and support of the Society's speleological endeavors. In a *Boletín* editorial he laments the difficulty of finding support to publish the work of the Society in "our country rich, generous, and splendid, receptive to all kinds of innovation, idea or modality, regardless of how frivolous or costly it may be" (Tronchoni 1969:3). To him, this lack of support was doubly frustrating because it spoke to the misguided morality of the national society as a whole that did not value "the patient and steady work of a group of young men, most of them university students, dedicated team members, without desires of personal aggrandizement and dedicated to the work of exploration, research, and promotion of our vast underground world" (Tronchoni 1969:3).

Not only was the Society unable to gain the official recognition and support for its work, it increasingly had to navigate the bureaucracies of INPARQUES, the National Institute of Parks. On the one hand, the creation of this institute was celebrated as evidence of the governments' commitment to the creation and conservation of national parks. On the other, it was cursed for the circuitous paths it set in order to receive permits for research in its administered territories.

As the case of the 2004 Roraima expedition illustrates, having a permit in hand hardly was a guarantee of its validity and effectiveness. Herrera's commitment to follow the rules and the frustration when his efforts backfired must be understood in contrast to other Society members who in the past have scoffed at the need to get permits at all. Indeed, the group has repeatedly carried out expeditions in the El Guácharo National Park

or the region of Perijá under the radar of state bureaucracies. To Herrera this reflects the arrogance and iconoclasm that has sometimes characterized the group, or at least some of its key members who, in his words, “imposed their leadership with their personalities.” “It is like the people who drive along the service lane of highways [something that is very common in Venezuela] to get ahead ... that attitude that you are above the state ... there has been a lot of this in the group,” he opined (Herrera, Personal Communication, August 12, 2011). He is not alone to make this assessment. I read both positions towards state bureaucracies as idealizations of the proper relation between civilians and the state. More specifically, these idealizations concern civilians’ capacity to set the terms of their own engagements with the landscape, regardless of state territorial claims on it. Again, these dynamics emphasize the broader *political* geographies of speleological practice beyond the caves themselves. In order to get *in* caves, one has to move *across* the territory to get to them.

Of course, the state is not the only actor to place limits on the Society’s capacity to traverse the landscape in search for caves. Private owners who have on their land, sometimes without their knowledge, entrance to caverns effectively own the entrance if not the cave itself. Other times small rural communities act as the guardians of nearby caverns. In these cases, the strategy that the Society has opted to pursue is one based on transparency, communication, and sometimes collaboration.

For some of the newer members of the Society, these terms of engagement are a source of optimism for the future of speleological practice, and perhaps even, Venezuela. Such was the perception I got from Maribel Ramos. “We have been thinking about you a

lot, we wish you were here," Maribel told me on the phone just a week prior to Holy Week 2011. "The Society is entering a new phase," she continued enthusiastically. During the last few expeditions, one to Sucre and the other to Monagas state, the group established a unique relationship with the communities living in the vicinity of the caverns explored and surveyed. In the town of Fuente de Lourdes (Sucre) seven people from the community joined them into the cave, with some eager to learn how to survey. People's homes were offered for the night. In the town of Río Chiquitico (Monagas) they were invited out to eat at a local restaurant. The leaders of the community asked the cavers to give talks about speleology. "We gave them information about their cave, and emphasized it was theirs to conserve, and, in the case of Río Chiquitico, perhaps even use to attract tourists," Maribel continued. To Maribel, speleological knowledge should not be limited to the scientific agenda of the Society, but should be made useful to those who live on or near karst.

A few others in the Society's history have shared this sentiment, most notably Juan Antonio Tronchoni. He envisioned a speleological institute in Caracas that would house both the SVE and a speleological museum open to the public. He purchased a piece of land in the town of Caripe with the idea of building a regional speleological center. Neither of these ideas ever materialized. He was both doer and promoter of speleological education, particularly in schools. This, he believed, would get youth excited about caves and science in general. Such efforts would also help recruit new Society members, ensuring the national speleological project's longevity and growth. Even more critically, caves would be better understood as critical geological and ecological spaces, many of them connected to some of the country's aquifers, and perhaps even appreciated and

conserved. In these ways as well, members of the Venezuelan Speleological Society have imagined alternative relations between civilians and national geographies, relations that circumvent the state altogether and instead seek the growth and participation of the public sphere (Habermas, Lennox, and Lennox 1974) in the recognition, management, and responsibility towards the nation's nature.

A Broader Geopolitics of Speleology

Unlike many ordinary places, territories require constant effort to establish and maintain. They are the result of strategies to affect, influence, and control people, phenomena, and relationships. Circumscribing things in space, or on a map, as when a geographer delimits an area to illustrate where corn is grown, or where industry is concentrated, identifies places, areas, or regions in an ordinary sense, but does not by itself create a territory. This delimitation becomes a territory only when its boundaries are used to affect behavior by controlling access. [Sack 1986:19]

On the one hand, the cadastral project, whereby caves are located, explored, surveyed, and mapped merely circumscribes and delimits, not an area, but a volume underground. In no way does this action lead to a claim of ownership and authority over its existence and content. In this sense, the Society's cartographic efforts are not territorial, according to Sack's definition (1986:19). On the other, there are ways in which these efforts *do* gain a territorial tinge. Appreciating this fact requires understanding the broader geopolitics of speleology.

In his welcome message to the 15th International Congress of Speleology, UIS president Andy Eavis remarks that

Cave exploration is now going on all over the globe, with many new areas being visited. Suggestions 30 years ago that there were no caves in the Himalayas have long since been superseded. Africa and South America are new frontiers with relatively small numbers of caves so far explored. [...] Probably no more than ten percent of the caves in the world have

been explored and only a fraction of the potential cave science accomplished. [Eavis 2009]

Through this optic, the caves that to state or capitalist enterprises might hold no immediate appeal, suddenly become very attractive. For those seeking unexplored or “virgin” passages, a “resource” harder to come by in countries with longer speleological traditions, Africa, South America, and Asia hold extraordinary promise of discovery. Moreover, as SVE member Rafael Carreño notes in a essay on speleological sovereignty, these regions’ underground spaces are also teeming with unidentified species and minerals (Carreño 2004). What to those with no speleological sensibility might just be empty voids, for others they are a treasure waiting to be tapped and even, exploited.

At this International Congress, held in Texas in July 2009, over 1,500 cavers from over 50 countries exchanged reports and images of their latest exploratory and scientific accomplishments. Most of them practice caving as a hobby through affiliations with their local or regional caving clubs. Few (although this number is increasing) have been able to incorporate caving into their careers, such as the case of geologists, hydrologists, and biologists who have specialized in speleological research, despite the fact that speleology has failed to claim its place as an academic science within most universities and research centers worldwide. In virtually all cases, cavers themselves manage the speleological data they themselves produce, mostly of a particular region of the country in which they reside, although a smaller number travel abroad to explore and map caves at international sites. Precisely under what conditions international caving efforts take place and what happens to the resulting speleological data are topics that have been and continue to be debated among cavers. In 1997, at the 12th International Congress of Speleology, the UIS General Assembly approved the "UIS Code of Ethics for Cave Exploration and Science

in Foreign Countries," with subsequent amendments made in the following international congress in Brazil in 2001. These amendments reflect a preoccupation, particularly from cavers of "countries of lower speleological development" to hold UIS Bureau Members and National Delegates more accountable for the activities of their caving community from "countries of high speleological development." The amendments also call for a reduction of this gap of "speleological development" among nations. Point 5.c. reads: "For expeditions organized by countries of high speleological development to countries of lower speleological development, the expedition group shall do its best to offer the transfer of knowledge and to promote local speleological activity" (UIS 2009).

Five years later, at the 14th International Congress of Speleology, tensions ran high regarding several presumed violations of the UIS Code of Ethics. One of the debates involved Venezuela, whose national speleological organization, the Sociedad Venezolana de Espeleología (SVE), argued that cavers from Slovakia and the Czech Republic had violated the Code of Ethics with their expedition to and resulting publications of a cave located within the quartzite walls of Roraima Plateau (SVE 2005; Urbani 2006). As of this writing, this issue has not been resolved. This ongoing debate reflects the concern among many that, with its Code of Ethics, the UIS only makes a recommendation of proper practice. There is no structure set up to hold presumed violators accountable for their actions.

Beyond the specifics of the Roraima Sur Cave lies a broader and familiar pattern that questions the barrier-less global imaginary that UIS President Eavis evokes in his message above. Resource differentials (whether in the form of personal wealth, state support, or access to private exploration and research funds) grants some cavers greater

capacity to travel to less explored regions of the world to carry out exploration, in some cases creating geographies of power that echo a not so distant colonial past. Access (or lack thereof) to passports and visas also hinder or promote (depending on perspective) caver mobility and activity. There is nothing new about this. Cavers everywhere recognize these facts. It is precisely the efforts of organizations such as the UIS to promote ethical (or at minimum, more transparent) practices everywhere. Indeed, it is not just speleological projects that are at stake: so too are communities whose livelihoods are linked in some way to cave ecologies and their surroundings, as well as the conservation of caves themselves.

There are, however, problems with the terms these debates are cast. The cases of caving societies that cohesively and undisputedly represent the speleological efforts of an entire country are few and far between. More typical is the case of several (or many) regional clubs, sometimes loosely organized into a national federation. Efforts to create a national caving society often splinter into more numerous groups, with seemingly irreconcilable differences left in their wake. Sarah Cant's analysis of British speleology is a case in point (2006). Some cavers go solo, preferring no affiliation with any one association, as is in fact the case with a number of Venezuelans who collaborated with the Czech and Slovak societies that the SVE accuses of ethics violations. While the UIS formally works in terms of national delegates and representations, this structure rarely reflects the reality of national speleologies within their home turfs. This fact, in turn, complicates the division of the world into countries of greater and lesser "speleological development." Implicit in these terms is the idea that a caver has a greater right to the caves of his country than a foreigner does. Yet, such territorial claim belies what is

typically a complicated national landscape, with caver nationals themselves sometimes echoing the very inequalities within their countries that they decry at the international scale. Statements defending the so-called "speleological patrimony" can read as intensely parochial, often assuming a national unity that is questioned by nationals and foreigners alike (e.g., Carreño 2004).

Elsewhere I have pointed to some of these inner tensions. The very birth of the Venezuelan Speleological Society was in part the result of the desire to create a space for an alternative model of speleological practice, both within Venezuela and beyond. The debates leading to the definition of the Speleological Cadastre of Venezuela, with its inclusions and exclusions, highlight some of the politics of defining Venezuela's speleological knowledge. Yet, as I have also addressed, these dynamics cannot be understood without regard for speleology as a broader transnational phenomenon. With many speleological groups receiving no formal recognition within academic or state institutions within their own home countries, they turn to each other, beyond national borders, to validate, debate, and support their efforts. Yet, even in this transnational arena, national and regional identities do not disappear, but become reasserted. Indeed, some members of the Venezuelan Speleological Society have led the initiative of creating a Latin American and Caribbean speleological federation.³ Through this organization, the SVE has sought to position itself as a speleological regional player, strengthening its

³ One of the stated goals of producing the *Boletín de la Sociedad Venezolana de Espeleología* was to create a venue for the publication of regional (Latin American and Caribbean) speleology. Breaching this commitment sparked debates within the group about its stated goals as a regional speleological organization. In the spirit of establishing the group's regional influence, SVE member Carlos Bordón's road trip through Latin America in the 1970s was viewed as a success in terms of speleological diplomacy. Together with his wife Nora, Bordón sought caves and cavers in most countries in the continent. These efforts resulted in some long-lasting correspondence.

voice with the support and numbers of its neighbors, while at the same time underscoring its identity at home as *the* national speleological group.

Conclusion

Anthropologist Nancy Peluso was among the first scholars to theorize the impacts of indigenous communities' attempts to assert their claim to their lands by appropriating some of the very cartographic strategies that states use to claim theirs (1995). These indigenous maps, or "counter-maps," become effective tools to challenge the hegemony of typically oppressive states. Similarly, the Venezuelan Speleological Society, with its management of the national cadastral project, has been carrying out, for over 50 years, cartographic activities typically associated with state territorial efforts. Unlike the Indonesian counter-mappers in a fight to lay claim to their forest resources, Society members are not trying to claim caves as their own, away from the grips of a policing state. On the contrary, shortly after its foundation, the group sought recognition and visibility from government officials. The Society aimed to place caves along side other important natural resources, as an important part of Venezuela's subterranean heritage. Their attempts have had little, if any, success.

This earlier attempts for official recognition and support gave way, by the late 1970s, to a growing suspicion and rejection of state bureaucracies and policing strategies that hindered the SVE members' desire to explore the national landscape, survey, and map caverns.

At the same time, the SVE continued to publish its journal, which included the National Speleological Cadastre. Thus, a state official bent on punishing the group's

territorial transgressions or even appropriating its speleological registry for some future use (a future skirmish with yet another guerrilla movement?), need only to seek out this information. Yet, to not publish, to not make public the results of its explorations would threaten the Venezuelan Speleological Society's *raison d'être*. So far, it has benefitted from staying, sometimes literally, under the radar.

Coronil has argued that a defining characteristic of Venezuela's political culture is the view and experience of the nation as constituted by two bodies, "a political body made up of its citizens and a natural body made up of its rich subsoil" and that "[b]y condensing within itself the multiple powers dispersed throughout the nation's two bodies, the state appeared as a single agent endowed with the magical power to remake the nation" (1997:4). I see the speleological cartographic project as an odd case challenging this national anatomy, itself taking up the tools and even some of the ideologies of state cartographic projects and refashioning them to suit its actors' determination to traverse the national landscape, immerse themselves within its hidden crevasses, and produce representations of these spaces, these representations then circulated mostly among an international speleological audience. As such, these practices weave together an alternative cartography, emphasizing not territorial boundaries nor property, but the sociality and movement that the engagement with a peculiar kind of landscape invites, challenges, and engenders.

Chapter 8

Conclusions

During my time in Venezuela, Oscar Garbisu, my father's companion during the 30-day stay in Guácharo Cave, gave me a wonderful gift. As staff of the Cinemateca de la Biblioteca Nacional (the Film Archive of Venezuela's National Library), he located and reproduced for me a copy of a national news cast of that extraordinary event back in 1967. The short clip was played, alongside other national news, in movie theaters all over the country as a preview to feature films.¹ It contains a number of limited views inside of the cave, mostly focused on salient formations. At one point the camera's attention turns to the young speleologists. With an authoritative voice edging on the melodramatic, the narrator declares them the future promise of Venezuelan science, celebrating their efforts in revealing to the country the majesty of its underground natural patrimony.

This clip was valuable evidence of the Venezuelan Speleological Society's early efforts to publicize its work to the broader public. The hope was that such publicity would garner financial support from both public and private sectors. It also reflected the desire to raise public awareness of, and even participation in *national* speleology. Moreover, the film illustrates the difficulty of visually capturing precisely what is so valuable or majestic about the underground. Most shots are confusing contrasts between light and dark, with the silhouettes of stalagmites and stalactites attempting to anchor the

¹ Bolívar Films produced the clip.

viewer onto some recognizable image. Understood in the context of the history of the Society, the clip offers fascinating evidence regarding the changing views of newer members vis-à-vis their “elders” and other speleological “pioneers.” As I have explained at different points in this work, the foundation of the Venezuelan Speleological Society was partly premised on the rejection of an individualistic and bombastic speleology. Such a speleology was not only deemed unscientific, it also was rejected as elitist, sensationalist, and even, imperialistic. While Society members recognized the importance of garnering public support, many (including my father) found the clip over-the-top. Nothing quite like it was ever repeated in the history of the Society.²

Yes, on all of these counts this clip was an extraordinary piece of evidence. But it also was a gift imbued with personal significance that I now treasure along with photographs, newspaper clippings, and recorded interviews that make up the bulk of the data for this project. The same is true of every single volume of the Venezuelan Speleology Society’s *Boletín* that is now part of my home library. These objects are personally significant for three reasons. First, they are material clues that help me reconstruct bonds of relatedness that were so important in my father’s life and eventually, my own. Second, these objects reveal a peculiar geography of my home country, which I left behind at 15 and I yearn “to know” better. Third, through their exchange and my

² This is not to say that the Society completely gave up publicizing its work. However, these efforts always brought with them lively discussions among the members, and at times, even accusations that some were trying to gain individual fame on the backs of the Society by participating in one project or other.

attempt at understanding and reading them, I have forged new relations of my own, to people, the landscape, and their interrelated histories.³

These reflections on objects gathered through my research extend to spaces as well: to the Society's small headquarters in the basement of a residential building in the Caracas, people's homes, hiking along the Venezuelan karst landscape and dipping—cautiously, excitedly—into its caverns. Objects and space come together most powerfully in cave maps. In the stories I tell, I have stressed the collective, poetic, and dialectic qualities of these maps, both in their production and their reading. In doing so, I have proposed opening up the geographies of science by focusing on the relational, affective, and experiential qualities of scientific practice. For the Venezuelan speleologists I have featured here, so much of their science is about exploring extraordinary spaces with others. These experiences often forge new or strengthen preexisting bonds of relatedness. Yet, what happens in the caves, in the field, or even in the group's headquarters is not enough to appreciate the work and commitment necessary to maintain the speleological project through time. Juan Antonio Tronchoni understood this, and for this reason he stressed the need to foster camaraderie, whether in restaurants or members' homes, including his own.

Analyses of dynamics between prescribed spaces of science (e.g., laboratories, the field, conference halls, etc.) and other spaces (e.g., homes, bars, golf courses, etc.), has two important implications on the academic study of science. First, it shifts attention to spaces where new collaborations and even ideas are forged and created that then travel

³ That these objects also are evidence for my work does not make them any less personally significant. If anything, they make them more so, as they help me develop a project that has kept me busy for so long, often far from my home.

back to laboratories and field sites.⁴ Analyzing these dynamics (including *how* this traveling of relations and ideas occurs) might help us understand how and why people come together to start and maintain new scientific endeavors through time. I suspect that such analyses would suggest that people's capacity to navigate different spatial domains to spark and build new relationships of friendship and trust actually further scientific practice. Second, opening up the geographies of science might help us learn how scientific practice, the places where it takes place, and the knowledge it produces might become meaningful to scientists and others' lives. Both of these implications add a relational and affective aspect to the already studied normative and moral dimensions of science (e.g., Latour 1989, 1999; Leigh Star and Greisemer 1999[1989]; Shapin 1998). Some of these dimensions might be entangled. All three are in the case of the production of the Speleological Cadastre of Venezuela I describe in Chapter 3.

From an anthropological perspective, exploring these spatial, material, and affective dynamics of relatedness broadens our appreciation of where, how, and why these relations come into being beyond the more traditional domestic "sites" of kinship, such as homes (e.g., Bahloul 1996; Carsten 1995; Mueggler 2001; Smith 2009:8-9). Some anthropologists have examined kin relations in the context of work (e.g., most recently Smith 2009 among miners in Wyoming; Yanagisako 2002 among Italian family firms). In my work, I emphasize the blurring of and dynamics between spatial domains as

⁴ This proposal was inspired in part, by my own husband, who works in a laboratory at the Physiology Department of the University of Iowa. Both at home and in the car we keep pens and notepads that come in handy whenever a "work" idea pops up and must be scribbled down. If this happens at home, he detaches the piece of paper and puts it on the table near our door, next to the keys. If we happen to be out and about, he puts the piece of paper in his pocket, and *then* put places it next to his keys once we get home. Either way, he never misses taking it back to the lab the next day of work.

these relations are strengthened and forged. In my case, these relations, this spatial blurring, is not the “behind the scenes of science” that some geographers have explored, but critical to the production of science itself (Lorimer and Spedding 2005).

Despite speleology’s and indeed—the Society’s—emphasis on cave *science*, I have strived to present the cave landscape as a distinctly polyvalent space, both as spaces of exploration and represented spaces. The cave landscape’s intense symbolic and material qualities come into being as human bodies traverse its underground passages (Eliade 1962; Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990; Shortland 1994; Williams 2008). Caverns are not spaces of dwelling or habitual practices. Thus, my case study calls on theorizations of space that consider intense human encounters with *newness*. By considering caverns as spaces of exploration, as objects of science, this study also has broadened the range of human-cave relations (Bonsall and Tolan-Smith 1997; Brady and Pruffer 2005). In doing so it hopes to be of use to cave archaeologists interested in enriching their appreciation of potential uses and meanings of caves. In the context of Venezuela, this also has meant considering speleological activities alongside and in relation to other cultural (indigenous, folk) practices that center around caves (Perera 1988).

And yet, as extraordinary as these spaces are, I have stressed thinking of them, of the unique experiential qualities they engender, in dialectic with their representations, and even, other spaces that help make their exploration possible. I return to this topic below as I reflect on my own positionality vis-à-vis my object of study.

In the context of Venezuelan anthropology, this project makes a number of important contributions. By taking mostly urbanite and culturally elite speleologists as its

main focus, the project goes beyond the more traditional indigenous ethnographic subjects. On this front I build on important works that also “study up” such as Fernando Coronil’s analysis of the political and economic elite in *The Magical State* (1997) (Boyer and Lomnitz 2005; Nader 1969).

The present project engages the topics of nature and history that have been critical in providing novel analyses of both state-sponsored and popular discourses of nationalism (Altez 2006; Coronil 1997; Cunil Grau 2007; Reig 2006/2007). This study also contributes with efforts to uncover a broader perspective on history that goes beyond (and may even challenge) state-sponsored official histories, a salient theme in recent Venezuelan anthropology (Altez 2006; Arvelo-Jiménez 1990, 2000; Hill 2000; Coronil 1997; Pérez 2000; Reig 2006/2007). This topic is particularly relevant in the broader context of Latin America. During the years leading up to and succeeding the Columbian quincentenary, Latin America has been at the vanguard of social movements that have challenged the conception and practices of the nation-state (de la Peña 2005; Escobar 2001; Jackson and Warren 2005; Mignolo 2005; Warren and Jackson 2002). The redefinition of cultural (including national) identities, nature, and even the juridical concepts of patrimony and ownership has been a fundamental part of these challenges.

The study of speleology adds an ethnographic case study of scientific practice that also is novel within Venezuelan studies of science. While Texera Arnal has produced valuable social histories of Venezuelan ornithology and zoology, neither follows practitioners to the field (2002, 2003). Moreover, both cases involve “academic” disciplines, although her analyses do stress the contributions of amateur enthusiasts in their promotion prior to their formalization as disciplines. With my emphasis on opening

up the geographies of science and exploring their dynamics and intimacies, I hope to question some of the characterizations of scientific practice as either “of the field” or “of the lab” or even “of academia.” I also take up the idea that “the 'scientification' of society, on the one hand, and the politicization of science, on the other” as one of the main characteristics of Latin American science during the last 100 years (Saldaña 2006:161). In contrast, the activities of the SVE buck this trend, opening up a space for “civic science” (Withers and Finnegan 2003). What other examples such as this might there exist both in Venezuelan and in other Latin American countries? Finding out could reveal a previously unexplored dimension of civil society on the one hand, and experiences and imaginings of the nation on the other.

As I already have noted, this study joins efforts in challenging monolithic imperial and colonial histories by focusing on the particular experiences of explorers (Burnett 2000). In the case of explorers in Venezuelan territory, scholars such as Burnett and Raffles have made critical contributions (Burnett 2000; Raffles 2002; see also Vessuri 1999). Yet, this project tests these studies insights in a different context, since its protagonists are neither formal imperial nor colonial subjects charged with advancing political goals in lands other than their own.

Despite these contributions, this dissertation also poses new questions that deserve further research. Chapter 6 already notes the need to investigate the indigenous baquianos’ perspective on the speleological project. Chapter 7’s tentative conclusions regarding the relationship between speleological practice and the Venezuelan state beg further analysis in relation to the radical political transformations in the recent years. Omitting an analysis of gender relations among speleologists, even if the number of

women as members of the Venezuelan Speleological Society typically has been small, is a limit of this study. The very fact that few Society members have been women begs further analysis. Finally, how might this study help rewrite a world history of speleology? For now, I want to consider some of the ways an anthropological study of speleological practice resonates with ethnographic inquiry more generally.

Adventures in Caving, Adventures in Anthropology

There is immense satisfaction in going not just where no human being has ever gone before, but where — if there *is* any meaning in it — no human being was ever meant to be. — Richard Watson, *On Caving*

Here I want to recall my two experiences leading the exploration of unsurveyed passages. Chapter 4 opens with the account of my claustrophobia in Roraima Sur Cave. Chapter 6 narrates my descent into *El Alto de la Palencia Sima 3* where a fear of snakes cut my aspirations of discovery short. These two experiences contrast with two other memorable cave moments. During a cave surveying course at Mammoth Cave in 2003, my instructor suggested I make my way along a side passage, away from the group, to urinate. "It is so dry here, whatever you leave behind will evaporate quickly," she explained. "Just make sure you do it off to the side — we are on tourist trail." And off I went, with my headlamp piercing the darkness. I had already been underground for about three hours and had felt completely comfortable, but this was the first time I trekked along completely alone. Fear held me back, but the darkness ahead also beckoned. *How far am I willing to go?* I taunted myself. I pushed myself to walk up the passage a little further, heart pounding. I opened my cave overalls, turned off my light, and urinated in absolute darkness. Walking

back to the group, I felt like the dark behind me weighing on my back, as if it wanted to embrace me, or swallow me whole.

Just a few days before, the mood in a dark and much tighter corner of Mammoth Cave was very different. As our geology instructor spoke about the layering of sedimentary rock, I put my pencil and notepad down and relaxed my body on the cool rock bearing my weight. I turned to look up at the rock above me, only a few feet above my face. Thoughts of being suddenly sandwiched between the Ste. Genevieve and Girkin formations gave way to a feeling of calmness, of protection. The smell of dampness and mud overwhelmed me, the voice of my instructor filling the void, coming from nowhere in particular. I closed my eyes, and focused on nothing but *being* there. Being *there*.

During my dissertation research, I have been collecting descriptions like these, all of them highlighting the sometimes bizarre and often surprising experience of going underground. I have been saving these descriptions, doubting they would make their way into my thesis. Yet, I came to think of my self-censoring as an invitation to reflect on the practice, history, and politics of anthropology.

One of my Venezuelan informants admitted that one of the reasons he loves caving was that exhilarating feeling of crawling down a passage that just might lead to a large and beautifully decorated room. He loves the appeal of discovery, which, he quickly acknowledged with a sheepish smile, smacks of imperial fantasies. Cave explorers often cite this draw of discovery, of stepping into uncharted spaces, as a strong motivation for what they do. What to make of this? No anthropological analysis would be complete without deconstructing a claim of discovery, which a postcolonial critique has repeatedly revealed as an imperial impulse characteristic of a Euro-centered paradigm of both

symbolically and materially appropriating nature (e.g., Mignolo 2005; Pratt 1992). More often than not, claims of discovery are acts of erasure, of complete disregard and even overt destruction of alternative systems of knowledge. We should be suspicious of claims of discovery. What motivates them? What differentials of power do they conceal?

Moreover, a critical analysis of cave exploration and mapping cannot miss considering the activity as a part of the rise and commodification of travel. The appeal of adventure, in particular, gained purchase within the context of European imperial expansion, and, more recently, “adventure travel” has become popular within “a system of global capitalism that makes it possible for a small segment of the world’s population to have the resources to journey afield in order to have ludic adventures” (Gordon 2006:20). I have already noted E. A. Martel’s efforts to win over converts from mountaineering to this new “sport-science” by claiming that unlike the popular and well-trodden alpine peaks, an entire world awaited exploration and discovery underground (Cant 2003:70). Moreover, caves were (and still are) the last pristine frontier, spaces befit for the challenges of true Adventurers, spaces where they can either discover or augment their decidedly male heroic persona. Or are they?

In *Tarzan was an Eco-Tourist...and Other Tales in the Anthropology of Adventure* (2006), a number of scholars critically examine the experience and trope of adventure from an anthropological and historical perspective. Contributors take Georg Simmel’s writings on the topic as a starting point. In his 1911 short essay “The Adventure,” Simmel posits that

[w]e are the adventurers of the earth; our life is crossed everywhere by the tensions which mark adventure. But only when these tensions have become so violent that they gain mastery over the material through which they realize themselves – only then does the 'adventure' arise. For the

adventure does not consist in a substance which is won or lost, enjoyed or endured: to all this we have access in other forms of life as well. Rather, it is the radicalness through which it becomes perceptible as a life tension, as the rubato of the life process, independent of its materials and their differences – the quantity of these tensions becoming great enough to tear life, beyond those materials, completely out of itself: this is what transforms mere experience into adventure. [Simmel 1997:232]

As David Stoll suggests, one problem with this definition is that it characterizes adventure as accident, as calamity, while he and the other contributors to the volume stress adventure as “a deliberate undertaking that requires conscious choice and awareness of risk” (2006:271). Other contributors characterize adventure as a form of modernity that has gained purchase in the context of global transformations such as the commodification of travel (Yengoyan 2006:28). Precisely because of such associations, I chose the less charged term *exploration* to emphasize the kinds of intimate and intense engagements in/with place that often (always?) characterize cave traverses. In Chapter 6 I present Venezuelan speleologists’ accounts and interpretations of indigenous baquianos also *exploring*. Their perspective (which I am inclined to believe) echoes Steven Rubenstein’s argument, based on his ethnography of the Shuar Indians of the Ecuadorian Amazon, that adventure is *not* solely an expression of modern Western culture (2006:236).⁵

I also have pointed to Sarah Cant’s analysis of the leisure pursuit of caving, arguing that to some cavers, their relationship with caves’ peculiar spaces can be best described as sensual, intimate (2003:69). But as she argues, “these ideas of intimacy may disrupt ideas of ‘toughness’” that in turn challenge the notion of adventure as cast within

⁵ In the same volume Yengoyan highlights the work of Nerlich (1987) who argues that while “adventure itself is an epic of modernity, adventure has its roots in a period in European thought and history that was precapitalistic and also premodern” (Yengoyan 2006:28).

the frame of male heroics, or, as Simmel suggests, adventure's conquering gesture (Cant 2003:69; Simmel 1997). Challenging conventional stereotypes of the macho adventurer set out to discover and appropriate nature, Cant's attention to individual caver subjectivities reveals a more subtle notion of exploration, one that is closer to another aspect of the experience of adventure, per Simmel, who actually considered adventure's "gesture of conquest" in *dialectical* tension with "complete self-abandonment to the powers and accidents of the world, which can delight us, but in the same breath can also destroy us" (1997).

Closer... but different. Simmel's conceptual pendulum swings from conquest to a passivity courting death, all the while staying within the confines of the accidental, the calamitous. Moving along cave passages, spaces that are as varied as they are dark, the body is not so much challenged (although certain spots surely earn this characterization) as it is invited along in a cautious negotiation with stone. Moreover, in the process of cave mapping, this movement takes on a collective rhythm, challenging the paradigm of the lone explorer/discoverer. As I have suggested, some passages are so delicately decorated that a caver readjusts his bodily position so as to move along without causing damage. Some spots he avoids altogether and may even attempt to physically conceal so as to keep it from view from future visitors with different sensibilities. The risk of damage is too great. In a move that contradicts the performative quality of Exploration as performance, the revealing imperative of Science, the decision to keep great discoveries secret is common among many cave explorers all over the world.

Intimacy, concealment, sensuality. These are attributes not typically associated with the stereotypical construction of modern adventure, much less of cartographic

projects. Even the draw of discovery is not ubiquitous, at least not if framed within the paradigm of Western science. In 2007 I had the opportunity of visiting the non-touristic sector of Guácharo Cave, along with fellow SVE member Maribel Ramos, and two Australian cavers visiting the country.⁶ This was the first time any of us had been in this cavern. Did it matter that it already had been explored and surveyed? Did this preclude each of our personal sense of exploration and discovery, even while accompanied by an experienced cave guide? Not entirely. Traversing this cave's passages was still a novel experience to each of us. At times crawling, climbing, and even swimming, this sense of novelty heightened by ignoring the map I carried in my backpack, and allowing instead the cavern to unfold in rhythm with our bodily efforts, and the always limited reach of our lights.

Whether a deep, subconscious connection that stirs our common humanity is responsible for the intensity of human experience underground is something many scholars have examined (Eliade 1962; Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990). While it might be impossible to provide conclusive evidence for such proposition, physically traversing cave passages is unlike any quotidian human experience *anywhere*. Taking this fact seriously, along with cave explorers' motivations for why they do what they do, has been an important point in my work. I have sought out alternative interpretations by thinking of *discovery* as a process of unfolding, of becoming, as opposed to the *a-ha!* moment of science, itself more fiction than fact. A space of alternative interpretations reveals itself even further when thinking of cave

⁶ Ramos, among the younger and most recent members to join the SVE, was thrilled with this chance. "All serious Venezuelan speleologists *know* Guácharo Cave... How could I not?" she half-joked.

explorers' experiences as intensely embodied practices, their bodily, affective, and cognitive capacities the results of a long evolutionary and cultural history. These embodied practices, of course, cannot be considered separate from the peculiar spaces of caves themselves, their shadowy and sinuous inner worlds a radical departure from the rectilinear spaces of the built environment, or even the paths along which we trek out in so-called nature.

My conclusions, even when tentative, derive not just from exploration narratives and interviews, but also from going along on not one but many treks underground. As an ethnographer, I have sought to go where people are (or in this case, *go*), and, to the extent that it is possible, share in whatever they are doing (Fricke 2004). It is from this epistemological and methodological impetus that ethnographers derive their authority, their claim on authentic and meaningful insights on the human condition. This being the case, as ethnographer I am not exempt from the intensely embodied experiences and imaginings that I have attempted to describe of my informants. This has implications on the representations I produce, this time in the form of ethnographic knowledge.

In his book *Devil's Book of Culture* (2003), anthropologist Benjamin Feinberg features a picture of himself squeezing into a cave, the upper part of his body gobbled up by stone. The caption reads: "The author searches for culture inside the Sierra Mazateca" (2003:227). Cave exploration as metaphor of the ethnographic inquiry, as immersion into a culture. Anthropologist Stefan Helmreich expands on the metaphorical and explicit associations between ethnographic inquiry and "immersion" in the field, as he joins a crew of oceanographers in a dive to the seafloor (2007). He notes:

In what I initially imagine to be an idle pun, graduate students on *Atlantis* have joked that I will now truly "immerse" myself in the culture of deep-

sea oceanographers, seeing their preferred medium with my own anthropological eyes. [2007:621]

Helmreich both sympathizes with and criticizes the immersion-into-the-cultural-medium metaphor, cautioning against the sense that immersion somehow automatically, passively, grants knowledge, insight, and in the case of ethnographic writing, an aura of authority, of being in the present, being *there*. He suggests we think not of immersion but of transduction, and the possibilities that a transductive ethnography might afford:

an inquiry motivated not by the visual rhetoric of individual self-reflection and self-correcting perspectivalism, but one animated by an auditorily inspired attention to the modulating relations that produce insides and outsides, subjects and objects, sensation and sense data. [Helmreich 2007:622]

In caves, Helmreich's proposal extends from the focus on audition to that of all senses, as he himself suggests in a footnote. But recalling Eshleman (2003), our entry into caves as ethnographers just might do more than stir the senses. I have noted some speleologists' imaginings regarding their encounters in the Venezuelan karst. I have not been exempt from imagining myself: Muscles on the move, joints aching, rock all around us, the imagination soars, impossible not to think of myself (and, by extension, fellow cavers around me), as part of a long evolutionary lineage that has been captivated by spaces such as these in the past. It is not even necessary to plunge down such long evolutionary scale... our own developmental paths began with our own coming out of dark and embracing spaces, as psychologist Carl Jung and historian of religion Mircea Eliade remind us. Our the first years of our own lives were marked by an extreme sense of curiosity, a need to explore, first on our bellies, then on hands and knees and onwards. One need not even leave one's home to rekindle our fascinating with exploration and the imaginings it inspires (Bachelard 1994[1958]).

All fieldwork experience—that extraordinary privilege!—is marked by moments of curiosity, wonder, excitement, fear. Our senses are overwhelmed. Imagination soars. In this light it is not a stretch to think of ourselves akin to the cave explorer drawn to discover (no, not "discover," but *discover*). What happens with these experiences as we return from the field, as we begin the process of writing up? Do they get deleted, edited out, lest our professors and/or colleagues confuse our ethnographic writing for a travelogue? This is precisely the kind of editing that the professionalization of anthropology has depended on (Fabian 2000). Concerned about the “imminent danger of disembodied postcolonial theorizing,” Fabian contends that “[e]cstasis, in a nontrivial understanding of the term, is (much like subjectivity) a prerequisite for, rather than an impediment to, the production of ethnographic knowledge” (2000:xiii-xiv;8). In his essay on adventures in mountaineering, David Houston echoes Fabian’s point:

Anthropologists set out to study from a distance those whom we are not ... we maintain our "distance" and our claim to an anthropological core. At the margins of experience, however, this equation is more difficult. Here, we define the adventurer as "Other." ... Is what we do so different from the adventurer? ... Adventure presents us with a challenge to our own denied "nativeness." If we deny a part of us that wears adventure like a well-fitted suit, we risk becoming the object of our own study, our own "other." [Houston 2006:159]

As I ponder on alternative ways of interpreting and understanding cave explorers' motivations for what they do, and my own growing obsession with the spaces that captivate their draw for exploration and wonder, Fabian's suggestion to both acknowledge and embrace the ecstatic appeals to me, as does Helmreich's suggestion of a transductive ethnography. They acknowledge the sensory, the experiential, in that which we do, where we do it, and with whom. Reading Helmreich's ethnographic account of submersion deep within the ocean, I sensed, as I did with Eshleman, an attempt to capture

and validate a sense of wonder, of curiosity, and even joy in the possibilities of exploration and even adventure afforded to us through fieldwork, and even the process of writing.⁷ Recalling those moments both within and beyond caves, I begin to imagine them as new leads to explore—cave passages and flickering shadows a perfect simile to the process of knowing, of imagining, of being human, past, present, and future.

Coda: Guácharo Cave Opens Up

I finally visited Wilmer and Oscar's 1967 Guácharo Cave campsite in March 2008. This was during a tour of the non-touristic sector of the cavern lead by expert guide Benito. Aside from Maribel and myself, two Australian cavers, Julia James and Alan Warild, whom I had met at an international speleology congress, joined us.

The day before our scheduled cave entry, I contacted a reliable taxi driver and friend of the Salazars, my Caripe host family. He showed up at 3:30am, smiling, explaining that he feared sleeping in. Our approach to Guácharo Cave on that Tuesday, March 11th, was very different from Humboldt and Bonpland's hilly trek. The drive from San Agustín to Guácharo Cave is about 15 minutes long, winding its way past homes that are technically within the national park boundary. Benito was waiting for us. We quickly checked our equipment, and headed towards the entrance of the cave, where, for the first time, I witnessed the guácharos flying back in to their home, after a day or more of travel in search for food. It was 5:30 am.

⁷ I use the term adventure here with caution, mostly to emphasize some of the unpredictable and even risky aspects of intellectual pursuits. These pursuits, especially the ethnographic ones, must always be guided by a sense of responsibility and even humility. See Stoll 2006 for an important argument against approaching anthropology as a kind of adventure if this adventure puts others with less power at risk.

We walked swiftly along the tourist path along the Humboldt Gallery, past the Humboldt marble monument, and then into the Gallery of Silence. We quickly reached the point where we veered off the tourist path, a small set of stairs guiding us into the low waters of the out-flowing cave stream. The water slowly made its way up our chins. Our first full-body plunge occurred at Scharffenorth Pass, where we met up with a spot that required some free climbing along a smooth surface of flowstone. The *Paso del Viento* followed a few minutes later. Benito made it through first, carefully maneuvering his white gas lamp through the small air opening that the water level spared for us that day.⁸

As I squeezed my body along the *Paso del Viento*, with barely my mouth and nose over water, I thought of my mother back in 1967 making this same trek to visit her boyfriend who camped cave within. I thought, too of what might have possessed the first explorers, all cave guides, who successfully pushed this passage in 1946 and found the cavern opening up on the other side. I recalled stories of speleologists protecting their equipment in oil canisters so they could be submerged at this point without getting wet. I also regretted not having with me some *chinguirito*, the alcoholic drink made with cinnamon, cloves, sugar, and rum that the families who lived in the hamlet in front of the

⁸ I thought to myself how incredibly cumbersome this lamp was, so delicate with its cloth sheath and glass case. At this point there was the added worry that the glass, hot from the burning of the inner flame, would crack with the slightest splash of cool water. Benito had to turn it off and let it cool before moving ahead. Meanwhile, he pulled out one of his two extra light sources that run on batteries. Why not give up the gas lamps and switch to battery-operated flashlights instead? In the local economy of Caripe, he explained, replacing flashlights and batteries is much more expensive for cave guides than the purchase and upkeep of the durable gas lamps. If handled properly, these lamps can have an extremely long life. I saw guides spending a good amount of time cleaning their lamps, pulling them apart and clearing valves and knobs from the accumulation of gunk. In the cave, the guides managed to handle these lamps with impressive agility. Benito was no exception. Alan, Julia, Maribel, and I, in contrast, relied on our battery-operated and water-resistant head lamps, clipped onto our helmets, as our main sources of light.

cave would prepare and sell to the explorers. A few swigs might have made the pass a more relaxed, maybe even ecstatic affair!

Once past the *Paso del Viento*, we continued to walk 100 meters along a relatively straight passage cut through by the river. This was the *Galería del Jorobado* (Gallery of the Hunchback). Our backs welcomed relief further ahead, where the cave branches into three. Benito guided us to the side branch on our right, known as the *Cuarto del Chorro* (the Waterfall Room). Indeed, as we made our way in, we could hear the rumble of water, heightening our expectation of finding some major waterfall. In fact, it is the size of the room that magnifies the sound of a series of small waterfalls in this salon, with a height at points of 15 meters. We wiggled our way to the very end of the passage, the final portion requiring some free climbing along the flow of falling water. This last room was full of helictites, delicate calcite cave formations that resemble a stoney tangle of yarn. We noticed too a couple of overflowing petri dishes and chemistry flasks, the material remains of incomplete and forgotten science projects of years past.

We returned to the point where the main cave passage branched into three and headed westward up to the *Gran Salón del Derrumbe*. Getting there required some effort to make it up the 4 slippery meters of the *Piedra del Mecate*. Once we were all on the ledge at the top of this pass, we got on hand and knees to squirm through a small tunnel that emerged at the massive and heavily decorated *Gran Salón*, 100 meters along its east-west axis and with the ceiling hovering between 10 to 15 meters in height. It was in this room that the Speleology Section set up camp in 1965. Here too my father and Oscar Garbisu spent their 30 nights in back 1967.

We moved along the main passage of the cave, ignoring some of the side openings that now, with detailed map in hand, I could appreciate as adding over 2 kilometers of cave, some petering out into tight yet inconclusive passages, at least as of the 1971 description. We moved swiftly along a relatively straight passage that allowed comfortable walking, much along the cave's main river.

Before entering the *Galería de los Italianos* (Gallery of the Italians), we stopped for a brief rest and snack. At this point Julia suggested she stay behind since she was feeling tired and struggled to keep up with the group's pace. Coming from anyone any less experienced than Julia, I would have thought it a bad idea. Alan agreed with her, so we moved ahead, Benito calculating we would be back in a couple of hours. The *Galería de los Italianos* fascinated us with its crystalline speleothems, ranging from the absolute clear to yellow to orange to red hues cast by the mix of oxides in the calcite. Along this part of the cave is also the *Paso de la Gallina*, or the Chicken Pass, the one spot that made me most uncomfortable since it required some balance and intrepid gymnastics to make it over a 6-meter crevasse that leads to a level of passages below. Here I appreciated Benito's strength and skill, his arm reaching out to mine providing the assurance I needed to make the leap. The group's easygoing attitude and humor also helped. Alan began at this point imitating a chicken's cackle, making us all laugh (Alan spoke almost perfect Spanish). We reached the large *Salón de los Gigantes* (Giants' Salon), a massive room with over a dozen meters in height difference from end to end, requiring climbing or circumventing large breakdown blocks. At this point the cave divides into three large trunks. The first, which we did not visit, heads towards a northwest direction, and, according to the SVE description, contains impressive gypsum

crystal cups. The other two trunks run roughly parallel to each other in a southeastern direction. The northernmost of the two is known as the *Galería del Gran Cañon* (Gran Canyon Gallery), and ends in what is considered the final point of the cavern, the *Salón de la Virgen* (Virgin's Salon). The SVE description notes that

the year 1957 this point of the cave was first reached, honor which corresponded to the speleologists Juan Antonio Tronchoni and Mario Vega Herrera, accompanied by the guides Ramón Alén and Jesús Rodríguez. Doctor Oramas had left in 1956, in the Room of the Cottons, a small statue of the Coromoto Virgin made of seashells. This statue was taken to this salon that was considered the farthest point from the cave, and later, in 1961, given that it was quickly deteriorating, it was removed and replaced by a statue of marble. [SVE 1971:127]⁹

Given the obvious symbolic importance of this final room in the cave, I was somewhat disappointed when Benito told us we would be going doing the third trunk to the *Salón de las Copas*, or "Salon of the Cups," a much more decorated passage, with thick coverings of gypsum along what is appropriately referred to as the *Galería Río de Hielo*, or "Ice River Gallery." The Salon of the Cups gets its name for an astonishingly beautiful as they are delicate series of yellow-hued calcite crystals that punctuate the center of a crystal-crusting pool, just as solid water lilies, or, flat-topped cups. Since our visit occurred in the dry season, the pool had no water, but one could appreciate the beauty of the formation nevertheless.

We turned back on our way to meet Julia, who patiently waited for four hours in what is, in her esteem, one of the quietest caves she had ever been in. This description would have shocked Humboldt who only knew the part of the cavern that guácharos had

⁹ The virgin statue referenced in the SVE description of the *Salón de la Virgen* was eventually removed from the cave and placed in a small niche located across the entrance of Guácharo Cave. This spot contains other small religious statues, and is said to have been the site, until recently, of catholic masses.

made their home. Once back in the *Gran Salón*, Benito followed through with his promise of taking us into a beautifully decorated room known as the *Salón de Alén*, named in honor of the famous cave guide Ramón Alén who discovered this part of the cave and was, as previously noted, among the first to cross the *Paso del Viento* and reach the *Salón de la Virgen*. It was approximately 4 pm when we saw daylight again.

As I prepared the narrative of my visit to the depths of Guácharo Cave, I looked at my enlarged copy of the 2007 Guácharo Cave map, now scribbled with own notes—my personal palimpsest. I am convinced I *know* the cave better, this graphic representation, providing a two dimensional structure upon which to link notes, histories, paths of relatedness. As for me, the cave map reader—the Guácharo Cave tourist, the ethnographer-in-training—these representations aided my construction of a narrative of yet another visit to this formidable place. They also helped and affected my mental reconstruction of that place. The process was and remains a deeply emotional as well. Through these maps and the stories of people who know Guácharo Cave intimately and knew my father and godfather, I power a fiction, that somehow I am not a stranger like any other tourist, that somehow this is a kind of home coming, that I belong.

Bibliography

- Abramson, Allen, and Robert Fletcher
2007 Recreating the Vertical: Rock-Climbing as Epic and Deep Eco-Play. *Anthropology Today* 23(6):3-7.
- Aitken, Stuart C.
1986 A Phenomenology of Caving. *The Canadian Caver* 18(2):26-29.
- Altez, Rogelio
2006 El desastre de 1812 en Venezuela: Sismos, vulnerabilidades y una patria no tan boba. Caracas: Fundación Empresas Polar, Universidad Católica Andrés Bello.
- Alvarado Jahn, Raul
1966 Geoespeleología básica I: Geología general tema 2. *El Guácharo* 2(1):6-12.
- Alvarado Jahn, Raul, and Julio Lescarbourea
1967 Requisitos indispensables para el establecimiento de una estación microclimática subterránea. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):15-24.
- Anderson, Benedict
1991 *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London: Verso.
- Appadurai, Arjun
1986 Introduction: Commodities and the Politics of Value. *In* *The Social Life of Things: Commodities in Cultural Perspective*. A. Appadurai, ed. Pp. 3-63. Cambridge: Cambridge University Press.
- Arvelo-Jiménez, Nelly
2000 Three Crises in the History of Ye'kuana Cultural Continuity. *Ethnohistory* 47(3-4):731-746.
- Arvelo-Jiménez, Nelly, and Horacio Biord Castillo
1990 La antropología en Venezuela: Balance y perspectivas. *In* *A antropologia na America Latina*. G. de Cerqueira Leite Zarur, ed. Mexico City: Instituto Panamericano de Geografía e Historia.
- Ashmore, Wendy, and Arthur Bernard Knapp
1999 *Archaeologies of Landscape: Contemporary Perspectives*. Malden: Blackwell Publishers.

- Bachelard, Gaston
1994[1969] *The Poetics of Space*. Boston: Beacon Press.
- Bahn, Paul G.
2004 Art in Caves. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 83-84. New York: Fitzroy Dearborn.
- Bahloul, Joelle
1996 *The Architecture of Memory: A Jewish-Muslim Household in Colonial Algeria, 1937-1962*. Cambridge: Cambridge University Press.
- Ballard, Chris, and Glenn Banks
2003 Resource Wars: The Anthropology of Mining. *Annual Review of Anthropology* 32:287-313.
- Bateson, Gregory
1972[1955] *Steps to an Ecology of Mind*. New York: Ballantine.
- Bednarik, Robert
2004 Art in Caves: History. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 85-86. New York: Fitzroy Dearborn.
- Bertarelli, Luigi Vittorio, and Eugenio Boegan
1926 *Duemila Grotte: Quarant'anni di esplorazioni nella Venezia Giulia*. Milan: Touring Club Italiano.
- Biagioli, Mario
1999a Introduction: Science Studies and Its Disciplinary Predicaments. *In The Science Studies Reader*. M. Biagioli, ed. Pp. xi-xviii. New York: Routledge.
1999b *The Science Studies Reader*. New York: Routledge.
- Bille, Mikkel, and Tim Flohr Sørensen
2007 An Anthropology of Luminosity: The Agency of Light. *Journal of Material Culture* 12:263-284.
- Biord Castillo, Horacio
2006 Dinámicas étnicas y demarcación de territorios indígenas en el nororiente de Venezuela. *Antropológica (Revista del Instituto Caribe de Antropología y Sociología, Fundación la Salle de Ciencias Naturales, Caracas)* 105-106:131-160.
- Bonsall, Clive, and Chris Tolan-Smith, eds.
1997 *The Human Use of Caves*. Oxford: Archaeopress.

- Boone, Elizabeth Hill, and Walter Mignolo, eds.
1994 *Writing without Words: Alternative Literacies in Mesoamerica and the Andes*. Durham: Duke University Press.
- Bosque, Carlos
2004 Oilbirds (Steatornithidae). *In* Grzimek's Animal Life Encyclopedia. Vol. 9. Birds II. 2nd Ed. M. Hutchins, A.V. Evans, J.A.J. Jackson, D.G. Kleiman, J.B. Murphy, and D.A. Thoney, eds. Pp. 373-376. Detroit: Gale.
- Bosque, Carlos, Rudyard Ramírez, and Domingo Rodríguez
1995 The Diet of the Oilbird in Venezuela. *Ornitología Neotropical* 6:67-80.
- Bourdieu, Pierre
2000[1972] *Outline of a Theory of Practice*. R. Nice, transl. Volume 16. Cambridge: The University of Cambridge.
- Boyer, Dominic, and Claudio Lomnitz
2005 Intellectuals and Nationalism: Anthropological Engagements. *Annual Review of Anthropology* 34:105-120.
- Brady, James, and Keith Prufer, eds.
2005 *In the Maw of the Earth Monster*. Austin: University of Texas Press.
- Briceño Monzón, Claudio Alberto
2005 Visiones geohistóricas del siglo XIX venezolano en las obras de Alejandro Humboldt, Friedrich Gerstácker y Christian Anton Göering. *Presente y pasado. Revista de Historia* 10(20):88-106.
- Brucker, Roger W., and Richard Watson
1987 *The Longest Cave*. Carbondale: Southern Illinois University Press.
- Burnett, D. Graham
2000 *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado*. Chicago: University of Chicago Press.
- Calderón, Ruiz, ed.
1992 *La ciencia en Venezuela: Pasado, presente y futuro*. Caracas: Cuadernos Lagovén.
- Cañizares-Esguerra, Jorge
2005 How Derivative Was Humboldt? *In* *Colonial Botany: Science, Commerce, and Politics in the Early Modern World*. L.L. Schiebinger and C. Swan, eds. Pp. 148-165. Philadelphia: University of Pennsylvania Press.
- 2006 *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World*. Stanford: Stanford University Press.

- Cant, Sarah G.
 2003 The Tug of Danger with the Magnetism of Mystery: Descent into the Comprehensive, Poetic-Sensuous Appeal of Caves. *Tourist Studies* 3(1):67-81.
- 2006 British Speleologies: Geographies of Science, Personality and Practice, 1935-1953. *Journal of Historical Geography* 32:775-795.
- Carneiro, Ana
 2005 Outside Government Science, 'Not a Single Tiny Bone to Cheer Us Up!' The Geological Survey of Portugal (1857-1908), the Involvement of Common Men, and the Reaction of Civil Society to Geological Research. *Annals of Science* 62(2):141-204.
- Carreño, Rafael
 2004 Soberanía Espeleológica: ¿Competir o Compartir Hallazgos Bajo Tierra? *Boletín de la Sociedad Venezolana de Espeleología* 38:61-64.
- Carrera Damas, Germán
 1972 *Historia contemporánea de Venezuela*. Caracas: Universidad Central de Venezuela.
- Carrera, Magali M.
 2011 *Traveling from New Spain to Mexico: Mapping Practices of Nineteenth-Century Mexico*. Durham and London: Duke University Press.
- Carrillo, José María
 2003 *Academia de Ciencias Físicas, Matemáticas y Naturales: Datos históricos y biográficos*. Caracas: Academia de Ciencias Físicas, Matemáticas y Naturales, Fundación Polar.
- Carsten, Janet
 1995 The Substance of Kinship and the Heat of the Hearth: Feeding, Personhood, and Relatedness among Malays in Pulau Langkawi. *American Ethnologist* 22(2):223-241.
- Carter, Paul
 1988 *The Road to Botany Bay: An Exploration of Landscape and History*. New York: Knopf.
- Casteret, Norbert
 1938 *Ten Years under the Earth*. New York: The Greystone Press.
- Casteret, Norbert
 1961 *Ma vie souterraine: Mémoires d'un spéléologue*. Editions Flammarion.
- Chabert, Claude, and Richard Watson
 1981 Mapping and Measuring Caves: A Conceptual Analysis. *NSS Bulletin* 43:3-11.
- Christen, Catherine A.
 2002 At Home in the Field: Smithsonian Tropical Science Field Stations in the U. S. Panama Canal Zone and the Republic of Panama. *The Americas* 58(4):537-575.

Codazzi, Agustín

1960 Obras escogidas. Colección Biblioteca Venezolana de Cultura, 2 V. Caracas: Ministerio de Educación, Dirección de Cultura y Bellas Artes.

1974[1835] Cueva del Guácharo. *In* Gaceta de Venezuela. Reprinted in El Guácharo vol. 7 (2): 74-79. Pp. 2-4, Vol. 18.

Coronil, Fernando

1995 Introduction to the Duke University Press Edition Transculturation and the Politics of Theory: Countering the Center, Cuban Counterpoint. *In* Cuban Counterpoint: Tobacco and Sugar. Pp. ix-1vi. Durham: Duke University Press.

1996 Beyond Occidentalism: Towards Non-Imperial Geohistorical Categories. *Cultural anthropology* 11(1):51-87.

1997 The Magical State: Nature, Money, and Modernity in Venezuela. Chicago: The University of Chicago Press.

Cosgrove, Denis E.

1999 Introduction: Mapping Meanings. *In* Mappings. Pp. 1 - 23. London: Reaktion Books.

Cosgrove, Denis E., and Veronica Della Dora

2009 High Places: Cultural Geographies of Mountains, Ice and Science. New York: I.B. Tauris & Co.

Craib, Raymond B.

2004 Cartographic Mexico: A History of State Fixations and Fugitive Landscapes. Durham, N.C.: Duke University Press.

Crothers, George, P. Willey, and Patty Jo Watson

2007 Cave Archaeology and the NSS: 1941-2006. *Journal of Cave and Karst Studies* 69(1):27-34.

Csordas, Thomas J.

1994 Introduction: The Body as Representation and Being-in-the-World. *In* Embodiment and Experience: The Existential Ground of Culture and Self. T.J. Csordas, ed. Pp. 1-28. New York: Cambridge University Press.

Cunill Grau, Pedro

2007 Geohistoria de la sensibilidad en Venezuela. Caracas: Fundación Empresas Polar.

Curl, Rane

1964 On the Definition of a Cave. *Bulletin of the National Speleological Society* 2:1-6.

- Damasio, Antonio
 1999 *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. Pp. 386. London: Vintage Press.
- Dant, Tim, and Belinda Wheaton
 2007 Windsurfing: An Extreme Form of Material and Embodied Interaction? *Anthropology Today* 23(6):8-12.
- Darwin, Charles
 1884[1859] *On the Origin of Species by Means of Natural Selection, or, the Preservation of Favored Races in the Struggle for Life*. New York: D. Appleton and Company.
- De Bellard Pietri, Eugenio
 1951 La Cueva del Guácharo. Quince horas en el cuarto del Viento. La gruta del Caribe Vidal. *El Universal*, November 4 and 5: 8, 5.
- 1957 Tercera exploración a la Cueva del Guácharo. *Boletín de la Sociedad Venezolana de Ciencias Naturales* 17:322-331.
- 1957 La Cueva Alfredo Jahn. *In Revista Shell*. Pp. 43-53.
- 1969 Atlas espeleológico de Venezuela. *Boletín de la Academia de Ciencias Físicas, Matemáticas y Naturales* 29(83):1-171.
- 1980 La visita de Alejandro de Humboldt a la Cueva del Guácharo a la luz de los documentos históricos disponibles. *Boletín de la Sociedad Venezolana de Ciencias Naturales* 34(137):355-364.
- De Certeau, Michel
 1984 *The Practice of Everyday Life*. Berkeley: University of California Press.
- De Civrieux, M.
 1998 *Los Chaimas del Guácharo*. Caracas: Editorial del Banco Central de Venezuela.
- de la Peña, Guillermo
 2005 Social and Cultural Policies toward Indigenous Peoples: Perspectives from Latin America. *Annual Review of Anthropology* 34:717-739.
- de Lisio, Antonio
 2005 La idea de la “riqueza natural” en Venezuela: De la leyenda de “El Dorado” a la metáfora de la “Siembra del petróleo. *In Políticas de economía, ambiente y sociedad en tiempos de globalización*. D. Mato, ed. Pp. 211-231. Caracas: Facultad de Ciencias Económicas y Sociales.

- Deleuze, Gilles, and Felix Guattari
1987 *Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press.
- Desjarlais, Robert , and C. Jason Throop
2011 Phenomenological Approaches in Anthropology. *Annual Review of Anthropology* 40.
- Dettelbach, Michael
1996 The Natures of Cultural History. *In Cultures of Natural History*. N. Jardine, J.A. Secord, and E.C. Spary, eds. Pp. 287-304. Cambridge: Cambridge University Press.
- Dietler, M.
1998 Consumption, Agency, and Cultural Entanglement: Theoretical Implications of a Mediterranean Colonial Encounter. *In Studies in Culture Contact: Interaction, Culture Change, and Archaeology*. J.G. Cusick, ed. Pp. 288-308. Carbondale: Center for Archaeological Investigations.
- Driver, Felix
2000 Editorial: Field-Work in Geography. *Transactions of the Institute of British Geographers* 25:267-268.
- Dym, Jordana, and Karl Offen, eds.
2011 *Mapping Latin America: A Cartographic Reader*. Chicago: The University of Chicago Press.
- Eakin, Marshall C.
2002 Guest Editor's Introduction. *The Americas* 58(4):509-511.
- Eavis, Andy
2008 Welcome from the UIS President. 15th International Congress of Speleology. Electronic document, <http://www.ics2009.us/welcome.html>, accessed July 8, 2009.
- Edney, Matthew H.
1999 *Mapping an Empire: The Geographical Construction of British India, 1765-1843*. Oxford: Oxford University Press.
- Eliade, Mircea
1962 *The Forge and the Crucible*. S. Corrin, transl. New York: Harper & Brothers.
- Escobar, Arturo
1996 Constructing Nature: Elements for a Post-Structuralist Political Ecology. *Futures* 28(4):325-343.
- 1999 After Nature: Steps to an Antiessentialist Political Ecology. *Current Anthropology* 40(1):1-30.

- Eshleman, Clayton
2003 *Juniper Fuse: Upper Paleolithic Imagination & the Construction of the Underworld*. Middletown: Wesleyan University Press.
- Fabian, Johannes
2000 *Out of Our Minds: Reason and Madness in the Exploration of Central Africa*. Berkeley: University of California Press.
- Feeley-Harnik, Gillian
2001 *Ravenala Madagascariensis* Sonnerat: The Historical Ecology of a "Flagship Species" in Madagascar. *Ethnohistory* 48(1-2):32-86.
- Feinberg, Benjamin
2003 *The Devil's Book of Culture: History, Mushrooms, and Caves in Southern Mexico*. Austin: University of Texas Press.
- Ferry, Elizabeth
2005 *Not Ours Alone: Patrimony, Value, and Collectivity in Contemporary Mexico*. New York: Columbia University Press.
- Ford, Derek C.
2004 Karst. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. New York: Fitzroy Dearborn.
- Forti, Paolo
1998 Antonio Núñez Jiménez (1923-1998). *Boletín de la Sociedad Venezolana de Espeleología* 32:66-67.
- Foucault, Michel
1973 *The Order of Things: An Archaeology of the Human Sciences*. New York: Vintage Books.
- Fricke, Tom
2004 *Taking Culture Seriously: Making the Social Survey Ethnographic*. *In Discovering Successful Pathways in Children's Development*. T.S. Weisner, ed. Pp. 185-221. Chicago: University of Chicago Press.
- Galán, Carlos
1981 Técnicas de exploración utilizadas en la caza de guácharos. *El Guácharo* 21:28-35.

1991 El karst de la Fila de las Cuevas (Zona kárstica de Mata de Mango), Monagas, Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 25:1-14.

2001 Obituario de Domingo Maita (1920-2001). *Boletín de la Sociedad Venezolana de Espeleología* 35:70-71.

- Ganter, John
1988 Will We Map as We Survey? *Compass and Tape* 5(4):65-66.
- Garbisu, Oscar, and Miguel Angel Perera
1967 La Cueva Lizardo. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):45-52.
- Gibson, J. J.
1979 *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Glassman, Mark
2004 In Croatia, Explorers Make a Deep Discovery. *The New York Times*, August 17, 2004.
- Godoy, Richard
1985 Mining: Anthropological Perspectives. *Annual Review of Anthropology* 14:199-218.
- Goodenough, Elizabeth, ed.
2003 *The Secret Spaces of Childhood*. Ann Arbor: University of Michigan Press.
- Gordon, Robert J.
2006 Introduction. *In Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure*. L.A. Vivanco and R.J. Gordon, eds. Pp. 1-26. New York: Berhahn Books.
- Gudeman, Stephen, and Alberto Rivera
1990 *Conversations in Colombia: The Domestic Economy in Life and Text*. New York: Cambridge University Press.
- Habermas, Jurgen, Sara Lennox, and Frank Lennox
1974 The Public Sphere: An Encyclopedia Article (1964). *New German Critique* 3:49-55.
- Hacking, Ian
2001 *The Social Construction of What?* Cambridge: Harvard University Press.
- Hamilton-Smith, Elery
2004 Tourist Caves. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 726-729. New York: Fitzroy Dearborn.
- Harley, J. B.
1989 Deconstructing the Map. *Cartographica* 26(2):1-20.
- Harvey, D. C.
2003 'National' Identities and the Politics of Ancient Heritage: Continuity and Change at Ancient Monuments in Britain and Ireland, C.1675-1850. *Transactions of the Institute of British Geographers* 28(4):473-487.

- Hayden, Cori
 2003 *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*. Princeton: Princeton University Press.
- Helmreich, Stefan
 2007 *An Anthropologist Underwater: Immersive Soundscapes, Submarine Cyborgs, and Transductive Ethnography*. *American Ethnologist* 34(4):621-641.
- Henson, Pamela M.
 2002 *Invading Arcadia: Women Scientists in the Field in Latin America, 1900-1950*. *The Americas* 58(4):577-600.
- Hevly, Bruce
 1996 *The Heroic Science of Glacier Motion*. *Osiris, 2nd Series, Science in the Field* 11:66-86.
- Heyden, Doris
 1975 *An Interpretation of the Cave Underneath the Pyramid of the Sun in Teotihuacan, Mexico*. *American Antiquity* 40(2):131-147.
- Hill, Jonathan D.
 2000 *Colonial Transformations in Venezuela*. *Ethnohistory* 47(3-4):747-754.
- Houston, David
 2006 *Five Miles Out: Communion and Commodification among the Mountaineers*. *In Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure*. L.A. Vivanco and R.J. Gordon, eds. Pp. 147-160. New York: Berhahn Books.
- Hull, Matthew
 2003 *Paper Travails: Agency, Authority, and Autography in a Pakistan Bureaucracy*. *Language and Communication* 23:287-314.
- Humboldt, Alexander von
 1966[1818] *Personal Narrative of Travels to the Equinoctial Regions of the New Continent During the Years 1799-1804*. H.M. Williams, transl. Volume III. New York: AMS Press, INC.
 1981[1817] *Sobre el Steatornis, nuevo género de ave nocturna*. Traducción de María Eugenia Esparragosa y Omar Linares. *In El Guácharo*. Pp. 21-22, Vol. 20. Caracas: Sociedad Venezolana de Espeleología.
- Hutchins, Ed
 1995 *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Ingold, Tim
 2000 *The Perception of the Environment: Essay in Livelihood, Dwelling and Skill*. London: Routledge.

- 2005 The Eye of the Storm: Visual Perception and the Weather. *Visual Studies* 20(2):97-104.
- 2007 *Lines: A Brief History*. New York: Routledge.
- Jackson, Jean E., and Kay B. Warren
 2005 Indigenous Movements in Latin America, 1992-2004: Controversies, Ironies, New Directions. *Annual Review of Anthropology* 34:549-573.
- Jackson, Michael
 1989 *Paths toward a Clearing: Radical Empiricism and Ethnographic Inquiry*. Bloomington: Indiana University Press.
- 1996 *Things as They Are: New Directions in Phenomenological Anthropology*. Bloomington: Indiana University Press.
- Jardine, Nicholas, and E. C. Spary
 1996 The Natures of Cultural History. *In Cultures of Natural History*. N. Jardine, J.A. Secord, and E.C. Spary, eds. Pp. 3-13. Cambridge: Cambridge University Press.
- Johnson, Nuala
 1995 Cast in Stone: Monuments, Geography and Nationalism. *Society and Space* 13:51-65.
- Keane, Webb
 1997 *Signs of Recognition: Powers and Hazards of Representation in an Indonesian Society*. Berkeley: University of California Press.
- 2003a Self-Interpretation, Agency, and the Objects of Anthropology: Reflections on a Genealogy. *Society for Comparative Study of Society and History* 3:222-248.
- 2003b Semiotics and the Social Analysis of Material Things. *Language and Communication* 23(3-4):409-425.
- Kennedy, Alasdair
 2008 In Search of the 'True Prospect': Making and Knowing the Giant's Causeway as a Field Site in the Seventeenth Century. *British Journal for the History of Science* 41(1):19-41.
- Klimchouk, Alexander
 2004 Caves. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 203-205. New York: Fitzroy Dearborn.
- Kuklick, Henrika, and Robert E. Kohler
 1996 Introduction. *Osiris, 2nd Series, Science in the Field* 11:1-14.

- Lafuente, Antonio, and Leoncio López-Ocón
 2006 Chapter 4: Scientific Traditions and Enlightenment Expeditions in Eighteenth-Century Hispanic America. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 123 - 150. Austin: University of Texas Press.
- Latour, Bruno
 1988 *The Pasteurization of France*. Cambridge, Mass.: Harvard University Press.
- 1999 *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge: Harvard University Press.
- Law, John, and Annemarie Mol, eds.
 2006 *Complexities: Social Studies of Knowledge Practices*. Durham: Duke University Press.
- Leder, Drew
 1990 *The Absent Body*. Chicago: University of Chicago Press.
- Leigh Star, Susan, and James R. Griesemer
 1999[1989] Institutional Ecology, "Translation," and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *In The Science Studies Reader*. M. Biagioli, ed. Pp. 505-524. New York: Routledge.
- Lévi-Strauss, Claude
 1992[1955] *Tristes Tropiques*. J.a.D. Weightman, transl. New York: Penguin Books.
- Linares, Omar
 1967 Extensión de distribución para "*Lonchophylla robusta*". *Boletín de la Sociedad Venezolana de Espeleología* 1(1):53-60.
- Livingstone, David N.
 2003 *Putting Science in Its Place: Geographies of Scientific Knowledge*. Chicago: University of Chicago Press.
- Lorimer, Hayden
 2005 Cultural Geography: The Busyness of Being 'More-Than-Representational' Progress in Human Geography *Compass* 29(1):83-94.
- Lorimer, Hayden, and Nick Spedding
 2005 Locating Field Science: A Geographical Family Expedition to Glen Roy, Scotland. *British Journal for the History of Science* 38(136):13-34.
- Lozoya, Xavier
 2006 Chapter 1: Natural History and Herbal Medicine in Sixteenth-Century America. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 29-50. Austin: University of Texas Press.

- Lynch, Martin
2002 *Mining in World History*. London: Reaktion Books.
- Lynch, Michael, and John Law
1988 Lists, Field Guides, and the Descriptive Organization of Seeing: Birdwatching as an Exemplary Observational Activity. *Human Studies* 11(2-3):271-303.
- 1999[1988] Pictures, Text, and Objects: The Literary Language Game of Bird-Watching. *In* *The Science Studies Reader*. M. Biagioli, ed. Pp. 317-341. New York: Routledge.
- MacLaren, I.S., Eric Higgs, and Gabrielle Zezulka-Mailloux
2005 *Mapper of Mountains: M.P. Brdglan in the Canadian Rockies 1902-1930*. Edmonton: The University of Alberta Press.
- MacLeod, Barbara, and Dennis Puleston
1978 Pathways into Darkness: The Search for the Road to Xibalbá. *In* *Teresa Mesa Redonda de Palenque*. M.G. Robertson and D.C. Jeffers, eds. Pp. 71-77. Monterey: Hearld Peters.
- Macpherson, Hannah
2010 Non-Representational Approaches to Body–Landscape Relations. *Geography Compass* 4(1):1-13.
- Maldonado, Marta M., Manuel Valdés-Pizzini, and Alfonso R. Latoni
1999 Owning and Contesting El Yunque: Forest Resources, Politics, and Culture in Puerto Rico. *Berkeley Journal of Sociology: A Critical Review* 44:82-101.
- Mancini, Massimo , and Paolo Forti
2009 The Oldest Printed Cave Maps in the World 15th International Congress of Speleology, Kerrville, Texas, 2009. Vol. 3, pp. 2011.
- Massey, Doreen B.
2005 *For Space*. Thousand Oaks: Sage.
- Matthews, W. H.
1922 *Mazes and Labyrinths: A General Account of Their History and Developments*. London: Longmans, Green.
- Mauss, Marcel
1973[1950] Techniques of the Body. *Economy and Society* 2(1):70-88.
- McCook, Stuart
2002 'Giving Plants a Civil Status': Scientific Representations of Nature and Nation in Costa Rica and Venezuela, 1885-1935. *The Americas* 58(4):513-536.
- Merleau-Ponty, Maurice
2005[1945] *Phenomenology of Perception*. C. Smith, transl. New York: Routledge Classics.

- Mignolo, Walter
2005 *The Idea of Latin America*. Malden: Blackwell Publishers.
- Mintz, Sidney W.
1985 *Sweetness and Power: The Place of Sugar in Modern History*. New York: Penguin Books.
- Mlekuž, Dimitrij
2011 What Can Bodies Do? Bodies and Caves in the Karst Neolithic. *Documenta Praehistorica* 38:1-11.
- Mol, Annemarie
2002 *The Body Multiple: Ontology in Medical Practice*. Durham and London: Duke University Press.
- Mueggler, Erik
2001 *The Age of Wild Ghosts: Memory, Violence, and Place in Southwest China*. Berkeley: University of California Press.
- 2005a *The Lapponicum Sea: Matter, Sense, and Affect in the Botanical Exploration of Southwest China and Tibet*. *Society for Comparative Study of Society and History*:442-479.
- 2005b *Reading, Glaciers, and Love in the Botanical Exploration of China's Borderlands*. *Michigan Quarterly Review* 44(4):722-754.
- 2011 *Bodies Real and Virtual: Joseph Rock and Enrico Caruso in the Sino-Tibetan Borderlands*. *Comparative Studies in Society and History* 53(1):6-37.
- Nader, Laura
1969 *Up the Anthropologist—Perspectives Gained from Studying Up*. In *Reinventing Anthropology*. D.H. Hymes, ed. Pp. 284-311. New York: Pantheon Books.
- Nagel, Thomas
1986 *The View from Nowhere*. New York: Oxford University Press.
- Naylor, Simon
2003 *Introduction: Historical Geographies of Science - Places, Contexts, Cartographies*. *British Journal for the History of Science* 38(136):1-13.
- Nerlich, Michael
1987 *Ideology of Adventure: Studies in Modern Consciousness, 1100-1750*. 2 vols. R. Crowley, transl. Minneapolis: University of Minnesota Press.

- Ness, Sally Ann
2011 Bouldering in Yosemite: Emergent Signs of Place and Landscape. *American Anthropologist* 113(1):71-87.
- North, Leslie
2011 Informal Karst Education in the United States and Internationally. *Geography*, University of South Florida.
- Olwig, Kenneth
2002 Landscape, Nature, and the Body Politic: From Britain's Renaissance to America's New World. Madison: The University of Wisconsin Press.
- Ortiz, Fernando
2001[1940] *Cuban Counterpoint: Tobacco and Sugar*. H.P. Vila, transl. Durham: Duke University Press.
- Ortner, Sherry
1984 Theory in Anthropology since the Sixties. *Comparative Studies in Society and History* 26:126-66.

1999 *Life and Death on Mt. Everest: Sherpas and Himalayan Mountaineering*. Princeton, N.J.: Princeton University Press.

2001 Commentary: Practice, Power and the Past. *Journal of Social Archaeology* 1(2):271-278.
- Palmer, Catherine
2002 'Shit Happens': The Selling of Risk in Extreme Sports. *The Australian Journal of Anthropology* 13(3):323.
- Parrish, Susan Scott
2006 *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World*. Chapel Hill: University of North Carolina Press.
- Peluso, Nancy
1995 Whose Woods Are These? Counter-Mapping Forest Territories in Kalimantan, Indonesia. *Antipode* 27(4):383-406.
- Peñalver Bermúdez, Luis
1993 *Los Chaimas*. Maturín: LitOriente, C.A.
- Pereda Núñez, José
2007 *Fundación La Salle de Ciencias Naturales: Un Modelo Científico-Educativo que Favorece la "Opción Preferencial Por los Pobres"*. Roma: Hermanos de las Escuelas Cristianas.

- Perera, Miguel Angel
 1976a Editorial. *Boletín de la Sociedad Venezolana de Espeleología* 7(14):127-128.
- 1976b Notas sobre una excavación en la Cueva del Guácharo (Mo. 1), Estado Monagas, Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 7(14):249-265.
- 1988 La espeleología histórica en la antropología nacional: Logros y perspectivas (veinte años de actividades 1967-1987). *Boletín de la Sociedad Venezolana de Espeleología* 23:17-29.
- Pérez, María A., and Govinda Galindo
 2009 The Guides of Venezuela's Guácharo Cave: A Historical and Ethnographic Study of Locals' Contribution to Its Promotion, Exploration, and Conservation. 15th International Congress of Speleology, Kerrville, Texas, 2009. Vol. 2, pp. 1202-1207. Greyhound Press.
- Pérez, Wilmer
 1966 Una nota en el estudio bioespeleológico: La micosis. *El Guácharo* 2(1):3-5.
- Pohl, Mary, and John Pohl
 1983 Ancient Maya Cave Ritual. *Archaeology* 36(3):28-51.
- Pratt, Mary Louise
 1992 *Imperial Eyes: Travel Writing and Transculturation*. New York: Routledge.
- Radcliffe, Sarah A., and Sallie Westwood
 1996 *Remaking the Nation: Place, Identity and Politics in Latin America*. New York: Routledge.
- Raffles, Hugh
 1999 "Local Theory": Nature and the Making of an Amazonian Place. *Cultural Anthropology* 14(3):323-360.
- 2002a *In Amazonia: A Natural History*. Princeton: Princeton University Press.
- 2002b *Intimate Knowledge*. ISSJ 173:325-335.
- Ranger, Terrence O.
 1999 *Voices from the Rocks: Nature, Culture & History in the Matopos Hills of Zimbabwe*. Bloomington: Indiana University Press.
- Reig, Alejandro
 2006/2007 The Orinoco Headwaters Expedition as a Turning Point in the Development of External Territorializations of the Venezuelan Amazon. *Cambridge Anthropology* 26(2):57-68.

- Rogelio León, Domingo, and Rudy Mostacero Villarreal
1997 *Caripe: Historia Cotidiana y Oralidad*. Maturin: Ediciones Gobernación del Estado Monagas.
- Romero, Simón
2006 For an Ex-Dentist, the Age of Exploration Treks On. *The New York Times*, August 26, 2006: 4.
- Ronquillo, Wilfredo
1995 Anthropological and Cultural Values of Caves. *Philippine Quarterly of Culture and Society* 23:138-150.
- Rose, Mitch
2002 Landscape and Labyrinths. *Geoforum* 33(4):455-467.
- Rubenstein, Robert J.
2006 A Head for Adventure. *In Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure*. L.A. Vivanco and R.J. Gordon, eds. Pp. 235-254. New York: Berhahn Books.
- Rudwick, Martin
1989 Encounters with Adam, or at Least the Hyaenas: Nineteenth-Century Visual Representations of the Deep Past. *In History, Humanity, and Evolution: Essays for John C. Green*. J.R. Moore, ed. Pp. 231-251. Cambridge: Cambridge University Press.
- Sack, Robert David
1986 *Human Territoriality: Its Theory and History*. Cambridge: Cambridge University Press.
- Sahlins, Marshall
1985 *Islands of History*. Volume University of Chicago Press: Chicago.

1995 *How 'Natives' Think: About Captain Cook, for Example*. Chicago: University of Chicago Press.
- Saldaña, Juan José, ed.
2006a *Science in Latin America: A History*. Austin: University of Texas Press.

2006b Chapter 2: Science and Public Happiness During the Latin American Enlightenment *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 51 - 92. Austin: University of Texas Press.

2006c Introduction: The Latin American Scientific Theater. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 1-27. Austin: University of Texas Press.

- 2006d Chapter 5: Science and Freedom: Science and Technology as a Policy of the New American States. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 151 - 162. Austin: University of Texas Press.
- Scaramelli, Franz, and Kay Tarble
 2005 The Roles of Material Culture in the Colonization of the Orinoco, Venezuela. *The Journal of Social Archaeology* 5(1):135-168.
- 2000 Cultural Change and Identity in Mapoyo Burial Practice in the Middle Orinoco, Venezuela. *Ethnohistory* 47(3-4):705-729.
- Scaramelli, Franz, and Bernardo Urbani
 2006 Historia antropoespeleológica de la Sociedad Venezolana de Espeleología: Un recorrido de 40 años. *Boletín de la Sociedad Venezolana de Espeleología* 40:17-33.
- Schaper, Jo
 2003 Webster's Home Cave: Speleologist, Spelunker or Caver? Electronic document, <http://members.socket.net/~joschaper/wspelunk.html>, accessed September 19, 2011.
- Schiebinger, Londa L., and Claudia Swan
 2005 *Colonial Botany: Science, Commerce, and Politics in the Early Modern World*. Philadelphia: University of Pennsylvania Press.
- Schut, Pierre-Olaf
 2006 E. A. Martel, the Traveller Who Almost Became an Academician. *Acta Carsologica* 35(1):149-157.
- Scott, James C.
 1998 *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.
- Secord, Anne
 2002 Botany on a Plate: Pleasure and the Power of Pictures in Promoting Early Nineteenth-Century Scientific Knowledge. *Isis* 93(1):28-57.
- Shapin, Steven
 1999[1988] The House Experiment in Seventeenth-Century England. *In The Science Studies Reader*. M. Biagioli, ed. Pp. 479-504. New York: Routledge.
- 1998 Placing the View from Nowhere: Historical and Sociological Problems in the Location of Science. *Transactions of the Institute of British Geographers* 23(1):5-12.
- Shapin, Steven, and Simon Schaffer
 1985 *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton, N.J.: Princeton University Press.

Shaw, Trevor

1979 *History of Cave Science: The Exploration and Study of Limestone Caves, to 1900*.
Crymch: Sydney Speleological Society.

1978 Adolf Schmidl (1802-1863) the Father of Modern Speleology? *International Journal of Speleology* 10(3-4):253-267.

2000 Views on Cave Formation before 1900. *In* *Speleogenesis: Evolution of Karst Aquifers*.
A. Klimchouk, D.C. Ford, A.N. Palmer, and W. Dreybrodt, eds. Pp. 21-29. Huntsville:
National Speleological Society.

Sheets-Johnstone, Maxine

1990 *The Roots of Thinking*. Philadelphia: Temple University Press.

Short, John Rennie

2009 *Cartographic Encounters: Indigenous Peoples and the Exploration of the New World*.
London: Reaktion Books.

Shortland, Michael

1994 Darkness Visible: Underground Culture in the Golden Age of Geology. *History of Science* 32:1-61.

Simmel, Georg

1997 The Adventure. *In* *Simmel on Culture*. D. Frisby and M. Featherstone, eds. Pp. 221-232.
London: Sage.

Skurski, Julie

1993 *The Leader and the "People": Representing the Nation in Postcolonial Venezuela*,
Anthropology, University of Chicago.

Smida, Branislav, Marek Audy, and Lukas Vlcek

2003 *Expedicia Roraima 2003, Venezuela: Jaskyna Krystalove Oci*. *Spravodaj SSS*:192.

Smith, Jessica M.

2009 *Putting Kinship to Work: Gender and Relatedness in a Wyoming Coal Mining Community*. Ph.D. dissertation, Department of Anthropology, University of Michigan.

Spivak, Gayatri Chakravorty

1988 Can the Subaltern Speak? *In* *Marxism and the Interpretation of Culture*. C. Nelson and L.
Grossberg, eds. Pp. 271-313. Urbana: University of Illinois Press.

Stebbins, Robert A.

2007 *Serious Leisure: A Perspective for Our Time*. New Brunswick, NJ: Transaction
Publishers.

Stierman, Donald

2004 Geophysical Detection of Caves and Karstic Voids. *In* Encyclopedia of Caves and Karst Science. J. Gunn, ed. Pp. 377-379. New York: Fitzroy Dearborn.

Stoler, Ann Laura

1991 Carnal Knowledge and Imperial Power: Gender, Race, and Morality in Colonial Asia. *In* Gender at the Crossroad of Knowledge: Feminist Anthropology in the Postmodern Era. M. di Leonardo, ed. Berkeley: University of California Press.

Stoll, David

2006 Adventure and Regulation in Contemporary Anthropological Fieldwork. *In* Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure. L.A. Vivanco and R.J. Gordon, eds. Pp. 270-279. New York: Berhahn Books.

Stone, William, Barbara am Ende, and Monte Paulsen

2002 Beyond the Deep: The Deadly Descent into the World's Most Treacherous Cave. New York: Warner Books.

SVE

1967 Mi. 2 Cueva Walter Dupouy. Boletín de la Sociedad Venezolana de Espeleología 1(1):40-41.

1968 Mo. 1 Cueva del Guácharo. Boletín de la Sociedad Venezolana de Espeleología 1(2):97-107.

1971 Mo. 1 Cueva del Guácharo - 2nda parte. Boletín de la Sociedad Venezolana de Espeleología 3(2):116-131.

1973a Noticiero espeleológico: Expedición al Alto Guasare, Estado Zulia. Boletín de la Sociedad Venezolana de Espeleología 8(15):115-120.

1973b Mi. 35 Cueva Alfredo Jahn. Boletín de la Sociedad Venezolana de Espeleología 4(1):63-72.

1975 Mi. 2 Cueva Walter Dupouy. Boletín de la Sociedad Venezolana de Espeleología 6(12):114-119.

1977 Mo. 15 - Sima del Bastimento No. 1. Boletín de la Sociedad Venezolana de Espeleología 8(16):225-226.

1982 Mo. 40 - Sima Los Gonzáles. Boletín de la Sociedad Venezolana de Espeleología 10(19):205-209.

1996 Cueva del Samán. Boletín de la Sociedad Venezolana de Espeleología 25:34-39.

- 2004 Bo. 93 - Sistema Roraima Sur. Boletín de la Sociedad Venezolana de Espeleología 38:34-41.
- 2005 Posición de la comunidad espeleológica de Venezuela ante la UIS con relación a la violación del Código de Ética por espeleólogos de Eslovaquia y la República Checa. Boletín de la Sociedad Venezolana de Espeleología 39:80-81.
- Taussig, Michael
1980 *The Devil and the Commodity Fetishism in South America*. Chapel Hill: The University of North Carolina Press.
- Tauste, Francisco
1964[1678] Misión de los religiosos Capuchinos de la Provincia de Aragón en la Provincia de Cumaná. *In* Los primeros historiadores de la misiones Capuchinas en Venezuela. Pp. 79-254. Col. Biblioteca de la Academia Nacional de la Historia. Caracas: Academia Nacional de la Historia.
- 1680 *Arte y Bocabulario de la lengua de los indios Chayma, Cvmanagotos, Cores, Paria y otros diversos de la Provincia de Cvmaná o Nveva Andalvcía*. Madrid: Bernardo Villadiego.
- Taylor, Michael Ray
1996 *Cave Passages: Roaming the Underground Wilderness*. New York: Vintage Departures.
- Taylor, Michael Ray
1999 *Dark Life*. New York: Scribner.
- Taylor, Peter Lane
2004 *Off the Face of the Earth*. *In* *Adventure*.
- Texera Arnal, Yolanda
2002 The Beginnings of Modern Ornithology in Venezuela. *The Americas* 58(4):601-622.
- 2003 *La zoología en Venezuela 1936-1970: Una historia social*. Caracas: Universidad Central de Venezuela Vicerrectorado Académico, Fundación Polar.
- Thompson, Eric
1959 The Role of Caves in Maya Culture. *Mitteilungen aus dem Museum für Völkerkunde in Hamburg* 25:122-129.
- Thrift, N. J.
1996 *Spatial Formations*. London: Sage.
- Tolan-Smith, Chris, and Clive Bonsall
1997 The Human Use of Caves. *In* *The Human Use of Caves*. C. Bonsall and C. Tolan-Smith, eds. Pp. 217-218. Oxford: Archaeopress.

Trautmann, Thomas

1992 The Revolution in Ethnological Time. *Man* n.s.(27):379-397.

Tronchoni, Juan Antonio

1969 Editorial. *Boletín de la Sociedad Venezolana de Espeleología* II(1):3.

Tschümperlin, Erwin

2011 The Hoelloch Cave – History. 2011: AGH Association. Electronic document, http://www.hoellochforschung.ch/web/index.php?option=com_content&view=category&layout=blog&id=24&Itemid=41&lang=en, accessed June 16, 2011

UIS

2009 UIS Code of Ethics for Cave Exploration and Science in Foreign Countries. 2009. Electronic document, <http://www.uis-speleo.org/ethic-en.html>, accessed July 8, 2009.

Urbani, Franco

1967a La Sima del Agua Dulce. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):5-10.

1967b Las espeleotemas. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):23-24.

1969 Traducción de Pietro Jansen (1931) "Grotte e caverne del Venezuela". *La vie d'Italie e dell' America Latina*, 31 (3):287-290. *Boletín de la Sociedad Venezolana de Espeleología* 2(1):79-82.

1977 Nuevos comentarios sobre estudios realizados en las formas cársticas de las cuarcitas del Grupo Roraima, abril 1977. *Boletín de la Sociedad Venezolana de Espeleología* 8(15):71-77.

1984 Vida y obra de los iniciadores de la espeleología en Venezuela. Parte 3. John Princep, José María del Real, Alexander Walker, Francisco Zea, Pál Rosti, Simón Ugarte, Achille Müntz y Bonifacio Marcano. *Boletín de la Sociedad Venezolana de Espeleología* 21:33-50.

1993 Vida y obra de los iniciadores de la espeleología en Venezuela. Parte 5. Siglos XV al XVII. *Boletín de la Sociedad Venezolana de Espeleología* 27:7-13.

1996 Vida y obra de los iniciadores de la espeleología en Venezuela. Parte 7. Siglos XVI al XVIII. *Boletín de la Sociedad Venezolana de Espeleología* 30:38-55.

1999 Historia espeleológica Venezolana. Parte 10. Una cronología de la Cueva del Guácharo. *Boletín de la Sociedad Venezolana de Espeleología* 33:51-69.

2005a Historia espeleológica Venezolana. Part 12. Adiciones a la bibliografía y cronología de la Cueva del Guácharo. *Boletín de la Sociedad Venezolana de Espeleología* 39:2-9.

- 2005b Alejandro de Humboldt, 1799-1800: Precursor de la espeleología de Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 39:56-58.
- Urbani, Franco, and Max Furrer
2007 "Caripe y la Cueva del Guácharo" Por el Dr. Alfred Scharffenorth, 1890. *Terra* 23:129-146.
- Urbani, Franco, Carlos Galán, and Francisco Herrera
2006 55 Años de exploraciones espeleológicas en Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 40:17-33.
- Urbani, Franco, and Eugenio Szczerban
1974 Carsos de Venezuela. Parte 4: Formas cársicas en arenisca precámbricas del Territorio Federal Amazonas y Estado Bolívar. *Boletín de la Sociedad Venezolana de Espeleología* 5(1):27-54.
- Valencia Ramírez, Cristóbal
2006 Venezuela in the Eye of the Hurricane: Landing an Analysis of the Bolivarian Revolution. *Journal of Latin American Anthropology* 11(1):173-186.
- Vessuri, Hebe
1999 Los viajes de G.G. Simpson a Sudamérica: Visión científica y experiencia subjetiva. *REDES* 6(14).
- 2006 Chapter 7: Academic Science in Twentieth-Century Latin America. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 163 - 231. Austin: University of Texas Press.
- Vessuri, Hebe, and Margarita Safar
1983 Elementos para la historia social de la química en Venezuela: La Sociedad Venezolana de Química. *In La Ciencia Periférica: Ciencia y Sociedad en Venezuela*. E. Díaz, Y. Texera, and H. Vessuri, eds. Pp. 121-165s. Caracas: Monte Ávila.
- Viloria, Ángel
2002 Episodios en la naturaleza limítrofe. Cali: Panamericana Formas e Impresos.
- Vivanco, Luis Antonio, and Robert J. Gordon
2006 Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure. New York: Berhahn Books.
- Warren, Kay B., and Jean E. Jackson
2002 Indigenous Movements, Self-Representation, and the State in Latin America. Austin: University of Texas Press.
- Watson, Patty Jo, ed.
1974 The Archeology of the Mammoth Cave Area. New York: Academic Press.

- Watson, Richard
1994 *Caving*. Saint Louis: Cave Books.
- Williams, Rosalind
2008 *Notes on the Underground: An Essay on Technology, Society, and the Imagination*. Cambridge: MIT Press.
- Winichakul, Thongchai
1994 *Siam Mapped: A History of the Geo-Body of a Nation*. Honolulu: University of Hawaii Press.
- Withers, Charles W. J.
2004 Memory and the History of Geographical Knowledge: The Commemoration of Mungo Park, African Explorer. *Journal of Historical Geography* 30(2):316-339.
- Withers, C.W.J. and D.A. Finnegan
2003 Natural History Societies, Fieldwork and Local Knowledge in Nineteenth-Century Scotland: Towards a Historical Geography of Civic Science. *Cultural Geographies* 10(3):334-353.
- Wolf, Eric
1982 *Europe and the People without History*. Berkeley: University of California Press.

1988 *Inventing Society*. *American Ethnologist* 15(4):752-761.
- Wood, David
1992 *The Power of Maps*. New York: The Guilford Press.
- Wookey
2004 *Surveying Caves*. In *Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 714-717. New York: Fitzroy Dearborn.
- Wray, Robert A. L.
1997 *Quartzite Dissolution: Karst or Pseudokarst?* *Cave and Karst Science* 24(2):81-86.
- Wray, Robert A. L.
2010 *The Gran Sabana: The World's Finest Quartzite Karst?* In *Geomorphological Landscapes of the World*. P. Migon, ed. Pp. 79-88. Dordrecht: Springer+Science and Business Media.
- Yanagisako, Sylvia Junko
2002 *Producing Culture and Capital: Family Firms in Italy*. Princeton: Princeton University Press.

Yengoyan, Aram M.

2006 Simmel and Frazer: The Adventure and the Adventurer. *In* Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure. L.A. Vivanco and R.J. Gordon, eds. Pp. 27-42. New York: Berhahn Books.

Yusoff, Kathryn

2007 Antarctic Exposure: Archives of the Feeling Body. *Cultural Geographies* 14(2):211-233.

Figures

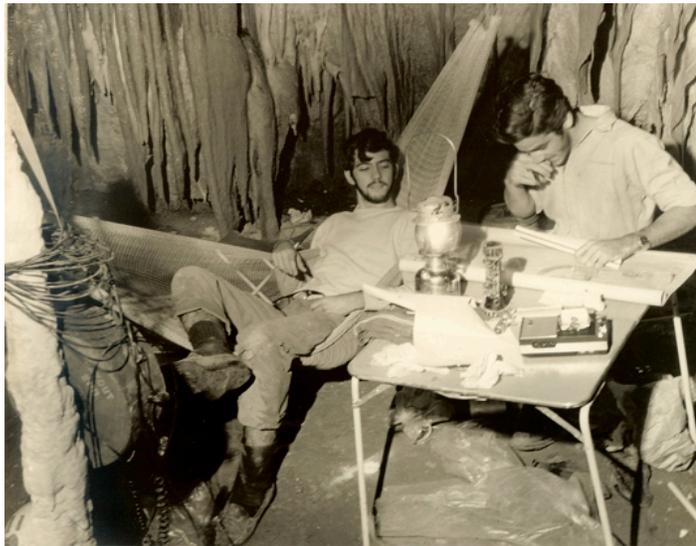


Fig. 1.1. Oscar Garbisu and Wilmer Pérez, Guácharo Cave, Caripe, Venezuela (1967) (SVE Archives).

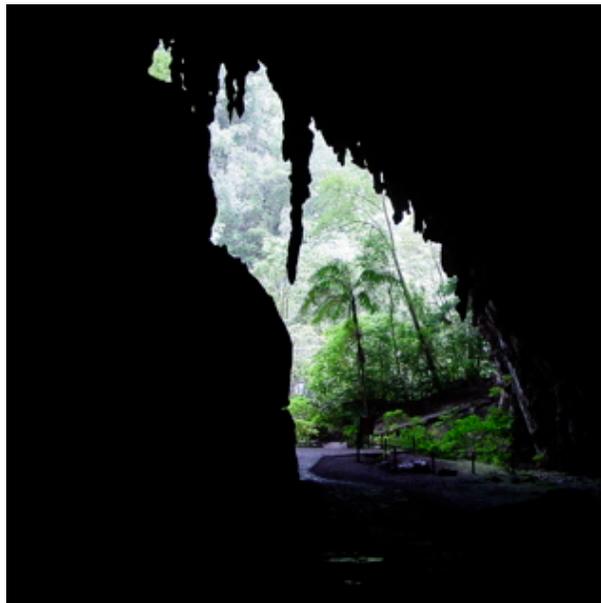


Fig. 2.1. Silhouette of the entrance of Guácharo Cave, seen from the inside, March 2008 (Author's Photo).



Fig. 2.2. A desiccated guácharo (*Steatornis caripensis*) in the Humboldt Museum located on the cave monument premises (Author's Photo).



Fig. 2.3. A tourist inspects the marble plaque honoring Humboldt inside Guácharo Cave, June 2007 (Author's Photo). The text reads:

1859-1959
 The Venezuelan Society of Natural Sciences
 Pays its tribute of admiration and respect
 To the universal wiseman
 Alexander Humboldt
 In the first centenary since his death, who arrived
 to this place the 18th of September of 1799.
 Speleology Section

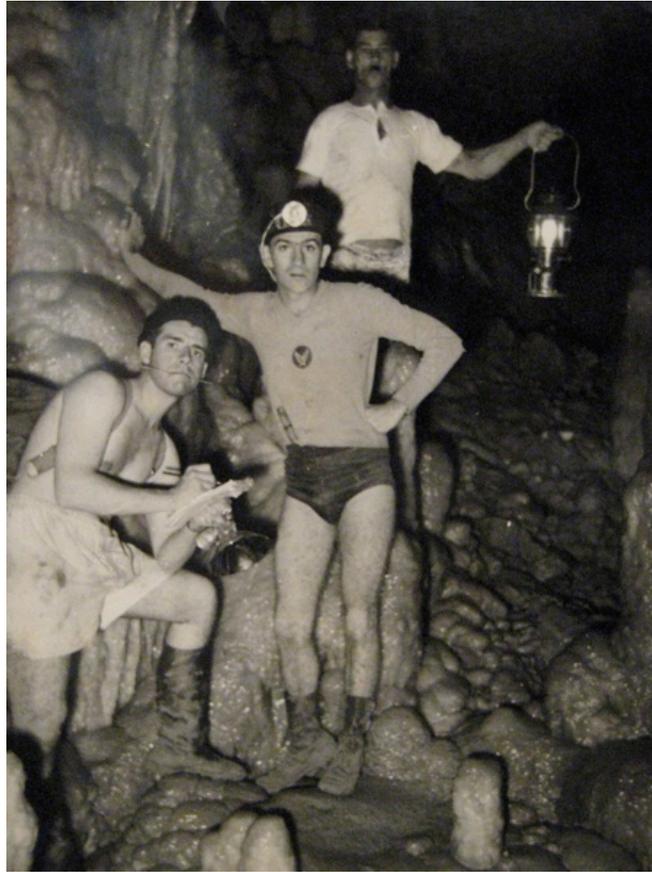


Fig. 2.4. Eugenio de Bellard, Juan Antonio Tronchoni, and cave guide Ramón Alén in Guácharo Cave, probably in the early 1950s (SVE Archives).



Fig. 2.5. Benjamín Magallanes, retired Guácharo Cave park ranger and guide and his friend Blas Salazar, son of the famed Guácharo Cave caretaker or *celador* Ramón Salazar. Blas is an active park ranger at the cave, February 2008 (Author's Photo).

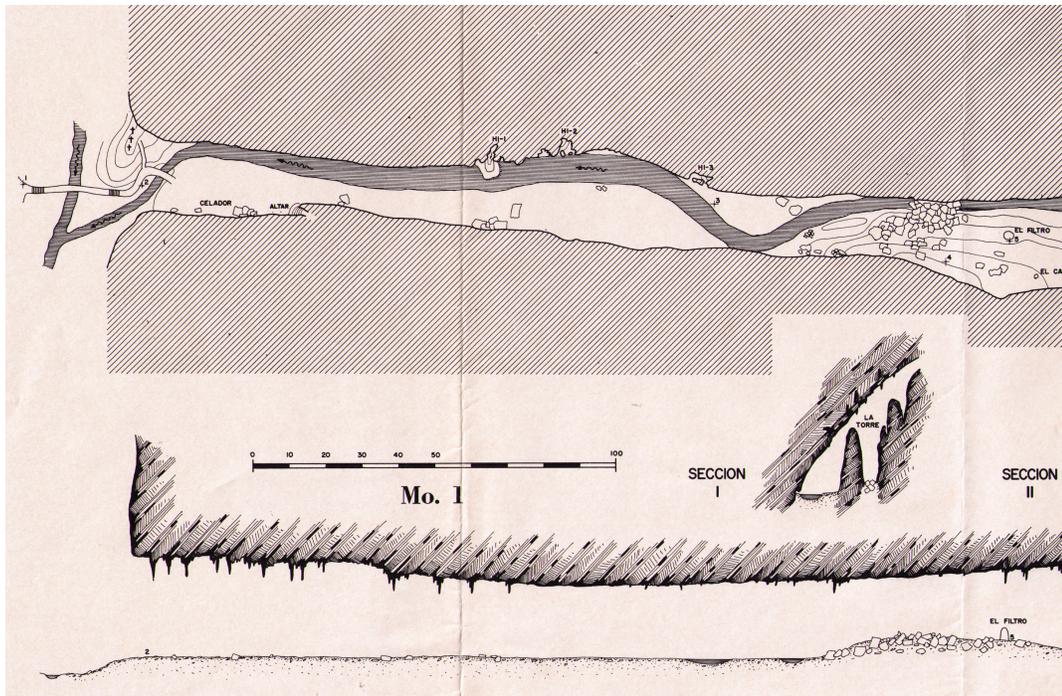


Fig. 2.6. Detail of the SVE Guácharo Cave's touristic sector map (SVE 1968). The top image is the plan view of the cave. The lower one represents the profile view of the same passage (the cave's main entrance). The smaller graphic in the middle right ("Sección I") is a cross-section of the cave, the point just beyond Humboldt's plaque.

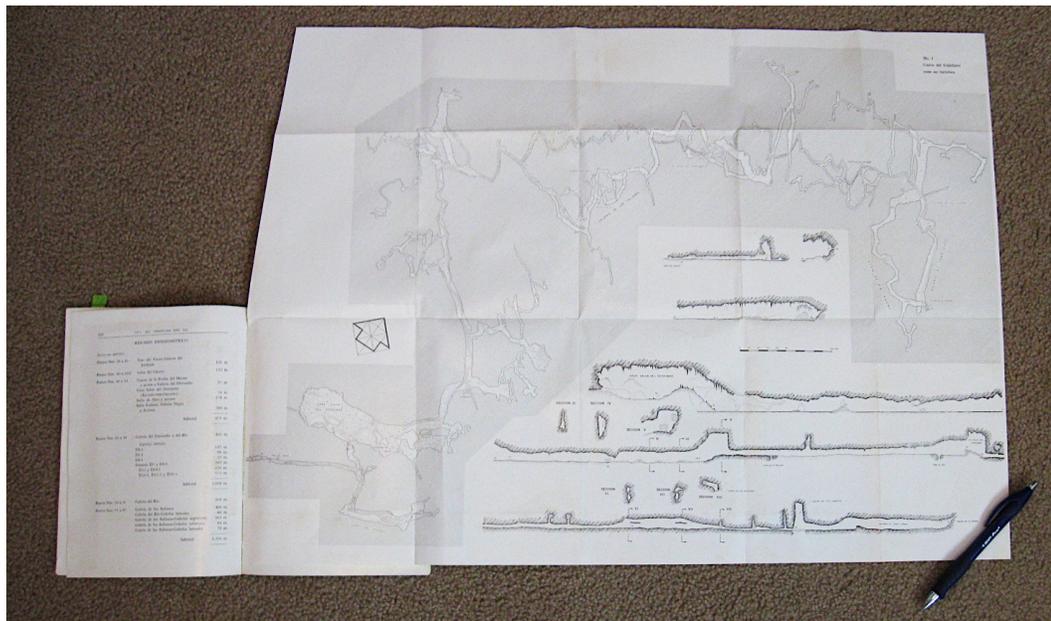


Fig. 2.7. The entire spread of the SVE Guácharo Cave map, from which the following details were taken (SVE 1971). The pen on the lower right hand corner provides scale.

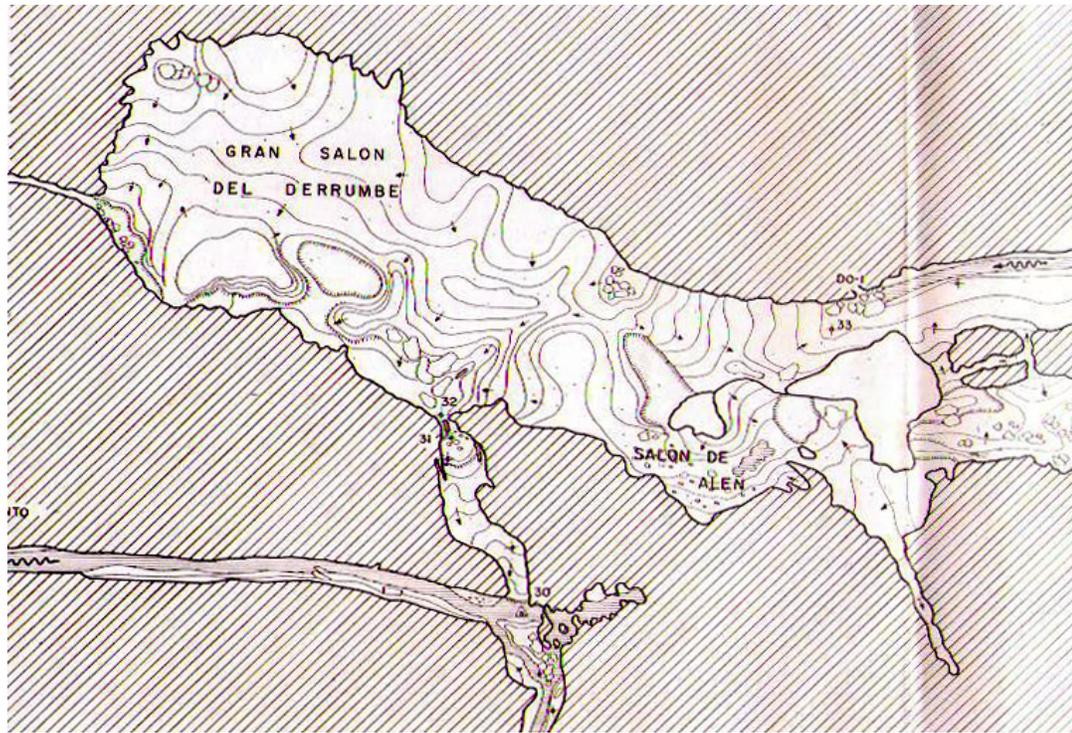


Fig. 2.9. Detail of the SVE Guácharo Cave's non-touristic sector map, showing the Gran Salón's plan view (the numbers 32 and 33 note where survey measurements were made) (SVE 1971).



Fig. 2.10. Detail of the SVE Guácharo Cave's non-touristic sector map, showing the Gran Salón's profile view (the numbers 32 and 33 note where survey measurements were made) (SVE 1971).

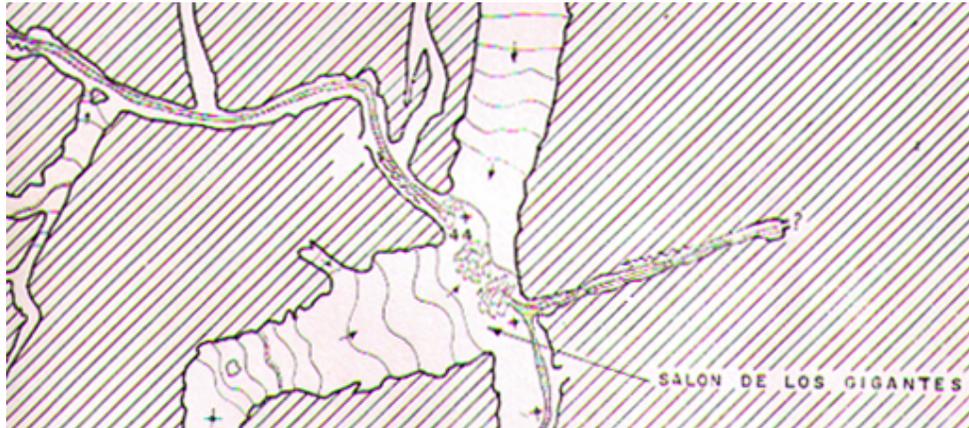


Fig. 2.11. Detail of the SVE Guácharo Cave's non-touristic sector map, showing inclusive passages (“incognitas”) marked with a question mark or left blank (SVE 1971).



Fig. 3.1 Carlos Bordón showing the author a portion of his entomology collection in the basement of his home, Maracay, Venezuela, June 2007 (Photo by Clotilde Pesquera).

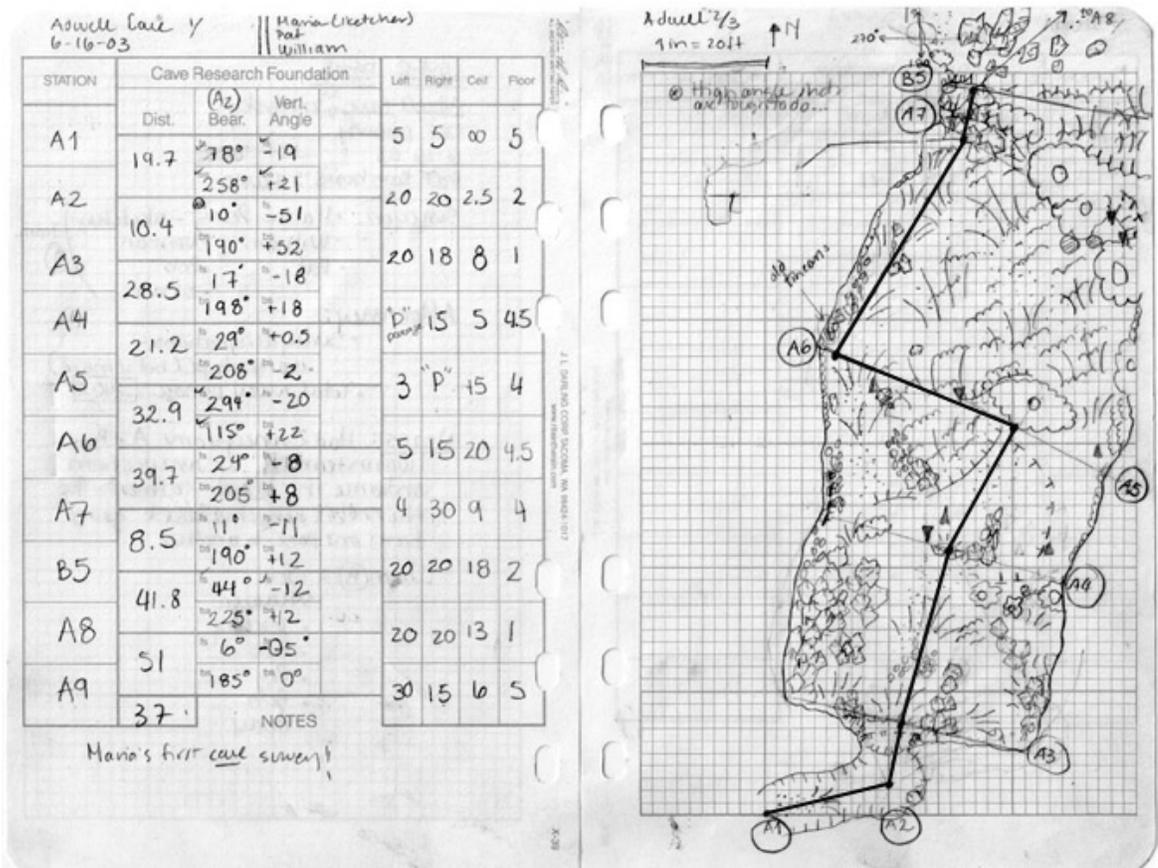


Fig. 3.2. Detail of my survey notes of Adler Cave, Kentucky (June 2003). The sketch is done to scale (here 1 inch = 20 feet). The basic principle of cave mapping involves creating a scaled two-dimensional line plot, highlighted here with a heavy black line, that represents the length, horizontal orientation, and vertical displacement of cave passages. The “view” this perspective affords is a view from “the top.”

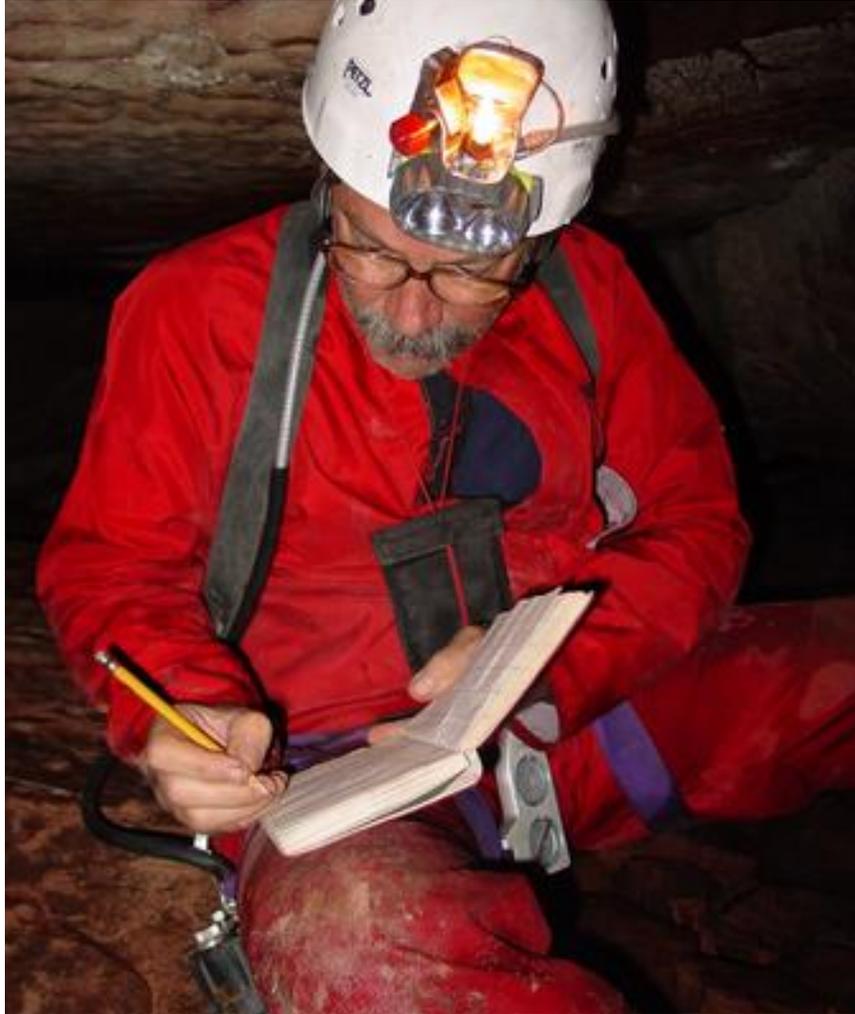


Fig. 4.1. My father, Wilmer Pérez, making survey notes in his water resistant field book inside Sistema Roraima Sur, Canaima National Park, April 2004 (Author's Photo). He uses a pencil because ink might smudge and bleed with water. He relies on a carbide lamp, attached to his helmet, for light. Carbide rocks and water produce acetylene gas inside the black plastic unit clipped to his belt. This gas connects this unit to the helmet front-piece, where a spark generates the initial flame. The helmet also has a battery-operated lantern.

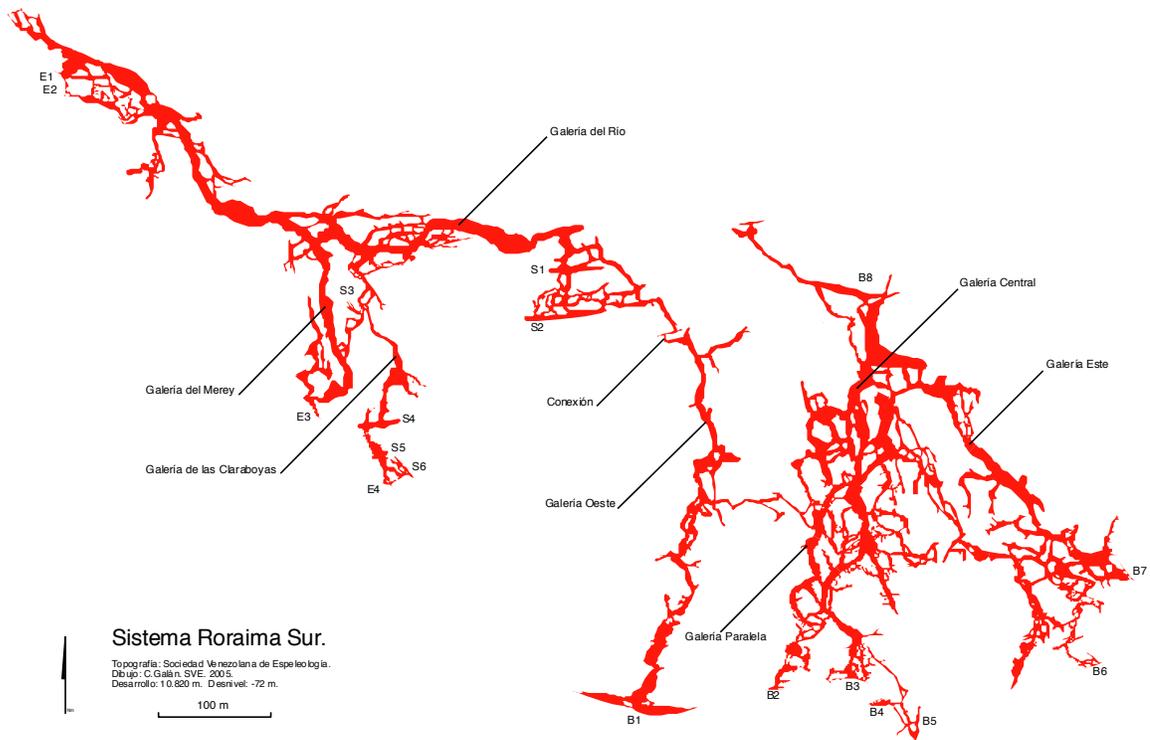


Fig. 4.2. The plan view, or view “from the top” of Sistema Roraima Sur, originally published in the *Boletín de la Sociedad Venezolana de Espeleología* (SVE 2004).

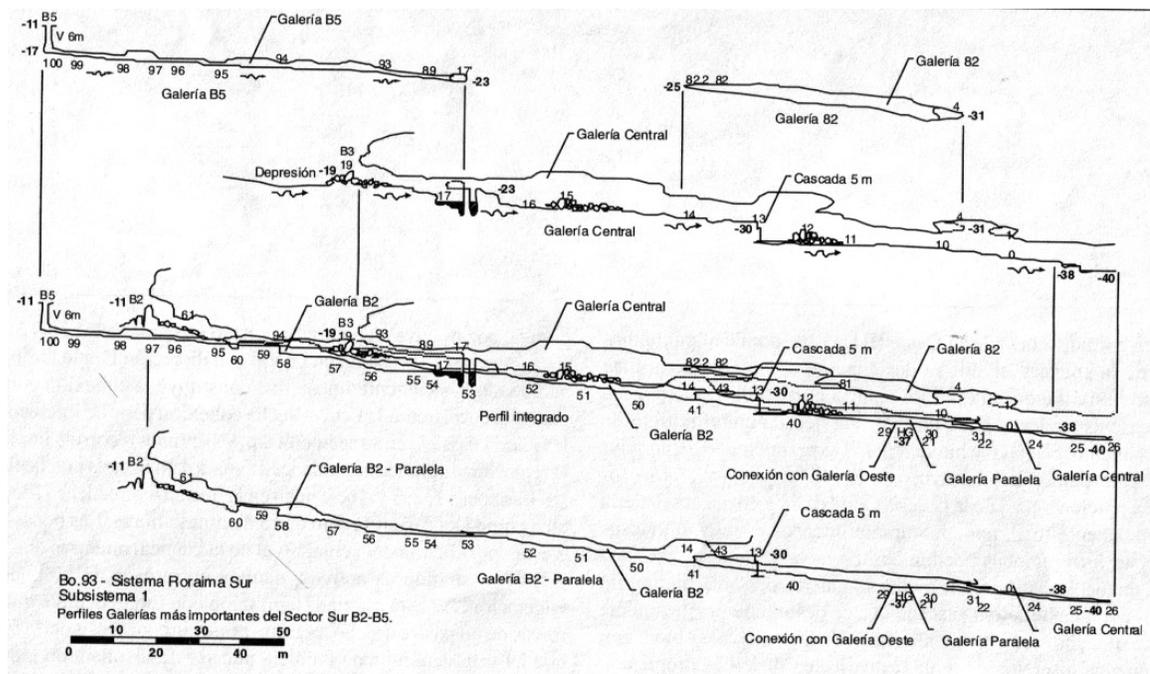


Fig. 4.3. Profile view of Sistema Roraima Sur’s Subsystem 1 (SVE 2004).

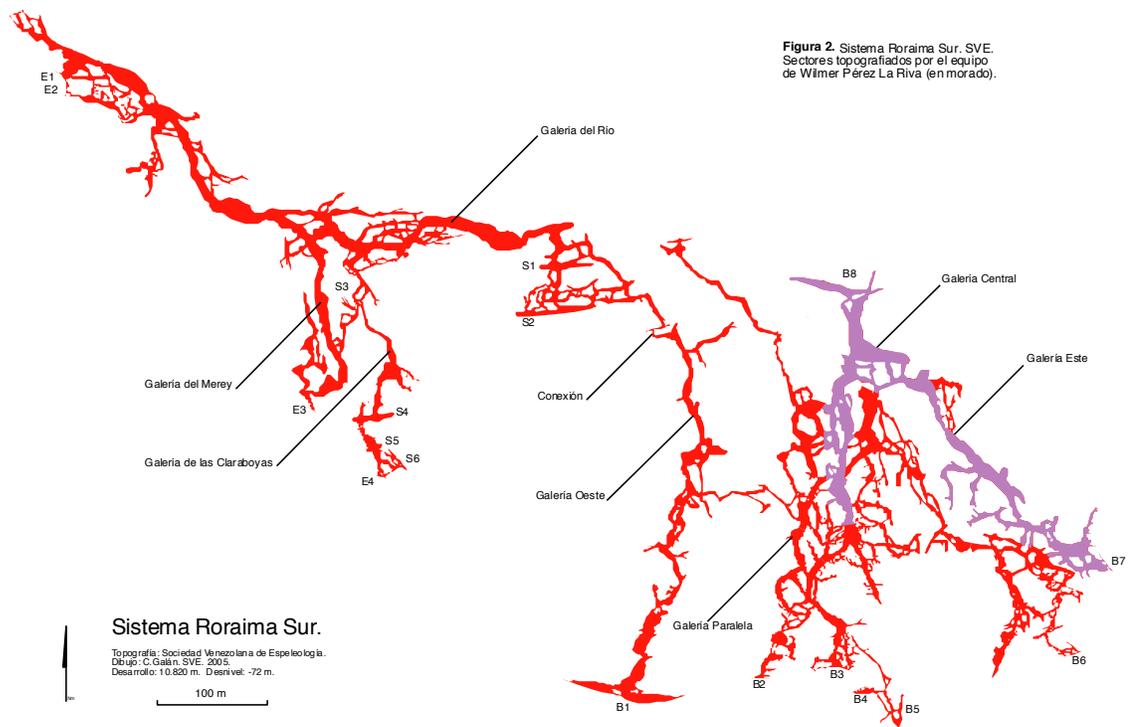


Fig. 4.4. Detail of the Sistema Roraima Sur map highlighting the section my survey team mapped (Computerized Rendition by Carlos Galán).

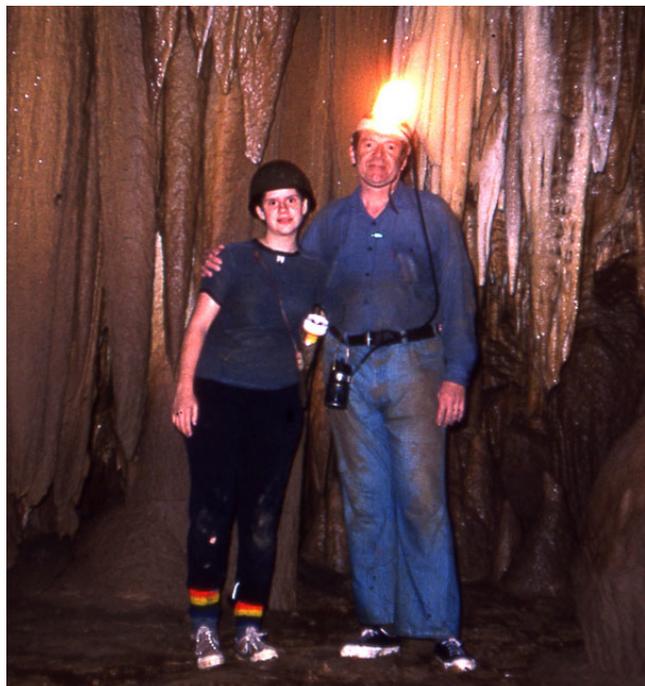
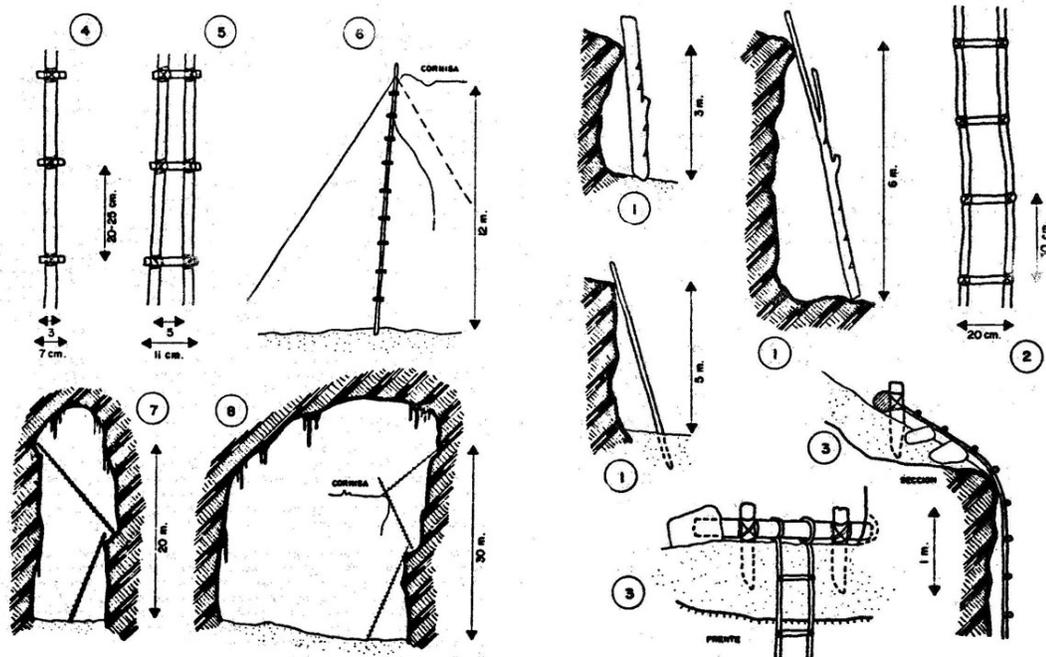
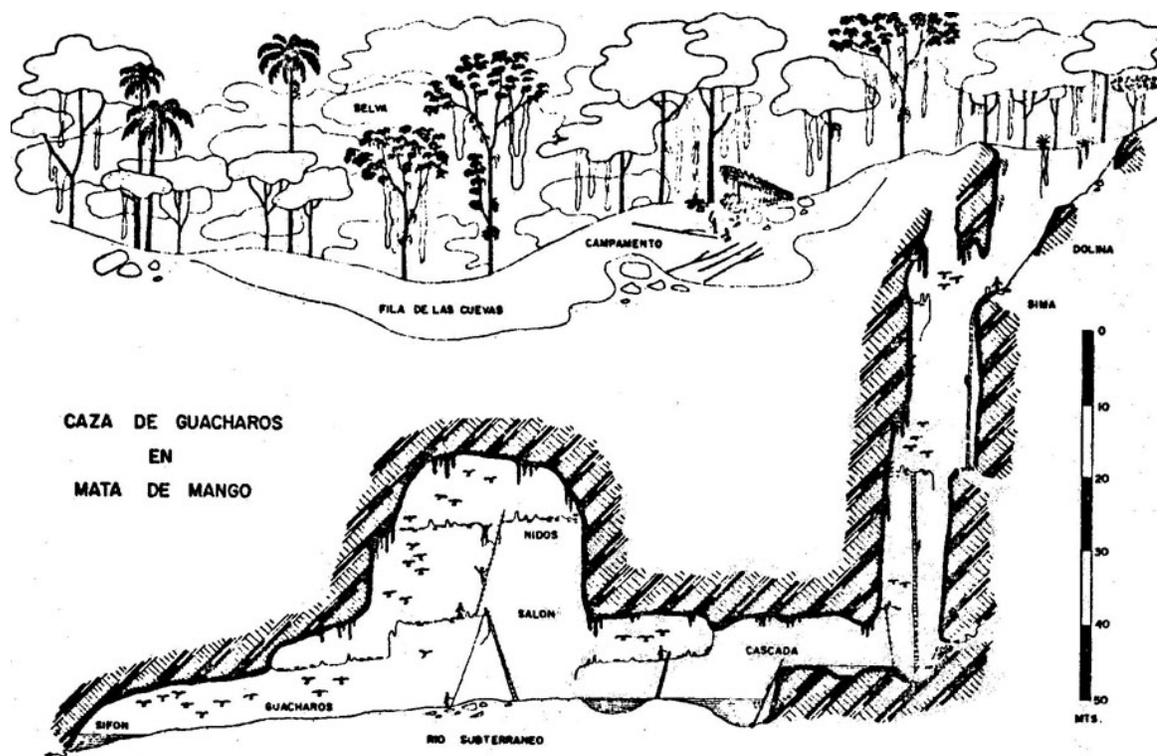


Fig. 5.1. Beatriz and her father, Eugenio de Bellard, in Guácharo Cave, 1984 (Photo by Ramón Alberto Hernández).



- 4.- VARA DE TREPAR SIMPLE.
- 5.- VARA DE TREPAR DOBLE.
- 6.- VARA ATRANTADA CON BEJUCOS.
- 7.- VARAS SUCESIVAS EN ZIGZAG.
- 8.- VARAS SUCESIVAS EN UNA SALA.

- 1.- VARAS PARA SUPERAR ESCALONES.
- 2.- ESCALA DE BEJUCOS.
- 3.- ANCLAJES.



**CAZA DE GUACHAROS
EN
MATA DE MANGO**

Fig. 6.1.a, b, and c. Carlos Galán's sketches of hand-made props used in the caverns of Mata de Mango to hunt for guácharos (Galán 1981:34, 35).



Fig. 6.2. In a 1962 group picture that has become emblematic of a by-gone era, the 8 members of the Speleology Section of the Venezuelan Society of Natural Sciences embody the essence of *the Explorer* (SVE Archives). From left to right: Raúl Alvarado, Eugenio de Bellard, Carlos Bordón, Juan Antonio Tronchoni, Antonio de la Rosa, Dany Adler, Juan Gañán, and Eduardo Schlageter.



Fig. 6.3. Joaquím Astort guides Luz Rodríguez in the placement and reading of the clinometer, Alto de la Palencia, Monagas state, March 2008 (Author's Photo).



Fig. 6.4. Carlos Galán sketches by memory the inner contours of *Sima 2*, Alto de la Palencia, Monagas state, March 2008 (Author's Photo).

Chapter 1

Introduction

In 1967, Oscar Garbisu and Wilmer Pérez spent a month inside Venezuela's Guácharo Cave (Fig. 1.1). Here they are in their underground campsite. Delicate cave formations drape the walls around them. Garbisu rests in a hammock while Pérez works on the scaled version of a map representing the passages they explored and surveyed earlier that day. The place appears flooded with light, but that is because of the photographer's flash that burned with blinding intensity for an instant. Once the eyes readjusted, Garbisu and Pérez only had the flickering light of the gas lamp to go by. Beyond its halo, darkness reigned.

Garbisu and Pérez set up camp for a month in Guácharo Cave to study the physiological effects of a prolonged stay underground. This was Pérez's idea. At the time, he was a medical student at the Universidad Central de Venezuela (Central University of Venezuela). Garbisu, still in high school, volunteered to be a fellow study subject. They also aimed to finish the survey of the cavern, a project that started in earnest in the early 1960s. They did this as part of the recently created Sociedad Venezolana de Espeleología (Venezuelan Speleological Society or SVE). This group was founded in 1967 and as of 2011 remains active although diminished in size and scope. It is dedicated to speleology, or cave science. Its mission has involved exploring anywhere in the country with potential for caves. Once located, caverns are surveyed and mapped.

The maps, along with detailed descriptions, are then published in a national cave registry in the group's yearly publication, the *Boletín de la Sociedad Venezolana de Espeleología* (the *Bulletin of the Venezuelan Speleological Society*). The registry, or cadastre, contains maps and descriptions of over 700 caverns. Once mapped, a cave becomes a space for further speleological research in geology, ecology, hydrology, biology, anthropology, and even, as Garbisu and Pérez would have it, physiology.

These kinds of activities, exploring, surveying, mapping, and creating registries of the resulting information, resemble geographical pursuits that have been key in the formation of empires and nations (Burnett 2000; Carter 1988; Edney 1999; Reig 2006/2007; Winichakul 1994). Maps representing a bounded territory have been critical in this process (Anderson 1991; Craib 2004; Dym and Offen 2011; Olwig 2002; Scott 1998). Geographic knowledge also has helped define and consolidate landmarks as icons of imperial or national identities (Burnett 2000; Carrera 2011; Harvey 2003; Johnson 1995; Radcliffe and Westwood 1996; Reig 2006/2007). In the case of nations, these iconic monuments or parks have been a critical stage upon which ideologies of a supposedly common cultural and natural heritage are crafted, consumed, and sometimes challenged (Harvey 2003; Johnson 1995; Levinson 1998; Ranger 1999; Radcliffe and Westwood 1996; Reig 2006/2007; Withers 2004). Imperial/national geographic projects developed alongside other practices such as botany, zoology, and mineral prospecting (Burnett 2000; Feeley-Harnik 2001; Mueggler 2005a, 2005b; Parrish 2006; Raffles 2002a; Schiebinger and Swan 2005). Scholars have pointed to the blurring of militaristic, economic, and scientific enterprises in imperial and national histories (e.g., Reig 2006/2007). These domains remain entangled today (e.g., Hayden 2003).

What might the quest for geographic knowledge look like at the margins of imperial and/or national projects? What forms might it take in practice? In this study I examine these questions in the context of speleology from historical and ethnographic perspectives. I focus on the Venezuelan Speleological Society, the group that sponsored the 1967 month-long expedition in Guácharo Cave. Based on ethnographic and archival research carried out between 2007 and 2008, I analyze the relations between science, sociality, and landscape. In the case of the Venezuelan Speleological Society, science, with a focus on geographic knowledge, takes the form of survey notes, cave maps, and descriptions that are catalogued in a national registry that the group administers and publishes in its journal. Thus, it is not the state that performs, directs, or even manages speleological research and data. Instead, it is a small group of civilians, mostly friends among them, many not even career scientists, who explore and map caves as an amateur pursuit. They do this in their free time, and mostly at their own expense. In doing so, SVE members appear to be doing the work of the state by revealing a hidden dimension of the national natural patrimony. But are they? What, how, and why is this group taking on this project? What do their activities and motivations suggest about geographic exploration and mapping beyond imperial and state-sponsored territorial pursuits?

For most members of the Venezuelan Speleological Society, cave science is primarily about experience and relatedness: The extraordinary experience of traveling to many regions of Venezuela and exploring and mapping its caves. Many were friends first and speleological partners later. Others forged intense bonds of friendship—even love—while practicing speleology together. As a group that emphasized cave science as a collective pursuit, the Venezuelan Speleological Society created a space for an alternative

science that is not state-directed, professional, hierarchical, nor individualistic. This does not mean that Venezuelan speleology has nothing to do with nation-making and territorial politics. It does. It just means that it is not the main story.¹ We must look elsewhere.

Let's return to Garbisu and Pérez deep in Guácharo Cave. Had we been there, we would have had to get nearer to see what they were doing. Moving in the cavern's irregular inner surface would have required much care. The lantern's limited reach would have demanded more intimacy. And silence. What might have we heard? At that moment their Beatles cassette tape was enjoying a much-needed rest. We might have heard the soft trace of the pencil on the drafting paper as Pérez worked on the cave survey. Casual conversation between the two was most likely about girlfriends and not about their contributions to Venezuela's speleological patrimony.² Garbisu had just broken up with his sweetheart. To make matters worse for him, Pérez could hardly contain his excitement about his new girlfriend, Mirza Pesquera, whom he met in medical school back in Caracas. He talked about her constantly. Garbisu teased him.

Pesquera convinced her family to travel to Caripe, Monagas, to pay a visit to her boyfriend during his 30-day underground stay. Along with her brother, sister, her

¹ It rarely is. Even in cases where geographical pursuits are part of imperial or state projects, experience—with the landscape, with other people, and even with the tools and technologies that make the work possible—always is an important part of the story of how scientific knowledge is produced. Arguing this point, a number of scholars caution against the assumption of empires and states as monolithic entities capable of structuring and dominating every form of engagement among humans and the landscape (Burnett 2000; Carter 1988; Edney 1999:25; Mueggler 2005a, 2005b; Raffles 2002a, 2002b). By focusing on activities on the ground, the quest for geographical and other forms of knowledge that have been deemed crucial in the articulation and imagination of imperial and state power turns out to be much more nuanced and complicated than one might first assume (Burnett 2000; Carter 1989; Edney 1999).

² This is based on Wilmer Pérez's recollection of this event (Pérez, Personal Communication, December 30, 2011).

boyfriend, and cave guide Benjamín Magallanes, she made the kilometer and a half trek through the mostly horizontal cavern to reach the subterranean camp. At one point she had to submerge herself almost completely in the cave's inner river to cross the infamous *Paso del Viento* (Wind Pass). During the dry season, the spot spares only a few centimeters of breathing room just under the passage's low ceiling. Meanwhile, Pérez was jumping with excitement, expecting her arrival to his camp at any minute.³ The cavern's caretaker, Ramón Salazar, had called the speleologists underground to inform them of the visitors' arrival. He used a phone line that connected his home just outside of the cave entrance with the camp. It was set up for the purpose of the 30-day mission. The phone was SVE president Juan Antonio Tronchoni's idea. Tronchoni, almost 20 years their senior, cared for the young explorers as if they were his kids. With the entry of more young members to the group, he soon gained the nickname "Papa Juan." Most SVE explorers that joined the Society during the 1970s and 1980s still remember him by that name.

Pesquera brought with her two cans of tropical fruits in syrup. Pérez didn't open them for several days after her departure because "she had touched them" (Pérez, Personal Communication, December 31, 2011). Garbisu, a Marxist (or a hungry and envious friend?), complained that he was fetishizing the cans.⁴ Desire to munch on the sweet treats eventually gave way. Recalling this episode, Pérez joked that had his girlfriend given him empty Coke bottles, he would have "placed them at the entrance of the cave next to lit candles!"

³ This is based on SVE member Fernando Enrech (Enrech, Interview, January 4, 2008). He was visiting the Guácharo Cave underground campsite to bring more supplies at the moment that the explorers got the call announcing the visitors' arrival.

⁴ Garbisu went on to study anthropology in the Universidad Central de Venezuela.

Fruit cans turned fetishes, a phone line connecting the two young men to the world beyond the cave, a Beatles tape, muddy boots, the flickering gas lamp, and that map...that representation in the making, the result of bodies moving in coordinated rhythm with their tools through the cavern's inner passages. The production of geographic knowledge—illustrating science in practice more generally—must be understood as part of these rhythms. These are rhythms not just of bodies and tools in and with place but of all things—both tangible and not—that make scientific practice possible, giving it meaning and nurturing into the future.

This project builds on studies that have emphasized the material, affective, and relational qualities of scientific pursuits, including those done in imperial contexts (Burnett 2000; Carter 1988; Mueggler 2005a, 2005b, 2011; Raffles 2002a). It then considers the implications of these perspectives on three questions that have received limited attention in the academic studies of science. First, what nurtures and sustains *over time* collaboration among diverse actors in a scientific pursuit? Second, what brings these diverse actors together in the first place? And third, what might push them apart? These are special problems for Venezuelan speleologists, who do cave science mostly as an amateur pursuit.⁵ As I have already noted, they do not get paid for what they do. They practice speleology in their free time. Thus, neither salary nor professional prestige appears to be the main motivators here. Moreover, what happens to the knowledge they produce? How does it become accepted and disseminated as scientific knowledge?

⁵ This is true of most speleologists around the world, although there are some exceptions. Moreover, the picture gets complicated in the case of speleologists who are professional scientists in fields such as geology or zoology. In these cases, there may be some overlap between speleology and their fields (see Chapter 3). See also Sarah Cant's analysis of British speleologists (2006).

On this last count we know the important role that norms and techniques, such as methods standardization, play in the simplification, translation, and objectification of knowledge (e.g., Latour 1989, 1999; Leigh Star and Greisemer 1999[1989]; Mol 2002). Attention to these norms and techniques, alongside the qualities of tools and products of standardization (e.g., files, measuring equipment, maps, graphs), helps us understand how diverse actors collaborate in a common pursuit while ensuring the integrity of their science (e.g., Leigh Star and Greisemer 1999[1989]). Interestingly, these studies show that all actors need not achieve consensus to get the work done. Moreover, the resulting knowledge does not even have to *be the same thing* to all people (Mol 2002)! We also know of the key role that morality plays in the judgment of this integrity (Shapin and Schaffer 1985; Shapin 1998, 1999[1988]). Not everyone can witness an experiment or a curious specimen in the field. How do we trust the integrity of scientific knowledge produced/collected elsewhere by others? On this point, the judgment of individuals' moral character is key (Shapin and Schaffer 1985). Even with the modern invention of signs of expertise (e.g., degrees, licenses, refereed journals, conflict of interest statements), trust plays a role, since we have to trust these markers of expertise (Shapin 1998:8).

In this project I emphasize the relational, affective, and experiential qualities of scientific practice. I argue that along with norms and trust, affect and experience (both the result of people's relations among themselves, to place, and to things) are important to understand the how and why of science. Moreover, they are important to understand people's *commitment* to each other and to science over time. This perspective gives us intriguing insights into why some collaborations work and others do not.

Something else happens when we focus on these relational, affective, and experiential qualities of scientific practice. Studying activity in spaces of science, whether laboratories or the field, is not enough. Doing so cuts off important relations that spill beyond these spaces that help sustain science in the first place. These relations—of kinship, of friendship—take us beyond the field and laboratories to basements, homes, and personal libraries where objects of science—such as tools, maps, specimens, and field notebooks—expose a broader, more intimate, and also more dynamic “geography of science” (Livingstone 2003).⁶ From this vantage point we better understand how and why people come together and maintain scientific endeavors. We also learn how these endeavors and the knowledge they produce become meaningful to people’s lives.

In my analysis the Venezuelan Speleological Society comes into being and is maintained over time by the moral and affective relations that speleologists have forged in and with the cave landscape, both above and below ground. Above ground, this landscape includes others spaces beyond the field site. Most of these places are real, such as the many buildings that the group rented before settling into the basement of a residential building, restaurants, and members’ homes. Some are imagined, such as the spaces that the group hoped it could create but never did, such as its own research laboratory, museum, and even a center near Guácharo Cave in Monagas State. Thus, this project proposes opening up the spaces of science by emphasizing their interconnectedness and even overlap with a broader geography of intimacy and

⁶ To David Livingstone, a geography of science examines “how scientific knowledge bears the imprint of its location” (2003:13). This examination is warranted because all dimensions of scientific practice, including the circulation of scientific knowledge, “have spatial dimensions” (2003:12). In my project I build on Livingstone’s proposition of the spatiality of science, but do so by questioning what we might assume to be spaces of *science* prior to an ethnographic investigation of a broader geography,

relatedness. By a geography of intimacy and relatedness I mean, simply, all of those spaces occupied and carved out by the rhythms and attachments of everyday life, of which, for many, scientific practice is a part.

In a broader sense, then, this is a story about the ways people create meaning, and strive to have that meaning endure. This is an unusual perspective from which to consider scientific practice. I argue, however, that it is a necessary and productive perspective since it opens up scientific practice as one of many ways in which humans strive to build relations among one another and explore the world. In anthropology we understand that this is about people thinking, saying, and doing things together in and with place (e.g., Feld and Basso 1996; Ingold 2000). We know a lot about these dynamics in the context of habitual practices. But we know less about how place becomes meaningful to people as they explore and experience *new* places in ways that are less predetermined. I think this is because even considering the possibility of “newness” might imply separation between humans and the world. And this separation, this estrangement, is what scholars who emphasize the “being-in-the-world” quality of human experience are arguing against (Csordas 1994; Gibson 1979; Ingold 2000:166-171; Feld and Basso 1996; Jackson 1996; Macpherson 2010; Merleau-Ponty 2005[1945]; Stoller 1995; Thrift 1996).

On another front, to speak of exploration and discovery ushers in a whole other set of tropes and stereotypes, such as imperial explorers who objectify and exploit nature, on the one hand, and tourists consuming a prepackaged experience, on the other (Pratt 1992; Vivanco and Gordon 2006).

In my work I propose other interpretations. To the Venezuelan speleologists, places become meaningful not only through the embodied and even poetic experience of

exploration and the collective efforts it entails, but also by using and making maps. With this I emphasize the affective qualities of scientific practice not only as emplaced but also as embodied in material artifacts that gain rich social lives beyond their specific identity and use *as* objects of science (Appadurai 1986; Mueggler 2005; Raffles 2002). This approach to maps and map-making is an important contribution to academic studies of cartographic practices (Cosgrove 1999). These studies typically focus on maps as either imperial or state technologies of power or as effective tools of resistance against imperial or state encroachment into the lives and spaces of disenfranchised communities (Anderson 1991; Craib 2004; Olwig 2002; Peluso 1995; Radcliffe and Westwood 1996; Scott 1998). Venezuelan speleological practice fits neither category, since it neither works for the state nor counters it with territorial claims over the spaces it explores and represents. In my study cave maps are representations of spaces/objects of science that highlight a hidden aspect of the national natural patrimony. But in practice, they are, above all, the material instantiation of a collective effort that honors particular affective and moral bonds of relatedness among people working together in and with place.

Even as I open up the geography of science to include other spaces beyond the laboratory or the field, I do not lose sight of the peculiar qualities of each. Indeed, understanding speleology is impossible without appreciating the characteristics of caves as sensuous, hidden, and ambivalent spaces that resist being revealed and bounded. Cave landscapes force a radical multidimensionality to our appreciation of space. Their exploration demands thinking of space along multiple planes, but also across time. This is true of any space (Massey 2005). Caves, however, bring this abstract notion to the forefront of human engagements in the world. One reason for this is that there is no

technology that can accurately map a cave from the surface. Even locating caves poses dire challenges to existing technologies. This remains true today, just as it did for Oscar and Wilmer in 1967. One must enter a cave to explore it, map it, and thus construct a representation of the enclosed space. This representation, in turn, enables the explorer to situate himself within what is often a maze of winding and overlapping passages. These practices grant an anachronistic second life to exploratory activities that scholars have dismissed as a thing of the past (Gordon 2006:1). This fact offers a unique opportunity for an ethnographic inquiry of exploratory and cartographic practices in the field.

Caves are distinctly polyvalent, charged with intense symbolic and material qualities that come into being as human bodies traverse their passages (Aitken 1986; Eliade 1962; Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990; Shortland 1994; Williams 2008). These are not spaces of dwelling or habitual practices, thus calling on theorizations of space that consider intense human encounters with unfamiliar and even disorienting places (Aitken 1986; Cant 2003; Ness 2011; Yusoff 2007). By considering caverns as spaces of exploration, as objects of science, this study broadens the range of human-cave relations (Bonsall and Tolan-Smith 1997a; Brady and Pruffer 2005a). In the context of Venezuela, this also means considering speleological activities alongside and in relation to other cultural (indigenous, folk) practices that center around caves (Perera 1988).

The Venezuelan Speleological Society is a scientific organization that is neither professional nor state-sponsored. This fact, along with its autonomy, makes it an exceptional in the case of Venezuelan science (Díaz, Texera, and Vessuri 1983; Vessuri 2005). Indeed, the SVE resembles the kinds of civic science societies that Withers and

Finnegan describe in the case of Scotland in the 19th century (2003). This is a novel perspective from which to examine Latin American science, which has focused primarily on individual personalities (typically although not exclusively on Europeanized elites), imperial projects of expansion, and religious and/or state efforts to promote republican modernist ideals (Cañizares-Esguerra 2005, 2006; Pratt 1992; Saldaña 2006).

The fact that speleological activities take place in Venezuela, with a focus on Venezuela's underground no less, begs the question of how they compare to what we already know of society and nature in Venezuela.⁷ We know of the key role that underground wealth has played in the consolidation of the modern state (Coronil 1997). Speleology, however, does not appear to reveal a parallel world of underground wealth. First, despite early efforts by some speleologists, the state has shown little interest in caves. Caves are “empty” in the eyes of those focused on the underground as a large-scale and undifferentiated source of mineral wealth. Second, even if we think of the speleologists as doing the work of the state by surveying caves, this does not translate into appropriation or exploitation of these spaces... or at least not yet. In my work I suggest ways this could change. Yet, I think that speleological practice points to unexplored ways citizens may reconfigure and even challenge state-orchestrated relations between nature and nation. Thus, this study presents an ethnographically grounded case of human experience, production, and imaginings of alternative national geographies, their histories, and futures.

⁷ As part of the nation's underground, caverns are national patrimony. In contrast to places like the United States, where a private owner's topsoil rights extend to the underground, in Venezuela they are only surface-deep (although there are complex legal exceptions in both cases).

Introducing Speleology

According to speleology historian Trevor Shaw, "the overlapping of the scientific fields of geomorphology, geology, biology, geography and exploration, together with history, and focusing them on caves best represents speleology" (Cant 2006:780; Shaw 1979).

Thus, it is most appropriate to think of speleology as the interdisciplinary scientific study of caves. This includes studying caves *themselves* as geomorphological spaces (their dimensions, their origins, etc.), what they *contain* (flora, fauna, minerals, archaeological artifacts, etc.), and their *connectedness* to the broader landscape (their hydrology, geology, etc.). *Karst* is the term attributed to such a landscape (Ford 2004). Basic to all speleological pursuits, then, is studying this landscape, and specifically, locating, exploring, and mapping caves. As I have already noted, there is no technology that can accurately map a cave from the surface. One must enter a cave to explore it, map it, and thus construct a representation of the enclosed space. This makes speleology a distinctly "sporting" scientific pursuit (Cant 2006).

The historical development of speleological knowledge parallels developments in cave exploration (Shaw 1979). This begins with the embrace of an epistemological stance grounded on first-hand experience: the idea that only through "direct" experience, by observing nature in its "natural state," does it truly and more fully reveal itself (Cant 2006:779; Hevly 1996; Secord 2002). French speleologist E.A. Martel (1859-1938), who is widely regarded by the international speleological community as a key promoter of the science, ardently espoused both aspects of speleology: the exploratory "sporting" and "scientific" sides (Cant 2006:779; Shaw 1979:61). For him, sports and science came together at the map (Chabert and Watson 1981:3).

Not only are the tools and techniques necessary to survey a cave relatively accessible, economical, and practicable (at least when compared to the technologies necessary to explore other geographical “frontiers” such as deep oceans and space), their accurate use depends on a team effort. This fact, combined with the appeal of cave exploration ranging from the explicitly scientific to the adventurous, typically results in a mixed group of practitioners. This diversity characterizes other field sciences (Kuklick and Kohler 1996). Moreover, speleology remains primarily an amateur science. Only very few states or academies promote speleological study as a professional and/or academic pursuit. Thus, most speleological societies and clubs are made up of a mix of career academics (typically geologists, biologists, archaeologists) and non-academics who practice speleology as a “serious hobby” (Stebbins 2007).

Human geographer Sarah Cant has examined the field and institutional dynamics of British speleology between the 1930s and 1950s (2006). She argues that the sporting aspect of speleological practice both contributes to the diversity of its practitioners and to tensions among them as they struggle to define the objectives as more or less scientific. Addressing precisely how this plays out in the context of Venezuelan science is one of this dissertation’s main tasks.

As is to be expected in communities of practices struggling to define its blurry boundaries, different terms arise to define different kinds of practice. The proliferation and use of terms also abides to cultural and historical contexts. Here I offer a brief contrast between the Venezuelan and U.S. cases.⁸ I will start with the case of Venezuela,

⁸ Although my dissertation fieldwork centered on Venezuela, much of my speleological training took place in the United States. I return to this point when I describe the project’s methods and scope.

or more specifically, the SVE, which, from its beginnings, has strived to define itself as a *scientific* society. Their embrace of the term *espeleología* (speleology) signals this stance. An *espeleólogo* contrasts to an *espeleista* (among SVE members, this is typically a derogatory term). *Espeleista* does not have an exact translation in English. Depending on context, it might translate into "spelunker," the term current U.S. cavers use to describe an individual who visits caves with very limited experience and often, disregard towards conservation. But *espeleista* can also translate into "sports caver," a genre of cave enthusiast that is experienced and skilled in exploratory techniques. Sports cavers focus on cave discovery and record-breaking, such as exploring the deepest or longest caves in the world. Such individuals still rely on cave surveys to find their way and claim their achievements (where they have been). Thus, many sports cavers are skilled surveyors themselves, or rely on those who possess those skills within their exploratory teams.

The term "speleologist" is less prevalent within the U.S. caving community. Most self-identify as "cavers." Still, there is much slippage among these terms and their meanings. This fact signals the diversity of activities that characterize speleology as a sporting-science (Brucker and Watson 1987; Cant 2006; Schaper 2003). In this dissertation I will use the terms "caver" and "cave explorer" interchangeably to describe people who explore caves. I have heard some Venezuelan cavers use the term *cuevero* (the literal Spanish translation of "caver"), but it is usually done so casually, not as a serious self-descriptor.

One of the key arenas in which the boundaries of speleological practice have been debated is how to properly survey and map caves. Interestingly (but hardly news to

historians and philosophers of science), how caves are defined has been a contested issue (see Curl 1964 for an early discussion of this). As Ukrainian speleologist Alexander Klimchouk notes, a cave's definition is necessarily

anthropocentric, [since it] relies on the ambiguous criterion of accessibility by man, has no genetic meaning, and is therefore non-scientific. It also implies that a cavity is connected to the surface through entrances. Caves can be distinguished from surface landforms by morphometric criteria: caves are forms in which the long dimension (length or depth) is greater than the cross-sectional dimensions at the entrance. The anthropocentrism of the above definition of a cave implies that it is largely air-filled, but advances in underwater cave exploration during the second half of the 20th century have dramatically relaxed this limitation. The concept of a cave, is, rather, an exploration notion. [2004:203]

Less interested in static categorizations of what caves are or are not and what a speleologist is or is not, I prefer to think of caves and explorers as mutually constituting in practice. This means thinking of each as process or "event" (Massey 2005; Rose 2002). In this view,

[L]andscape is no longer understood as simply being an inert background or setting for human action, nor is it understood as solely a pictorial or discursive form of representation. Rather, landscape ... comes into being by drawing variably on embodied, material and discursive domains. [Macpherson 2010:6]

Within various caving communities around the world, debates have and continue to rage regarding proper ethics of exploration, debates that further challenge a cave's "naturalness." When is it "proper," if ever, to physically enlarge a cave entrance or passage to permit further exploration?⁹ What about abandoned mines that take on the ecological properties of "natural" caves such as when they become colonized by bats?

⁹ The relevance of this particular issue varies across caving cultures, and across time. I have not been able to confirm any cases within the history of the Venezuelan Speleological Society in which this was ever an issue. In the United States, however, the rise in incidences where caves are artificially altered to allow for further exploration is a growing concern.

Should they not be explored and surveyed as well? Must caves be counted only when they are the result of the process of dissolution in limestone rock, as opposed to, for example, caves formed from mechanical processes such as rock breakdown? This dissertation analyses, both from a historical and ethnographic perspective, how variously positioned actors, speleologists and non-speleologists alike, have addressed these questions, both discursively and in practice. This dissertation's central contention is that relevant discourses and practices must be considered dialectically as they relate to human engagements with the peculiarities of the cave landscape while at the same time not cutting caves off from a broader geography of science.

A Brief History of Speleology

The term *Höhlenkunde* is the first to refer to a consolidated field of cave study of science. It first appeared in an 1850 paper presented to a learned society in Vienna, and is still used in German today (Shaw 1979:2). The coining of "speleology" is attributed to prehistorian Emile Rivière. E. A. Martel used the word and first presented it in a paper at a meeting of the Association Francaise pour l'Avancement des Sciences in 1894 (1979:2).¹⁰

¹⁰ The question of how and why caves should exist at all, however, has intrigued humans well before the formalization of speleology or even geology as a discipline (Shaw 1979, 2000). Some explanations included the belief that they were man-made or that they resulted from the expansion of gases from decomposing animals that died in the Biblical Floods. Catastrophists extended to caves the same thesis they applied to other landforms: violent tectonic movements of the Earth's crust shaped the contours of the planet, both above and below the surface. The effects of water eroding, enlarging, and shaping fractures in the bedrock remained central to uniformitarian explanations. In contrast to the catastrophists, however, they allowed a longer timeframe for water currents to cause these transformations (Shaw 2000:22-23). It was not until the end of the 19th century that the impact of water as agent not just of erosion but also of *dissolution* was acknowledged.

Before the formalization of speleology in the late 19th century as a recognized scientific pursuit, caves already played an important role as places of science (Shaw 1979; 2004). This is due to their quality as valuable repositories of well-preserved clues to the past. Archaeology originated from the systematic study of remains found in European caves during the mid 19th century (Shaw 1979:345). In many cases, these remains were critical in the dramatic debates regarding understandings of the past (Rudwick 1989:243-245; Shaw 1979:362).¹¹

The study of cave art also stirred passionate debates regarding their symbolism and impact on understanding of human antiquity. By the end of the 19th century, a growing number of accounts of paleolithic cave art garnered enough acceptance and interest to propel their study, first in Europe, but then elsewhere, in every continent except Antarctica (Bednarik 2004:85).¹² Interestingly, much of this imagery is located

Shaw attributes this to “more detailed and more precise examination of caves at the time” (2000:23). In fact, most caves in the world are primarily the result of the more or less steady process of dissolution of (usually, but not exclusively) limestone by acidic water. A precise understanding of this mechanism was not achieved well after oxygen was discovered in the 1780s.¹⁰ In 1830, two scholars independently published statements on the role of carbon dioxide in cave formation, Charles Lyell and Charles Edouard Thirria. Thirria, who was a mining engineer, also explored and surveyed many caverns in his native France. He encountered underground features (stalagmites and stalactites) that could not be explained any way other than by the dissolutive power of acidic water (Shaw 2000:26).

¹¹ For example, for Georges Cuvier (1769-1832), materials derived from caves formed the basis of his formulations of comparative anatomy (Shaw 1979:362). The excavation of flint tools, together with the bones of extinct species from Brixham Cave in Devon, England, precipitated Charles Lyell's rethinking of geological time in favor of a lengthened geological chronology (Trautmann 382:1992).

¹² Explanatory paradigms have gone through a number of shifts in the discipline's history, with the view of simple and primitive art forms moving towards more complex ones dominating the field well into the 1990s. In 1995, archaeologist Robert Bednarik refuted this linear evolutionary framework with his work in Chauvert Cave in France. Direct dating techniques proved that in this site, the most sophisticated imagery preceded the simpler forms (Bednarik 1995).

well beyond shallow rock outcrops and cave entrances. These cases have prompted a consideration (often speculative) of why humans delved deep into caverns (Bahn 2004). As I will highlight further on, incorporation of cave specialists in the study of cave archaeology dramatically expanded and strengthened these analyses and interpretations (Brady and Prufer 2005a).

The appreciation of caves as natural laboratories also preceded the formalization of cave science, or speleology. Charles Darwin (1809-1882) pointed to the special adaptation of cave fauna to their relatively stable environments as important evidence of evolution (Shaw 1979:345). More recently, climate scientists have been studying stalagmite core samples in an effort to reconstruct the earth's climatic history. Deep caves also have yielded "extremophiles," organisms (mostly microbes) that survive in extreme environments inhospitable to humans (Taylor 1999:16).

Since the early 1600s, interest in mineral resources, waste management, and water sources promoted systematic regional exploration of caves, particularly in Eastern Europe, where so much of the landscape is karst (Shaw 1979:19). One of the common characteristics of karst landscapes is that much of the fresh water resource is underground, since the porous earth cannot hold it on the surface. This is a challenge for underground miners keen on keeping their shafts from flooding. Finding nearby caverns also "solves" the problem of dumping waste (this "solution" often results in the contamination of fresh water sources). Thus, karst landscapes pose unique challenges to those eager to channel water or build dams (Shaw 1979:31). Other utilitarian uses that fueled the exploration of cave systems included the exploitation of a unique resource contained therein (such as the nitrate-rich bat guano used to produce gunpowder and

fertilizers) and the development of caves for tourism (Hamilton-Smith 2004; Shaw 1979:365).¹³

The success of geological and hydrological reconnaissance efforts depended on situating caverns in relation to the broader landscape. Caves had to be accurately described and mapped. This required a systematic exploration in the field and the consolidation of speleological knowledge of a region. Czech (then Bohemian) Adolf Schmidl (1802-1863), who carried out the majority of his research in the karst region of Postojna Cave in Slovenia, Austria, and Hungary, was the first to conceive of cave studies as a unified area (Shaw 1978:253). Among his key contributions were his emphasis on a regional cadastral project, his use of cave maps (made by his companion Ivan Rudolf, who was a mining engineer) superimposed on a surface relief map, and his general attitude towards underground exploration that led him to discover extensive underground systems (Shaw 1978; 1979). In other words, he was both a scientist and a sportsman.

Édouard Alfred Martel (1859-1938) also was key in the development of speleology. A lawyer by training, his enthusiasm for nature and science, his extensive travels both in Europe and in North America, and his initiative in founding speleological societies and spurring the production and circulation of speleological publications earn him the descriptor of the “founder of international speleology” (Shaw 1979:385). He emphasized speleology as a “sporting-science,” and hoped that its adventurous quality would attract many (Cant 2006: 775; Chabert and Watson 1981; Shaw 1979).

¹³ There are many other intriguing cases of utilitarian cave use. Caves in Indonesia and Malaysia were exploited for the valued edible nests of their bird in residence (Shaw 1972:72). Even earlier still, some indigenous communities trekked into caves to scrape minerals off the walls that they used as nutritional supplements (Watson 1974).

The appearance of exploration societies was fundamental for the further development of speleology. Their appearance followed closely the popularization of scientific societies and the growth of tourism in 19th century Europe, particularly England. While some short-lived groups originated in Switzerland in the early 1860s, speleology groups have existed continuously since 1879 (Shaw 1979:380).¹⁴ To Shaw, these societies were critical for three reasons:

They bring together people with similar interests, stimulating deeper and longer-term involvement in the field; By working together as a group, the members are able to undertake explorations that are technically more difficult and physically more demanding than those they could have done alone; Their specialist cave publications not only increase the amount of speleological material publish, but make it more readily available to people who have an immediate interest in it. [Shaw 1979:380; 2004:350]

Since the early 20th century, the number of speleological groups has grown dramatically. Many of them are devoted primarily to the sporting aspects of caving. Many others embrace cave science, thus promoting an agenda of exploration, surveying, and speleological study of karst phenomena. Interestingly, “the motivated and progressive societies that achieve research results, both in exploration and cave study, are still similar in nature to those of 100 years” (Shaw 2004:350). National and international bodies have sprung up, bringing together speleologist from across the world. In 1941, the National Speleological Society was founded in the United States, and it is now the umbrella organization of more than 250 caving clubs, or “grottos.” In 1965, the International Union of Speleology (UIS) was founded, and has since held international congresses every four years in every continent except Africa and Antarctica.

¹⁴ Martel founded in 1895 one of the most influential in world speleology: the French Société de Spéléologie. Its publication, *Spelunca*, has been in production and circulation almost continuously since then.

Representatives of speleological groups from the Caribbean and Latin America came together to form the Federación Espeleológica de América Latina y el Caribe or FEALC (the Speleological Federation of Latin America and the Caribbean) in 1983.

In Latin America and the Caribbean, the scientific and cartographic investigation of caves began prior to the institutionalization of speleological practice in the form of societies and expedition clubs, beginning in the 1930s in Mexico, Cuba, and Brazil. Interest in resource use and extraction often preceded and/or spurred such investigation. Extraction of nitrate-rich bat guano for gunpowder production from caves was an important activity in some areas of the limestone-rich Caribbean basin and in Brazil during the colonial period and beyond (in Brazil it went on into the 20th century) (Auler 2004:60). In Venezuela, the chemist Vicente Marcano explored many caves in the recently independent nation during the 19th century. The search and possible commercialization of bat guano for fertilizer was an important driver (Urbani 1984). Marcano is one of several key figures in the development of speleology in the region (Auler 2004).

Alexander Humboldt and Aimé Bonpland visited Venezuela's Guácharo Cave in 1799. They explored 422 meters of the cavern, which Humboldt later described in his popular publications following his travels (Humboldt (1966[1817]); Urbani 1999).¹⁵ From 1834 to 1844 Danish naturalist Peter Wilhelm Lund and the Norwegian Peter Andreas Brandt explored many caves in Brazil's Minas Gerais state in search for fossil bones. Brandt surveyed many of these caves (Auler 2004:59). In 1851, Father Romualdo

¹⁵ Chapter 2 offers a more detailed history of exploration of this cave.

Cuervo descended in a basket the 120 m vertical shaft of Colombia's Hoyo del Aire (Auler 2004:60).

In Venezuela, the practice of organized speleology began in 1952, with the founding of the Speleology Section of the Venezuelan Society of Natural Sciences. This group would go on to form the independent and autonomous Venezuelan Speleological Society in 1967. The group remains active to this day.

A few notes about this very brief history of speleology: In general, speleology remains a relatively marginal science. This is true in two senses: It is a field activity that takes place, literally, in a geographical frontier, in geological spaces that often humans have never entered. Moreover, caves' typically hidden, inaccessible, and sometimes inhospitable qualities generally preclude them from being highly recognized and valued landscape features. Only a few countries in the world have government-sponsored programs dedicated to the exploration, survey, and/or conservation of their karst resources (Australia, some European countries, Brazil, Cuba, and to a more limited extent the United States are exceptions to this). Even in these cases, the task of exploration, survey, and even management of nation-wide cave registries (if they exist) often is the domain of civic and autonomous groups, themselves rarely having any affiliation with academic institutions.

This goes hand in hand with the second sense in which speleology is a marginal science: In general, speleology has not achieved the institutional stature of other established academic disciplines such as archaeology, geology, or biology. While explaining the precise reasons for this requires broad research and analysis beyond the scope of this work, I will address the topic in the case of Venezuela throughout this work.

Finally, a “brief summary of speleological history” belies the fact that there are many speleological histories. Indeed, emphasizing “key players,” “important caves,” “the first and oldest and most accurate maps” reaffirms or echoes patriotic and even colonial narratives of scientific development and exploratory prowess. Critical scholars have given us good reason to question stories that present “science” (or capitalism, romanticism, nationalism, etc.) as originating in Europe and then “spreading” to the rest of the world (e.g., Anderson 1991; Cañizares-Esguerra 2006; Mintz 1985; Ortiz 2001[1940]; Wolf 1982). While “de-centering” the history of world speleology is beyond the scope of this project, I trust my analysis of the Venezuelan case will help shift perspectives, both below and above ground.

Broadening the Historical and Cultural Examination of Human-Cave Relations

Of course, the story of speleology is not just a story about science in and of caves. This is one of the key points I make in the case of Venezuela. It is also the lesson learned as we take a broader and deeper view of history. As sites of refuge, ritual, art, and exploration, caves hold a special place in human history and culture (e.g., Bonsall and Tolan-Smith 1997). Their uses and meanings have been and remain multiple, challenging typologies that attempt to characterize such uses and meanings. Only recently speleologists have transformed caves into objects and places of scientific study (although, as I will argue throughout my work, this transformation does not necessarily displace other powerful “non-scientific” experiences and meanings of place). An appreciation of this last transformation requires placing it in a broader historical and cultural context of human-cave relations.

A number of scholars (some speleologists among them) have put forth typologies of human-cave relations. These typologies have included both “utilitarian” and “non-utilitarian” uses of caves (Bonsall and Tolan-Smith 1997; Thompson 1959).¹⁶ Yet, archaeological attention to caves as important features of indigenous cosmology was, until recently, very limited (Brady and Prufer 2005b). When it did appear, functional assumptions dominated interpretations, with habitation as the most common conclusion.¹⁷ Within U.S. archaeology, important paradigmatic shifts of how human-cave relations were studied and understood occurred among Maya archaeologists since the 1960s (Brady and Prufer 2005b). Appreciating caverns not simply as backdrops or concepts but as complex phenomena integrated to the broader physical and ideational landscape was critical for these shifts to occur (e.g., Heyden 1975; MacLeod and Puleston 1978; Pohl and Pohl 1983; Thompson 1959; Brady and Prufer 2005b). How did this happen? By getting into caves and involving cavers and speleologists in the process of field research (Brady and Prufer 2005b:6). This marks a key break from “earlier interpretative work, [characterized by] writers using folklore, iconography, ethnohistory, and ethnography [which] tended to deal with the concept of the cave rather than with any physical reality” (Brady and Prufer 2005b:7). It also underscores a critical underlying theme of this present

¹⁶ Among the only volumes to treat the subject in a cross-cultural and comparative manner is Clive Bonsall and Christopher Tolan-Smith’s *The Human Use of Caves* (1997). Its 28 contributors not only acknowledge the relevance of caves in human history and culture (something others had done before), but go beyond most previous investigations to ask: “‘What were humans doing in a cave in the first place?’” In other words, they focus on human engagements with and in caves, instead of just treating them as backdrops to their activities, or even symbolic spaces in an ideational landscape.

¹⁷ According to Brady and Prufer, habitational and utilitarian interpretations of human cave use dominated the archaeological literature well into the 1990s (2005b:3).

project: the need to treat caverns not as context or backdrop but as active players in the making of place, the production of knowledge, and the forging of sociality.

Just as the involvement of cave specialists has greatly enriched research in Mesoamerican cave archaeology, comparative knowledge and expertise of cave space garnered through extensive fieldwork informs some of the most interesting and imaginative scholarship on cave art. As Clayton Eshleman argues in *Juniper Fuse* (2003), his exploration of the meaning of Upper Paleolithic cave imagery, theoretical attempts to explain *cave* art ought to consider the *experiential* character of caves. This requires, as Brady and Pruffer also argue, moving from a treatment of caves as concept to physical reality (2005b:7). But with Eshleman, treating caves as “physical reality” falls short of the complex dynamics that characterize cave landscapes. Encounters with/in caves are not just about encounters with stone. Movement within underground passages, assuming the explorer has a light source, involves shifting patterns of light and darkness. Shadows texture visual perceptions of place. Sound (or the lack thereof) also charge cave encounters in ways that threaten (and often succeed) to overwhelm the senses and excite the imagination. In other words, to think of caves as a “physical reality” requires considering the layered qualities of stone, lightscapes, soundscapes, and even imagined topographies, as they are encountered, in movement, by the prodding body (Bille and Sørensen 2007; Helmreich 2007). This “reality” comes into being by grasping moving bodies in and with space, bodies that don’t just move, but, like Garbisu and Pérez, think, dream, and even love.

Human-Cave Relations in Venezuela

Venezuelan Miguel Angel Perera, who first approached the Venezuelan speleologists right before the formation of the SVE in 1967, began to study human cave use during outings with his caving companions when he was a teenager. Perera is credited for establishing the nation-wide systematic study of past and present human cave use (Scaramelli and Urbani 2006). In 1988, he published in the *Boletín de la Sociedad Venezolana de Espeleología* an article that summarized twenty years of labor towards what he called “historical speleology,” as opposed to the often used terms “prehistoric speleology” or “speleoarchaeology” (Perera 1988:18). In this article he argues that “historical speleology” better includes the breadth of past and present human cave use in Venezuela, arguing for a theoretical framework that rejected a categorical break between past and present. He summarized that breadth thus:

(a) Caves and rock shelters with cultural material remains of precolombian amerindian groups of different epochs. In essence, that which is specifically speleoarchaeological. (b) Amerindian groups that continue to use caves for purposes similar to those of their ancestors and other ethnic groups currently nonexistent; representing authentic cultural relics, sometimes featuring evidence of cultural syncretism. (c) Isolated creole groups, peasants of strong indigenous [*riagambre*], that use caves for religious means during old traditional rituals or for periodic capture of their particular animal resources. (d) The cult which important urban and rural sectors of the population, mainly in the center of the country, have for María Lionza o María la Onza, popular deity and expression of a dynamic cultural amalgam in which caves, as sacred spaces, play a significant role. [Perera 1988:18]

Perera describes the relevance of caves as sacred and mythical space, as site for burial and ritual activity, as well as utilitarian use. He then shifts to a review of human cave use in Venezuela, highlighting its geographical distribution among the various karst regions of the country. He highlights the Turas cult in the states of Yaracuy, Lara, and Guárico, where believers of the Maria Lionza cult gather. Indigenous communities such

as the Wayu, Barí, and Yupka of western Venezuela, and the Wotuba, Mapoyo, and Hiwi of southern Venezuela have in the past and in some cases still use caves for burial purposes. SVE members interested in archaeology and history, several of them becoming professional archaeologists and anthropologists, gathered archaeological and ethnographic information from cave sites, their surveys also added to the National Speleological Cadastre (Perera 1988; Scaramelli and Urbani 2006; Scaramelli and Tarble 2000). Perera's historical speleological framework that seeks out past and present continuities allows him to note, for example, the fact that despite the impact of the European presence on indigenous communities, many caverns (47% of those listed in the review) continue to be sites of significant indigenous activity (Perera 1988:23). The present project builds on Perera's proposal of a historical speleology that seeks to integrate into an anthropological vision a broader scope of human-cave relations. Considering the activities of cavers and speleologists within that scope, this research aims to expand its range even further. Yet, it does so by "opening up" caves as it seeks their interconnections with others spaces of human practice and meaning.¹⁸

¹⁸ Caves are but one kind of feature of a very diverse and symbolically charged underground landscape. In her study of the human symbolic and material construction of the underworld, Rosalind Williams argues that the underground has been a critical stage upon which technological frontiers have been constructed and/or imagined (2008). Her review of European science fiction since the nineteenth century presents the underground as space of both spiritual and cultural revival and decadence and decrepitude. In either case, the relation between technology and humanity is at the core of the moral dilemmas countless writers have tried to present in their novels. The underground also has been a critical space where a broad range of social outcasts and undesirables have been able to outsmart dominant powers and even rebuild their communities and lives with some semblance to the normal rhythms of "surface" life (examples abound, from Christian catacombs and cities to war bunkers to the tunnels that Palestinians currently rely for the supply of goods, including arms). The subsoil also has been and remains a rich and contested domain of wealth to be either found or extracted. Tales of treasures deep within underground passages are common everywhere, often to the detriment of caverns'

Study History and Methods

In 2002, I joined the Venezuelan Speleological Society in a caving expedition to the region of Mata de Mango in Venezuela's El Guácharo National Park. I was so impacted by this experience—hiking through the jungle in search for caves, the sensation of entering a dark void not knowing where it might lead, the process by which surveyors represented the cave in their water-resistant field books, the almost obsessive dedication of a group of volunteers that had been part of this 40 year-old organization—that I decided to make it the focus of my dissertation research. At first, I centered my investigations on Guácharo Cave and the greater national park, but during my fieldwork my interests broadened to include the SVE's own ambitions: to explore, survey, and

conservation. In his ethnography *The Devil's Book of Culture*, Feinberg describes how the Mazatec community of San Agustín in Mexico's Sierra Mazateca remained both suspicious and perplexed with U.S. cavers' exploration of the regions' caves (2003: Chapter 7). Why else go into caverns if not to find something valuable, like a treasure? The belief that evil forces lurk in the cave's depth is widespread. A trip to a cave might suggest a person's devilish dealings, such as selling one's soul in exchange for riches to come. Social research also has focused on mining as a critical site where competing visions of nature, labor, wealth, modernity, and nation have been forged. Anthropologists and sociologists who have focused on mining practices, especially underground, have emphasized how the particular conditions of work—such as the constant risks, the need for collective coordination, the material and symbolic engagements with underground veins of wealth—contributes to an intense collective identity and even class consciousness (Ballard and Banks 2003; Godoy 1985; Ferry 2005; Lynch 2002; Nash 1993[1979]; Taussig 1980). In contrast to the underground as theaters of technological futures, or spaces of indiscriminate extraction of wealth, caves have been valued as spaces of adventure, escape, even solitude. Building on Williamson (2008), Michael Shortland presents caves as the stages of the sublime *par excellence*: "The sublime excites impressions that are not only powerful but, more importantly, contradictory and distorted. And nowhere, it seems, were such sensations produced more readily than in a cave" (1994:13). Thinking of caves within a broader context of underground spaces and frontiers, helps guard against pegging any one "kind" of space into static categories. The dichotomies of nature/culture, modern/primitive, sacred/profane are unstable are just as unstable below ground as they are "on the surface." Even this division of below and above must be questioned.

catalogue caves all over Venezuela. How did this project come into being? What motivates such efforts at a national scale?

I approached these questions from three angles. The first involved participant observation in all of the SVE's activities: exploration planning, participating in explorations, field training sessions, the drafting of reports, and the preparation and production of the group's publication, which features the cadastre. Most of this took place between May 2007 and June 2008. Before this, in 2004, I participated in an SVE expedition to Roraima plateau, where an extraordinary cave system was in the process of being explored and surveyed. It was at the time that I first had the experience of surveying "virgin" passage—sectors of the cavern that, to anybody's knowledge, may have never been explored by anyone before us.

As a participant observer I had to overcome the challenge of doing ethnography *in* a cave. Caves are very irregular and dark places, except for the reach and intensity of explorers' light, including my own. There usually is no comfortable or even viable vantage point from which to observe a team of cave explorers do their work. To best understand and appreciate the dynamics of survey work I had to learn to survey myself. This made me part of the team. An important result of this kind of ethnographic engagement was my own *experience*, not just in caves but beyond them. In my effort to become part of the group, a broader geography of science was revealed.

Fieldwork also involved "reading" the cadastre in the field. Here I tried to use its information to navigate the karst landscape and find and explore a cave already surveyed. This leads me to the second angle of my research approach: my acquaintance and analysis of texts in the form of published journals, cadastral entries (written descriptions

and maps), correspondence, and minutes of over 45 years of weekly meetings. Much of the perusing, reading, and rereading of all of this material was done during the long process of writing, which sometimes took on the qualities of cave exploration itself!

Although the National Speleological Cadastre contains over 700 caves, during my fieldwork I visited 14 caves in the country (Alfredo Jahn and Walter Dupouy caves in Miranda state, Sistema Roraima Sur in Bolivar state, and 11 caverns in Monagas states). Of these, 6 of the Monagas caverns had not been surveyed and perhaps only partially explored (if at all). Moreover, since most of these 6 caves required technical climbing expertise, my entry, if at all possible, was only partial. Guácharo Cave is among the other Monagas caverns that I visited. Given my original study emphasis, I lived in Caripe with a family of cave guides for four months and interviewed several members of this vibrant community. I accompanied many tourist trips into Guácharo Cave. In March 2008 I finally visited the non-touristic sector of the cavern, which included the site where Garbisu and Pérez set up camp for 30 days in 1967.

Finally, interviews with past and present SVE members make up the third main component of my research. I carried out semi-structured interviews with 30 individuals, several involving extensive follow-ups. The question of how representative these 30 individuals are of the rest of the group has no straight-forward answer. I sought out as many past and present members with a range of perspectives on the group throughout time.¹⁹ From these interviews I got recommendations of others I should contact. I must

¹⁹ My analysis lacks a focused analysis of gender. This in no way means that gender has not been an important variable in understanding the history and sociology of the SVE. Indeed, I conducted a few interviews with women who were part of the group, as well as the wives and daughters of several members. However, I could not locate some key women who were active participants during the 1980s and 1990s. Lacking their

stress, however, that we are dealing with a relatively small group. The attendance at weekly meetings throughout its 40 years typically ranged from 10 to 20 members, sometimes less, sometimes more. Of these, those that could be considered “active” were 10 or less (the yearly membership listing that appears published in the group’s journal tends to overestimate the “active” membership). Society members use this term among themselves to describe those committed to the ongoing activities of the group. These activities include planning and participating in expeditions and contributing in some way or other to the publication of the *Boletín* (some years, the job of making sure the publication came together was taken up by 5 individuals or less).

The main questions that guided the semi-structured interviews involved how informants became interested in caves, what their role and experience was as members of the SVE, and what they see as the future of Venezuelan speleology. Of these interviewees, 10 of them have answered repeated questions and discussed the arguments I present in this work as I developed them. Wilmer Pérez has been critical mentor and reader of all of my work along the way. In a very real way, this project has been the result of a conversation with those I purportedly “studied,” an ideal I have strived for since reading Gudeman and Rivera’s work on domestic economy in rural Colombia (Gudeman and Rivera 1990).²⁰

perspective, I felt I had too partial a picture of gender dynamics in the group. Another reason for my pragmatic decision to obviate any gender analysis is that it did not seem relevant for many of the topics I *do* focus on, such as the process of exploration and map-making, internal debates within the SVE regarding the science vs. exploration duality, producing and reading the cadastre, and addressing the greater geopolitics of speleology.

²⁰ A note on names. Throughout this project I use people’s real names, since most have had their contributions to speleology published in the SVE’s journal. In cases where some information was shared with me in confidence, anonymity is respected (and noted).

Aside from SVE past and present members, I also sought out other individuals who had been involved, in some way or other, with cave exploration or conservation. While the SVE is the longest-running cave group in the country, it is not the only one. However, of the others that are currently “active” (and precisely what this means requires further discussion), two of them are university clubs. The other is a revived version of the earlier Speleology Section of the Venezuelan Society of Natural Sciences. In my work I include perspectives of these non-SVE affiliated individuals, but my focus remains on the Society. I also sought out family members of deceased speleologists deemed within the community as critical actors (namely Eugenio de Bellard Pietri and Juan Antonio Tronchoni). The perspectives of government officials, part of the National Institute of Parks, also inform this work.

Just as my friends joined intense language programs to learn the language they would use in the field, I headed to Kentucky to learn about speleology. I took four cave-related summer courses at Mammoth Cave National Park through Western Kentucky University's Center for Cave and Karst Studies (the courses were on cave geology, cave biology, cartography and mapping, and the history of exploration of Mammoth Cave). Aside from a thorough theoretical and hands-on introduction to speleology, I became enthralled with the complex history of property disputes that have marked the area, a history that is filled with exploration, intrigue, political meddling, legal challenges, and above all, a meandering cave system that would not cease to "grow" as cavers pushed passages. More recently, my perspective as ethnographer and experience as caver has further grown as a member of the Iowa Grotto. Its members have exposed my husband and I to an extraordinarily varied landscape and history in this state that is now our home.

Finally, I have a very personal connection to this project. This connection and the sensibilities that it affords are woven into the very arguments I put forth. Indeed, they made this project possible. I was born in 1975 to Wilmer Pérez and Mirza Pesquera, the same couple that united during that unexpected visit deep in Guácharo Cave in 1967.²¹ My father still recalls my mother's brave cave visit with excitement and admiration. When they married in 1972, they had their wedding party in Juan Antonio Tronchoni's home. Tronchoni, in turn, became my godfather, a relationship built not on religious ties but on speleological ones.

I first learned about caves and speleology not through geography or geology courses or books or even the SVE journals in my home in Caracas. I learned about caves and speleology through my own random and exciting exploration of a number of leather-bound field notebooks that my father used to jot down his survey notes and cave sketches. As a toddler I scribbled the pages of a good number of them. Bats were common motifs in my childhood drawings. Other strange objects filled my home: bats and snakes soaking in alcohol in tightly sealed jars; helmets, boots, climbing ropes, and sleeping bags, all still with some dirt, and that wonderful musty smell; map drafting rulers, protractors, and pencils... My father took me to SVE meetings throughout my childhood as well. He gave me my first formal instruction on cave formation in the 6th grade, when I decided to be a speleologist for my class career day. In my station in the school's patio, I wore his helmet and carbide lamp with pride.

²¹ Some Guácharo Cave guides joked that I might have been conceived in the cave. "There's a room for that, you know," one told me. "It is the *Cuarto de los Enamorados* (the Lovers' Room), right off the cavern's first main gallery!" I corrected them with regret, following their joke, noting that the years just didn't add up. And yet, in a sense, my guide friends are not too far off the way things turned out.

Doing the research for this project, then, was in part a personal quest to revive, uncover, and at times create new bonds of relatedness. Archives, maps, and field notes were not just artifacts to study and analyze as objects of science but to love and cherish as mementos, even heirlooms. I soon recognized these same sensibilities in speleologists themselves as they handled their exploration gear, their personal copies of SVE journals, and their maps. From this perspective, exploring caverns was about encountering newness and all of the excitement and fantasies that that entailed. At the same time, it was about expanding and cementing the spatial reach of love, camaraderie, and friendship that bound many of the Society's members together. In a sense, caves reflect and nurture this duality: they are new and mysterious and homey and intimate at the same time. It is with the intertwining of these dynamics that geographic knowledge was forged, and in the process, the hopes of a science built on alternative relations among nature, nation, and history.

Chapter Summaries

Chapter 2 takes us to Guácharo Cave, the place where so many stories coalesce: stories of Venezuela's natural history, of speleology, of the Venezuelan Speleological Society, and even, as I have already described, my own. I develop a natural history in which guácharo birds, indigenous Chaimas, Catholic missionaries, European naturalists, state officials, and Venezuelan speleologists struggle—sometimes against each other—to define a space that defies definition (Raffles 2002:7). This struggle is revealed as different actors attempt to explore, to varying degrees of success and approaches, the cavern's passages. In the case of the Venezuelan speleologists, their efforts not only furthered the cave's

survey, they also reconfigured Venezuelan speleological knowledge and practice. As I argue throughout, explaining the how and why of *la Sociedad*—as members refer to the organization—points to an intriguing dialectic between scientific practice, sociality, and landscape. This also is a story about human engagements with and imaginings of the nation and its history.

In Chapter 3 I consider some of the ways the Society and speleological knowledge are dialectically produced. I focus on the creation of the group's publication and the definition of what would eventually become the Speleological Cadastre of Venezuela. I argue that the group's publication, which contains the cadastre, is not just the material instantiation of scientific knowledge and practices. These practices in effect *create a space* within which an alternative mode of science is possible (or at least imagined). I propose thinking about the cadastre as a “boundary object” to help explain how actors with diverse views collaborate to produce scientific knowledge, in this case, speleological knowledge (Leigh Star and Greisemer 1989). Their coming together, however, requires attending to the experiential quality of cave exploration. In this chapter I also consider early efforts to standardize cave surveying and mapping techniques. This was not just a debate about how, but also about why. Thus, speleological practice was entangled with moral and ethical judgments that helped define the SVE's boundaries as a distinct group.

In Chapter 4 we head underground as I analyze cave exploration and mapping practices. This broadens my investigations into the relations between sociality, scientific practice, and landscape. How does a cave map come into being? What do these maps represent? My analysis reveals a distinct way of relating, both physically and

conceptually, to the environment, its representations, and to others with whom we explore and survey this environment. Understanding these points again requires keeping the peculiarities of caves in the foreground. Moreover, in the case of caves, cartographic and exploratory practices are in a dialectical relation that pivots around the scale and lived experience of the human body in contact with stone. Cave mapping challenges the depiction of cartographic practices as devoid of sensorial and poetic engagement with/in the world.

In Chapter 5 I describe various attempts to read the Speleological Cadastre of Venezuela. These readings take place both within and beyond the very caves the cadastre aims to represent and order within a particular system of knowledge. As in my visit to (what I *think* was) Eduardo Röhl Cave, my “reading” attempts to find a correspondence between the representation and place in the world. It emphasizes an understanding of humans’ engagements with place as relational, temporal, and multiple (e.g., Massey 2005). Where does the map fit in this relational approach? I argue that we consider these engagements in dialectic with representations (Csordas 1994; Lorimer 2005; Macpherson 2010). This includes their symbolic, material, and even affective qualities. While the past chapters have focused on the processes of producing these representations (defining survey standards, mapping in the field), here I turn to their multiple and sometimes contentious readings.

Chapter 6 examines speleology’s sporting-science duality as it plays out at different points of the SVE’s history and from the perspective of key players. This is a quality that has been shown to splinter speleological groups elsewhere (Cant 2006). Yet, I suggest that in practice, speleology’s sporting-science quality has the capacity to unite as

much as to divide its members. I test this idea not just among SVE members, but also among SVE members and the indigenous Chaima guides of the northern Monagas karst whose environmental knowledge and trekking skills have led to the success of expeditions to the area. This case provides a novel perspective on “cultural encounters.”

With caves, I suggest, we are dealing with a particular kind of landscape whose exploration, mapping, and study involves a group effort whose success is premised on a variety of skills and expertise. While in Chapter 3 I argue we think about the cave map and registry as boundary objects, here I consider thinking about the broader cave landscape as a boundary space whose exploration has the potential to bring diverse actors together in a common task, a common experience. This examination also aims to temper the “scientific” bias in my own analysis by attending more to the “sporting” side of human engagements with/in the landscape.

Chapter 7 examines some of the blurry boundaries between citizens and the state in the context of the broader geopolitics of speleological practice. In counterpoint to the arguments presented in earlier chapters, which present caves as distinct spatial domains hidden from technological and state reach, the Society’s national speleological project is revealed here as potentially risky in so far as it could be appropriated by the state for purposes that most Society members might reject both on political and moral grounds. Are cavers making caves visible for the state? That is a question I consider here, which members of the Venezuelan Speleological Society have asked themselves at different points of the organization’s history, with different effects. Again, the geographies of speleology are shown to have complex and multidimensional spatialities that spill beyond the prescribed spaces “of science.” Their dynamics pervade geological, ecological, and

political landscapes that explorers must learn to negotiate in order to practice speleology and explore both the caves, and alternative visions of, the nation.

Finally, in Chapter 8 I turn to two topics that beg closer attention. First, I consider some of the ways an anthropology of speleology resonates with ethnographic inquiry more generally. Second, I reflect on my own positionality vis-à-vis my object of study. I do this as I traverse Guácharo Cave's more hidden passages, with map in hand, the very map that Garbisu and Pérez helped created back in 1967.

Chapter 2

Of Monuments and Men: The Exploration of Guácharo Cave and the Origins of Venezuelan Speleology

Two years prior to Garbisu and Pérez's 30-day stay inside Guácharo Cave, Pérez joined the members of the Sección de Espeleología de la Sociedad Venezolana de Ciencias Naturales (Speleology Section of the Venezuelan Society of Natural Sciences or SE-SVCN) on their attempt to finish the exploration and survey of Guácharo Cave. The ambitious week-long expedition took place during the 1965 Holy Week, while many Venezuelans traveled to the beach to vacation under the hot Caribbean sun.¹ This expedition joined a long history of attempts at revealing and understanding this cavern. Alexander von Humboldt visited the cave in 1799 and produced what is regarded as the first scientific description of any cave in the Americas (Humboldt 1966[1817]; Urbani 1999, 2005). He also collected, scientifically named, and described its raucous inhabitant, the nocturnal oilbird, or "guácharo" (*Steatornis caripensis*) (Humboldt 1981[1817]). Humboldt's visit, along with the presence of guácharo colonies, were key in making Guácharo Cave an important cultural, political, and even economic regional and national landmark. In 1949, the Venezuelan government inaugurated the Alexander von Humboldt

¹ In Venezuela, Holy Week is the longest national holiday of the year. Thus, it has and continues to provide a perfect opportunity for speleologists to plan their most important expeditions year after year.

Natural Monument, the nation's first, at the site. Yet, as of 1965, speculations of the cavern's true dimensions remained, with no complete or accurate map in sight.

This chapter revisits this 1965 expedition as a key precursor to the national speleological project that would begin in earnest in 1967 with the foundation of the Venezuelan Speleological Society. I tell this story in the context of Guácharo Cave's natural history. In doing so, I introduce caves' material and symbolic qualities as embedded in a broader natural and cultural landscape. By natural history, I follow Hugh Raffles's definition: "an articulation of natures and histories that works across and against spatial and temporal scale to bring people, places, and the non-human into 'our space' of the present" (2002:7). In particular, I focus on the attempts to explore and represent it, processes aimed at "stabilizing" the cavern as a knowable and bounded object of science. I describe a number of key events that transpired before, during, and after this week-long effort. Not only did this effort dramatically further the cave's survey, it also reconfigured the foundations of Venezuelan speleological knowledge and practice. For example, in this expedition, new members contributed novel field techniques that made a more thorough and accurate study of Guácharo Cave possible.

In fact, this 1965 expedition in several ways challenged institutional science in Venezuela. Against the traditional practical and ideological hierarchy and exclusivity that characterized the Speleology Section, along with most other institutions of science and learning in the country, the group's new director at the time welcomed new members and valued them for their skills, regardless of age, social status, and institutional affiliation. The gesture and conditions for this invitation were unprecedented. Those who embraced the status quo and saw their own scientific ambitions challenged resisted. Tensions and

disagreements culminated in the breakup of the group and the creation of the Venezuelan Speleological Society in 1967. This new Society's identity as an independent, autonomous, non-hierarchical, collective, open, and civic scientific enterprise of national scope makes it an odd phenomenon in the history of Venezuelan science. That the group has been in continuous existence for over 40 years, along with its publication, makes it even more remarkable.

As I argue throughout, explaining the how and why of *la Sociedad* points to an intriguing dialectic between scientific practice, sociality, and landscape. This requires keeping the experiential, affective, and relational qualities of scientific practice in the foreground. All of these qualities come into being in and with place. In the case of caves, my approach is not just about acknowledging their "physical reality" (Prufer and Brady 2005:7). Instead, I embrace caves as spaces experienced in all of their complexity. This complexity is not simply a quality of caves, but of *humans exploring caves*. Encounters with/in caves are not just about encounters with stone. Movement within underground passages involves shifting patterns of light and darkness, sound and silence, as bodies negotiate their next steps, not quite sure where they might lead (Bille and Sørensen 2007; Helmreich 2007; Taylor 1996). Encounters with/in caves also are potent affective experiences with the potential of exciting the imagination (Eshleman 2003; Sheets-Johnstone 1990). It is with this dialectical understanding of caves and human bodies that I revisit key events at Guácharo Cave, events that had such profound impact on the site, its local community, and the history of Venezuelan speleology.

How do some of these qualities impinge on scientific practice? The goal of the speleologists was to explore and survey the entire cavern. Yet, the limits of their own

bodies' capacity (and at times even willingness) to explore *and* survey every possible passage also means acknowledging the limits of their scientific enterprise. One of the most intriguing characteristics of cave exploration is that one might never know if the end of a cave was ever reached. Even today, some cave explorers suggest Guácharo Cave might contain unexplored passages. Despite years attempting to learn, know, and reveal Guácharo Cave, its precise identity remains elusive, mysterious, unbounded.

Telling the story of that 1965 exploration of Guácharo Cave and the origins of the Venezuelan Speleological Society in the context of a broader natural history reveals other intriguing subversions and entanglements. Well before Europeans arrived to the Americas, Guácharo Cave already was a sacred site for indigenous communities in the region. Providing this context also highlights the Venezuelan speleologists' efforts to define their relationship to past explorers (Humboldt being the most important) and to the state's project to monumentalize the site. This also is a story, then, about human engagements with and imaginings of the nation and its history.

Guácharo Cave in Time and Space

For thousands of years, the slow but steady trickle of acidic water has dissolved the limestone that crisscrosses the Turimiquire Range of present-day northeastern Venezuela. The limestone in which Guácharo Cave developed dates to the Inferior Cretacean (SVE 1968). In fact, the process of limestone dissolution has peppered the landscape with many caverns. Most are hidden from plain view under the thick forest. Most also are *alive* both as part of dynamic hydrological systems and as sites of rich ecological diversity. With each drip, stalactites grow a little longer, and below, stalagmites grow a little taller. The

cave you leave behind is, to an almost imperceptible degree, not the same one you entered.

In this region of Venezuela, a cold drip might also come from one of the hundreds of oilbirds that have made the underground their home (Bosque 2004).² These nocturnal oilbirds, or guácharos, rely on echolocation to navigate darkness, whether in the cave or in the region's forests as they search for the fruits of Oil Palm and laurel trees (Bosque, Ramírez, and Rodríguez 1995). Once back in their caves, guácharos regurgitate the fruits' seeds. The seeds pile up by the millions and, when mixed with mud, guano, and water, fill them with a pungent smell.³

Guácharo Cave in Indigenous Cosmology and Practice

Guácharo Cave also is alive with a rich cultural history. To the indigenous communities that had inhabited large extents of northeastern Venezuela, caves were an important part of their material and ideational landscape.⁴

Chaimas' relation to the Venezuela's northeastern karst landscape dramatically changed with European incursions dating back to at least 1542 (Urbani 1993). There is unconfirmed evidence that the cave may have been the center of resistance of Urimare,

² For this reason, Guácharo Cave guides recommend that visitors keep their mouths closed when looking up at the vast ceiling of the cavern's first gallery.

³ Despite the oilbirds' presence as far north as the island of Trinidad and as far south as Ecuador, Guácharo Cave is only among a few caverns in the continent where tourists can appreciate the relations forged between oilbirds, bats, the many species that depend on their regurgitated seeds and guano, the cavern, the forests, and the rivers beyond. However, Guácharo Cave is by far the most famous, and to many, the most beautiful, the most majestic.

⁴ Indeed, the indigenous and folk importance of caves is not limited to northeastern Venezuela. It extends to indigenous communities living in the karst regions of the Perijá Region and southern Venezuela (Perera 1988; Scaramelli and Urbani 2006; Vilorio 2002). See Chapter 1.

an indigenous woman *cacique*. She was purportedly captured and killed by the Spanish in the coastal town of Cumaná sometime between 1609-1610 (De Civrieux 1998:42; Urbani 1999:52). Since the mid 1600s, Aragonese capuchins and Franciscan friars rivaled each in gaining control of land and indigenous populations. The threat of French, English, and Dutch colonists and pirates compounded these rivalries. By the mid 1700s, creole ranchers also claimed land and labor. Despite repeated efforts to resist these invasions, a large portion of the indigenous population—Chaima, Coaca, Pariagoto, and Warao among them—were put into *reducciones*, or christianized settlements (De Civrieux 1998:39-80). It was in two of these settlements (Santa María and San Francisco del Guarapiche) that Friar Francisco de Tauste carried out his linguistic study among the Chaima between 1660-1664. Scholars and current Chaima activists alike recognize Tauste’s work (1964[1678]) as the first thorough source on indigenous culture in the region, even while noting its limitations and biases (Biord 2006; De Civrieux 1998; Urbani 1996, 2005).⁵ Tauste also authored the first known published description of Guácharo Cave, focusing on its mouth, its subterranean river, some cave formations, and the guácharo (Urbani 1996).

In his ethnography *Los Chaima del Guácharo: Etnología del Oriente* (1998), Venezuelan anthropologist Marc de Civrieux relied heavily on Tauste to reconstruct the “process of acculturation” of the Chaima. This history prefaces his ethnography carried out between 1970 and 1975 among Chaima “descendants, who survive in the hidden

⁵ Nicolás Zapata, whom I interviewed in Caripe in 2008, concurred with this view. That year, he was one of the main leaders within Asochaica, an organization of regional activists dedicated to the research, reaffirmation, and political recognition of Chaima indigenous culture. Venezuelan anthropologists Horacio Biord has been analyzing this resurgent indigenous movement (Biord 2005, 2006). I thank Biord for pointing me to key Asochaica members, all of whom kindly helped me with my work.

landscape of the eastern mountains [of Venezuela]" (de Civrieux 1998:21). Based on extensive oral histories and accounts collected from among the elderly "descendants," de Civrieux affirmed the continuity of Chaima beliefs and practices. These beliefs and practices are intricately tied to the landscape, both above and below ground.

As de Civrieux notes, "the caverns and mountains, abundant in the Caripe range, were and continue to be considered sacred places, natural magical temples where the spirits of ancient *piazan*, the souls of dead ancestors ... roam" (1998:169). Yet, none is more important than Guácharo Cave. To the Chaima, this cavern is the home of *Amanaroca* or *Chotokompiar*, the creator of the people. He was born in Guácharo Cave to his father the Sun and his mother the Air. He had a brother, *Uruipin* o *Coronoima*, with whom he fought and threw against a hill. The nearby Cerro Negro, the Turimiquire Range's second highest point at 2,430 meters, is said to be the Uruipin's transmuted body (de Civrieux 1998:166-167; Peñalver Bermúdez 1993:29). Not only is Guácharo Cave the birthplace of the first Chaima, it also is the place where souls of ancestral shamans take refuge. In its darkness they take the form of guácharos (de Civrieux 1998:116; Peñalver 1993). These ancestral shamans also are owners of the caves and shadows, both revered and feared as the guardians of tribal law. And, "while these spirits can come to the aid of men, by means of the *marequeros* [spiritual leaders], they can also cause infinite harm when they feel threatened" (de Civrieux 1998:124). This ambivalent character, both of the caves and the spirits they contain, is an aspect of indigenous notions of the underground that has been repeatedly overlooked, a point to which I will return.

Not angering the spirits of the caves was particularly important during the Chaimas' yearly incursions underground to capture guácharos (de Civrieux

1998:116;121-125).⁶ When young, oilbirds contain a large pouch of fat under their skin. The Chaimas valued this oil very highly for its purity. They used it to season foods (de Civrieux 1998:147). They also ate the birds' meat. Guácharo hunting continued well after the establishment of Christian settlements in the region, much of it to satisfy the demand of missionaries who used the oil for lighting their lamps and cooking (de Civrieux 1998:123,157).

Oilbirds make nests along the higher ledges of the cave walls, far from the ground so as to be out of reach from predators. In the case of Guácharo Cave, whose impressive first main and relatively horizontal gallery ranges from 20 to 30 meters in height, hunters constructed tall ladders, sometimes up to 20 meters long, with a single wooden pole and small branches tied horizontally as steps (SVE 1968). At its top end they tied an *hacho* or torch to light their way.⁷ Juan Ribero and Isaías Calzadilla, two of the elderly men whom de Civrieux interviewed in the mid 1970s, noted that much preparation was involved in

⁶ Tauste was among the first to describe this indigenous practice (Urbani 1996). Archaeological evidence suggests that it dates back to at least 1,500 A.D. (Perera 1976). Current and past Guácharo Cave guides, many whom grew up in the immediate vicinity of the cave, suggest that this practice, devoid of its ritual importance, was alive well into the mid 1960s. It slowly came to an end with the transformations of Guácharo Cave that followed the declaration of Venezuelan's first natural monument in 1949 at the site. It is currently illegal to hunt guácharos in the cavern.

⁷ De Civrieux bases these descriptions on the accounts of Tauste (1964[1678], 1680), Humboldt (1966[1818]), Codazzi (1974[1835]), along with oral accounts of Chaima descendants he interviewed in the 1970s. He does not include a first-hand ethnographic account of this hunting practice. As I note in more detail in Chapter 6, the sophistication and extent of the hunting skills involved in oilbird capture have been appreciated and described most fully by members of the Venezuelan Speleological Society. Thanks to the support and knowledge of Chaima men, SVE members located and surveyed the caverns, many of them deep pits, of the mountains surrounding the Caripe valley during the 1970s and early 1980s (Galán 1981; 1991). In fact, Chaima descendants who live in the Turimiquire mountains away from the hustle of the Caripe valley retain and routinely put into practice the skills required to enter caverns, many of them much more physically challenging than Guácharo Cave, and capture oilbirds for their oil and meat (Galán 1981; 1991).

the yearly ritual. Under the direction of the spiritual leader or *cacique*, up to a dozen men gathered the necessary wood for ladder-building and torches that only the *cacique* himself could assemble (de Civrieux 1998:125). They also prepared gifts for the spirits.

In the words of another of de Civrieux's informants, Elogio Caripe,

No one can enter the cave without bringing gifts to the *kámara* [spirit]. After the *cacique* offers tobacco and rum, he speaks [to the *kámara*]: ‘these people will enter with much respect and order, they will enter with me. From you your birds they will take, no more, no less, they bring gifts. Place your birds low for them! They only want to take what is necessary and share them among all. They are good and do not want to cause harm in your house. [de Civrieux 1998:125]

Another of de Civrieux's informant, Luis Arrayán, detailed the consequences of not following the rules: “if [the men] do not obey the rules, they get lost, they are taken away by the spirits of the cave and are turned into stone” (de Civrieux 1998:127).

As a focal point in the cultural landscape of the indigenous Chaima, Guácharo Cave was a site of origin, death, but also regeneration in the form of guácharo oil, meat, and communion with their ancestors. The Chaima maintained and honored these qualities through engagements that emphasized respect and exchange. The arrival of missionaries and naturalists, however, altered these human relations with the physical and ideational landscape. Enacting western ideologies of natural science, whereby nature was to be objectified and represented, an increasing number of visitors sought to penetrate the cave deeper and deeper, often ignoring or disregarding the sacredness of this site.

European and Creole Incursions into Guácharo Cave

According to Venezuelan speleology historian and geologist Franco Urbani, no other cave in the Americas enjoys the “extraordinary historical richness” of Guácharo Cave

(Urbani 1999:51). With this statement, however, we must acknowledge the bias and violence in such history; much of this “depth” and “richness” is evident to the historian (and the anthropologist) due to early European incursions that produced many textual references of the site (Wolf 1982). Urbani’s work is my primary source in a summary of this textual history (Urbani 1999, 2005).

The search for slaves along the coast of South America may have lead European traders to the Guácharo Cave region by 1542 (Urbani 1999:52; Urbani 1993). In early 1659, Capuchin missionaries founded the Santa María de los Angeles mission just north of the Cerro Negro mountain and from there explored the area. That same year, Agustín de Frías and Miguel de Torres were the first of these missionaries to visit to the cave. The first known document to mention the cavern is a letter that Frías wrote to the Bishop of Puerto Rico in 1660. Frías’s fellow missionary José de Carabantes authored in 1666 the first published account of the cavern. Francisco de Tauste, who in 1664 founded the San Francisco de Chacaracuar mission south of the Caripe valley, originally published in 1678 the important work already noted. The number of European and creole visits to Guácharo Cave increased after the founding of the Santo Angel Custodio de Caripe mission in 1734. This mission, located only a few kilometers from the cavern in what is now Caripe, soon became the main Capuchin center in eastern Venezuela. In 1773, the bishop of Puerto Rico, Manuel Jiménez Pérez, and his secretary Iñigo Abbad de la Sierra, made an official visit to the cavern. Abbad produced a manuscript, dated to 1781, which describes a short portion of the cave’s large main gallery, its stalactites, the oilbirds’ evening exodus, and the indigenous bird hunting and oil extracting practices. In 1795, the Venezuelan creole Dr. Francisco de Ibarra visited the cavern. He probably made it as far

in as 802 meters (Urbani 1999:52; 1996).⁸ Four years after, Alexander Humboldt visited the cave. He did not make it as far as de Ibarra. Yet, the impact of his visit was profound, and some argue, categorically different from any before this time.

Humboldt In and Beyond Guácharo Cave

Scholars have critically examined Humboldt's importance in Latin American natural and political history (Burnett 2000; Cañizares-Esguerra 2005, 2006; Carrera 2011; Dettelbach 1996; Pratt 1992; Raffles 2002; Saldaña 2006). Mary Louise Pratt judges Humboldt as the most successful agent of transcultural dynamics that lead to the reinvention of both the Americas and Europe (1992:111-112). According to Pratt, he pioneered among Europeans naturalists descriptions of "nature in motion, relational" although these are often "depopulated, dehistoricized" (1992:120-121). However, to some Latin American scholars, such critical reading does not go far enough (Cañizares-Esguerra 2006; Saldaña 2006). To them, much scholarship on the history of science in Latin America remains Eurocentric, perpetuating the view of Latin America as culturally backward and derivative (Cañizares-Esguerra 2006; Lafuente and López-Ocón 2006; Saldaña 2006). With regards to Humboldt specifically, Cañizares-Esguerra (2005) challenges the assertion that he was the founder of ecology. Instead, Humboldt derived his relational notion of nature in part from both indigenous and creole ideas. These ideas were already in vogue among Spanish American scholars that the German naturalist came in contact with and depended on during travels between 1799 and 1804. This point emphasizes the

⁸ This is the length of the cave's massive first and largest gallery and also the only one to contain guácharos since the hole that leads to remaining passages is too small for their comfortable crossing.

fact that by this time, Spanish America had already experienced three centuries of growing and at times quite productive scientific traditions. If we consider the cultural heritage of indigenous knowledge, this history extends back even further (Cañizares-Esguerra 2005, 2006; Mignolo 2005; Pratt 1992; Saldaña 2006).

There is little doubt, however, that Humboldt's travels and writings played a profound role in Hispanic creole naturalists' imaginations as they forged their nationalist visions and agendas (Carrera 2011; Pratt 1992; Saldaña 2006).⁹ Humboldt's approach to natural history—one premised on analogies based on direct observation and experience—resonated with at least some creoles' own home-grown Enlightenment projects of national natural histories (Carrera 2011; Saldaña 2006).¹⁰ The flip side of the embrace and celebration of this Humboldt's achievements as a natural scientist, however, is the idea that "America needs European culture to provide it with information about itself" (Carrera 2011:80).

⁹ Although precisely what shape this role took is a point of debate. Again in a revisionist stance, Cañizares-Esguerra challenges Pratt's assertion that

Humboldt's representations of a lush, exuberant tropical America captivated Latin American elites desperate for European validation. Pratt's thesis marvelously fits our expectations of the nineteenth-century Latin American comprador bourgeoisie: hopelessly derivative. But Pratt is wrong. At least in Mexico, intellectuals forging a national landscape furiously fought *against* the type of landscape aesthetic first introduced by Humboldt. [2006:153-154, but see Carrera 2011 for a counterpoint to this argument that, if anything, emphasizes creole elites' diverse reactions to Humboldt's influence]

¹⁰ For example, nineteenth century Mexican geographer Antonio García Cubas revered the Prussian. Cubas's popular and influential *Atlas pintoresco é histórico de los Estados Unidos Mexicanos* (*Picturesque and Historical Atlas of the Mexican United States*) (1885) follows Humboldt's geographical approaches and incorporates copies of Humboldt's own images produced during his travels in Mexico in the early 1800s (Carrera 2011:67).

In Venezuela, Humboldt has been a revered icon, at least among the elite, second perhaps only to Simón Bolívar (Briceño Monzón 2005). Not only was the country's first natural monument christened in his honor, so was one of the highest peaks in the Venezuelan Andes (Bolívar Peak is the highest). The government of Pérez Jiménez (1948-1958) declared the creation of the monument at Guácharo Cave in Caripe in Humboldt's honor. It also commissioned the construction of a luxurious hotel at the top of Avila Mountain with views of the Caracas valley to the south and the Caribbean sea to the north.¹¹ It was called Hotel Humboldt.

Pérez Jiménez's policies promoted a 'New National Ideal' that sought industrial developments alternative to oil (Reig 2006/2007:63). Along acknowledgements of social repression, historians and indeed, many Venezuelans, recall the Pérez Jiménez as Venezuela's great Modernizer (Carrera Damas 1972; Coronil 1997). This involved creating an economic, civic, and cultural infrastructure that materially and symbolically transformed the nation's landscape, with the state focused on "constructing the nation" with monies from the growing oil industry (Coronil 1997:72-73,167).

The creation of the first natural monument at Guácharo Cave could be understood as an early step towards this transformation. Indeed, the selection of Guácharo Cave reflected Pérez Jiménez's vision of a nationalism that not only modernized the country, but at the same time respected tradition and elevated, in his words, "the Venezuelan spirit" (Coronil 1997:168). That the monument was named after Humboldt suggests that Europeans might still have an important role to play in the definition and consolidation of

¹¹ While Pérez Jiménez did not officially become president after elections in 1953 (these elections are believed to have been state-orchestrated), he already was exercising extraordinary power as member of the military junta that took over the country's leadership after a 1948 coup (Carrera Damas 1972; Coronil 1997).

such spirit.

Humboldt and his companion, French botanist Aimé Bonpland, visited Guácharo Cave on September 18th, 1799. To Urbani, this event marked the “birth of Venezuelan speleology,” despite the fact that they were not the first to explore Guácharo Cave (Urbani 2005b:56).¹² This was not Humboldt’s first encounter with the underground. In Europe he had already visited famous caves in England, Romania, and Germany (Urbani 2005b:56). Humboldt’s original travel itinerary to the Americas, which began in June of 1799, did not include a stop along the shores of northeastern Venezuela. That changed when a fever outbreak in his ship forced a stop at the Cariaco Gulf of Cumaná. Here he first heard about a large cave with birds, prompting him to lead his expedition inland (Humboldt 1966[1817]:81).

On September 15, Humboldt and Bonpland arrived at Caripe. At the time Caripe still was a very small village of mostly indigenous families living within the bounds of missionary religious norms. On September 18th, their missionary hosts and Chaima men led the two Europeans along a short hike uphill to Guácharo Cave. In his *Personal Narrative of Travels to the Equinoctial Regions of the New Continent During the Years 1799-1804* (1966[1817]), he describes the experience, emphasizing a series of surprises that captivated the visitors. The cavern's gaping entrance was the first among them (Fig.2.1):

[The entrance] forms a vault eighty feet broad and seventy-two feet high. This elevation is but a fifth less than that of the colonnade of the Louvre.

¹² Nor does Humboldt in any of his writings formally acknowledge his work as contributing to speleological science. As noted in Chapter 1, the conceptualization of such a science did not occur until the late 1800s, although plenty of naturalists and explorers already had been investigating aspects of cave hydrology, geology, and ecology that would later become the hallmark of speleology (Shaw 1979).

The rock, that surmounts the grotto, is covered with trees of gigantic height. . . . What a contrast between the Cueva of Caripe, and those caverns of the North crowned with oaks and gloomy larch-trees!
Humboldt 1966[1817]:123]

Humboldt placed this particular cavern, not just in comparative context with other caves, but in relation to general laws that inform predictions of what he might encounter. His chapter ends with a lengthy consideration of the possible origin and date of the cave, accurately noting that it must have resulted from limestone dissolution at a time when this theory still was not broadly accepted (Humboldt 1966[1817]:140-141; Shaw 1979, 2004; Urbani 2005a:57). Moreover, preceding the multidisciplinary spirit of this science, he also focuses on other aspects of the cave environments: its flora, fauna, and cultural uses and visions associated with the space. To Urbani, this scope brands Humboldt's *Personal Narratives* as his "major speleological contribution" (2005a).

Guácharo Cave further surprised the naturalist on other counts. First, vegetation sprouting from the millions of regurgitated seeds could be found well within the cavern where daylight reaches only partly, dimly, and in some cases, not at all (Humboldt 1966[1817]:124). Second, the cavern's guácharo proved to be a new species, which Humboldt named *Steatornis caripensis* (Humboldt 1981[1817]) (Fig. 2.2). Bonpland captured two guácharos, not for their oil or meat, but for their value as specimens of science (Humboldt 1966[1817]:133).

The cavern (this portion of it, at the time the only known) bewildered the senses with its form and content. Visitors encountered a dark and humid subterranean vault, with a pungent smell of mud, guano, burning torches, and that noise... that wild cacophony of guácharo cries that human intrusions with their lights made more intense. Upon exiting the grotto, Humboldt describes being "glad to be beyond the hoarse cries of the birds, and

to leave a place where darkness does not offer even the charm of silence and tranquility” (Humboldt 1966[1817]:136).

Finally, the cave’s relatively uniform shape intrigued Humboldt (1966[1817]:131). At his reported 472 meters from the entrance of the cavern, he specifies, “[t]he Grotto of Caripe preserves the same direction, the same breadth, and its primitive height of sixty or seventy feet” (1966[1817]:131). Based on the description of that point in the cavern, however, Urbani argues that Humboldt’s party only made it 422 meters from the cave’s entrance (1975). Venezuelan speleologist and founder of the Speleology Section Eugenio de Bellard, however, disagreed with Urbani, siding with Humboldt’s assertion (de Bellard 1980). Regardless of the exact distance traveled, it is intriguing that the group had to turn back when it did. Humboldt knew that the cavern was at least 300 meters longer. He learned this at the convent from Dr. Francisco de Ibarra’s written account of his 1795 cave visit that I already noted above.¹³ The only explanation we have of this turn of events on that September day comes from Humboldt himself, since there is no other known account produced by any other member of the party. As Urbani explained to me, Humboldt never stated precisely who or how many these members were in any of his writings. In his *Personal Narratives*, he notes

The missionaries, with all their authority, could not prevail on the Indians to penetrate farther into the cavern. As the vault grew lower, the cries of the guacharoes became more shrill. We were obliged to yield to the pusillanimity of our guides, and trace back our steps. [Humboldt 1966[1817]:135]

With this, the depiction of the Chaima guides as fearful and superstitious is sealed, repeatedly echoed to this day in descriptions of Humboldt’s truncated scientific

¹³ Humboldt, erroneously, identifies this visitor as a bishop from Guiana (Humboldt 1966[1817]:135; Urbani 1996, 1999:52).

aspirations. Yet, it is consistent with Humboldt's interpretation of indigenous relations to the caves. In his view,

The natives connect mystic ideas with this cave, inhabited by nocturnal birds; they believe, that the souls of their ancestors sojourn in the deep recesses of the cavern. ... To go and join the guacharoos, is to rejoin their fathers, is to die. ... Darkness is every where connected with the idea of death. The Grotto of Caripe is the Tartarus of the Greeks; and the guacharoos, which hover over the rivulet, uttering plaintive cries, remind us of the Stygian birds. [Humboldt 1966[1817]:132-133]

Where Humboldt sees death, the Chaima see the potential for life, for regeneration, through the oil and meat of the birds captured as part of a ritualistic exchange with their ancestors. Countering a dichotomy that renders light as good and dark as evil, to the Chaima, an "ambivalent character" characterized caves and their spirits (de Civrieux 1998:169). Whether this character took a benign or evil tinge depended on human's relations to these entities and the space that housed them. It depended on following *el reglamento* (the rules).

Even if we do not have any other sources on the events of that day, clues in Humboldt's own text that point to other factors that may have contributed to the early retreat:

We find, that a bishop of St. Thomas of Guiana had gone farther than ourselves. He had measured nearly 2500 feet [960 *varas*] from the mouth to the spot where he stopped, though the cavern reached farther. ... The bishop had provided himself with great torches of white wax of Castille. We had torches composed only of the bark of trees, and native resin. The thick smoke which issued from these torches, in a narrow subterranean passage, hurts the eyes, and obstructs the respiration. [Humboldt 1966[1817]:135-136]

This passage powerfully grounds a projected reconstruction of the events of that September day. The party had set out early in the morning from the convent along a hike to the cavern's mouth. Within the cave they walked along the banks of the inner river as

much as they could. Sometimes they had to wade in the water, a traverse that amounted to plenty of “thick mud” (Humboldt 1966[1817]:131,134). Present-day visitors to Guácharo Cave can only imagine the challenge of such an excursion, since they benefit from a cement and stone trail that covers the entire 1,200 meters of the tourist route. Even then, the path requires constant cleaning to keep it from caking up with mud that makes the passage, which has no handrails, extremely slippery. Most certainly, Humboldt’s party benefitted from much more light than do current tourist groups: the former had several people hoisting torches, while the latter rely on the gas lamps that their single guide carries along the irregular trail.¹⁴ Less light, but no smoke. Add to this the rising shrill of the perturbed guácharos, it is not hard to imagine some in the group—maybe even the distinguished visitors?—eager to turn back and get out.

Many narratives of discovery are heroic tales of man overpowering nature, often by virtue of ever sophisticated technological might. Not here. His exploratory yearnings cut short, Humboldt must have been tempted to push on. He knew that the cave went further. Imagining that episode, it is impossible to miss the irony of a man so celebrated for his vision, at the mercy of his unidentified indigenous guides and other local companions, their smoky torches, the mud, the birds’ wild racket, and the imposing darkness.

With Humboldt’s account as our only source, we might never be able to reconstruct the precise events of that September day at Guácharo Cave, at least not from others’ perspectives. Yet, consideration of these very material and symbolic hurdles to exploration helps us appreciate the complex dynamics that mutually shape human

¹⁴ This has prompted some tourists, who are not allowed to use personal flashlights in the cavern’s sector with oilbirds, to use the screens of their cellphones to help light their step.

experience and place itself. Humboldt's own narrative reveals details that subsequent texts that reference it have ignored or edited out. I reject treating the cavern and its distinct ecology contained therein as concept or mere background or context (Bonsall and Tolan-Smith 1997; Brady and Prufer 2005). Favoring a view of humans as organisms in constant engagement with and perception of the material world around them, bodies and landscape affect each other (Csordas 1994; Ingold 2000; Macpherson 2010; Merleau-Ponty (2005[1945]); Mlekuž 2011).¹⁵ Chapter 4 revisits and expands this analysis of human-cave encounters. For now, this theoretical approach to such encounters aims to broaden the interpretative possibilities of that fateful event at Guácharo Cave in 1799. Thus, not only must we ask the extent and manner in which Humboldt was an agent of imperial power. We must consider him as a being with an "affected body" in a complex "web of relations" with other beings in a place whose particular affordances shape and are shaped by the dynamics of such relations (Ingold 2000:166-168; Mlekuž 2011:3). This perspective contributes to a natural history that "bring[s] people, places, and the non-human into 'our space' of the present" (Raffles 2002:7). It also a perspective that must remain with us as we follow the developments of speleological science in Venezuela since Humboldt's fateful visit.

The representation of the fearsome and superstitious Chaima guides remains, but not without its challenges. During my many trips into Guácharo Cave between 2007 and 2008, I heard several guides suggest an alternative interpretation: Perhaps the Chaima companions did not deem it proper for Humboldt and party to go in any further. Doing so

¹⁵ With *affect* I follow Slovenian archaeologist Dimitrij Mlekuž's use of Deleuze and Guattari (2004) in his analysis of the ways bodies (both human and non-human) and caves mutually constituted each in the Neolithic Karst (2011).

might have disrupted the peace of their ancestors' souls that they believed rested in the cavern's depths. This interpretation rejects the notion of the frightened Chaima whose superstition stands in the way of science. Instead, it suggests that of the conscientious and even proud Chaima who protect their world from the incursion of outsiders. Members of the Venezuelan Speleological Society that forged strong bonds with Chaima descendants during their cave explorations in the mountains of the Caripe valley during the 1970s also reject this depiction (Galán 1981:29). As one of them told me,

[Humboldt's explanation] is bullshit. I can guarantee that those guys [the Chaima guides] weren't afraid. Humboldt was simply echoing a stereotype that his audience expected to have confirmed by his own experiences.
[Anonymous, Personal Communication, August 8, 2011]

Yet, since that September day in 1799, and, especially, since the publication and circulation of Humboldt's accounts, first in Europe and eventually in the Americas, Guácharo Cave's physical and cultural landscape were forever transformed. They spurred many more naturalists, both European and creole, to visit the site. On the one hand, this helped promote Caripe as an important cultural and economic center along Venezuela's eastern coast (Rogelio León and Mostacero Villarreal 1997). Historical records point to a small but growing community of expert guides or *baquianos* who profited giving tours into the cavern. Many of them and their families lived in the lands immediately adjacent to Guácharo Cave.¹⁶ On the other, it accelerated the almost 400-year-old process of "desacralizing a space traditionally dedicated to the cult of the ancestors" (de Civrieux 1998:169). The 1949 creation of the Alexander von Humboldt Natural Monument prompted the relocation of the families living next to the cave. The demolition of their

¹⁶ Although Chaimas are widely believed to have acculturated, while those considered their direct descendants mostly live in mountain villages away from the Caripe center, a few guides who grew up near or next to the cave still claim Chaima ancestry.

homes made room for the building of tourist infrastructure: a parking lot, a ticket booth, restrooms, a museum, a small administrative office, a restaurant, and a plaza that guides visitors in an orderly and mud-less manner to the cavern's gaping entrance. Once inside the cavern, stone and cement defines the 1,200 meters of tourist trail. A third of the distance along this path, visitors encounter a marble plaque placed there in 1959 commemorating 100 years of Humboldt's death (Fig. 2.3). It is 472 meters from the cave's entrance, the distance he claimed to have reached in 1799.

A life-sized statue of the German naturalist first greets visitors prior to entering the cave. This statue crowns a large cement structure located along the south side of the plaza that was constructed after removing the cave's *caserío* (hamlet) in the late 1960s. This structure doubles as seating area and barrier. Strategically placed along the edge of the winding road leading to the monument, its tall wall helps block the headlight beams of cars driving up at night. Thus, it minimizes the disruption such light might cause the photosensitive oilbirds as they leave the cavern at sundown. Every evening of the year, visitors gather here to listen to a cave guide narrate the history of exploration of the cavern and to learn about its geology and ecology. Since 1983 Germán López proudly has taken up this job. His authoritative voice and attention to historical detail builds up the visitors' anticipation of the bird's nightly exodus.¹⁷ As the night sets in (there are no lights in the premises), the birds' cackle grows louder, announcing their imminent exit. Meanwhile, Humboldt's stony silhouette watches over the nightly ritual.

¹⁷ While some birds do exit and return to the cave in the same evening, many do not. Recent research by Venezuelan ornithologist and long-time Venezuelan Speleological Society Member Carlos Bosque's ongoing research has found that many birds travel many kilometers beyond the cavern, and spend the night either in other caverns in the region or in treetops, sometimes up to three days at a time during their feeding trips, before returning to Guácharo Cave.

To portray the effects of Humboldt's impact on Guácharo Cave in a critical light contrasts with the celebratory tone of virtually all popular descriptions of his visit to the valley of Caripe. As current guides often state, while Humboldt did not discover Guácharo Cave, he certainly made it famous. During my time at Guácharo Cave between 2007 and 2008, I often walked to the area where local artisans sold their goods. There, I met a gentleman famous for his delicious traditional cakes and cookies made locally in Caripe, his life-long home. "People here give Humboldt too much attention," he told me during a conversation we had about the history of the cave. To our dismay, the belief Humboldt actually discovered the cave was very common, even among those whom we hoped would contribute to dispel such misinformation. A widely distributed newspaper publication produced by Caripe's Office of Tourism in 2008 included the error, prompting complaints (mine among them).

Within the complex and diverse "articulation of natures and histories" we must be traced to grasp more fully a place's natural history, some natures—indeed, some histories—bear more weight than others (Raffles 2002:7). The articulations of natures and histories at Guácharo Cave grew more complex: as more visitors penetrated its darkness with smoky torches, the birds and related ecologies had to adapt to more disruptions. Famed visitors signed their names on exposed walls. Fortunately for the cavern, few cave formation such as stalactites and stalagmites were accessible enough to become souvenirs. This is true within that first massive passage of the cave that extends 759 meters and ends in an impenetrable breakdown of rocks. Cave formations of astonishing beauty and well within reach lay further within the cavern, in sectors that would not be discovered and explored for more than 150 years after Humboldt's visit.

Humboldt's visit accelerated the desacralization of Guácharo Cave, from the perspective of the dwindling and increasingly assimilated Chaima community. Yet, from a different vantage point, the cavern was *resacralized* as a monument honoring a different set of characters and consolidating a different worldview that redefined the relationship between nature, culture, history, and the state. Instead of *Amanaroca*, many subsequent foreign visitors to the cavern paid homage to Humboldt and his European idealization and treatment of exotic nature. Guácharos became prized items for growing museum exhibits and private collections.

For the slowly consolidating class of European creoles with aspirations to emulate famous naturalists and, in some cases, spur the practice of science in the young American republic, Guácharo Cave became a perfect stage. Some retraced Humboldt's journeys, both figuratively and literally (Reig 2006/2007; Urbani 2005a). The cave's aura as national icon grew even stronger with another visit in 1835. While serving the Venezuelan government, Italian colonel and cartographer Agustín Codazzi visited Guácharo Cave. He traveled for the first time the actual tourist route (1,200 meters) and produced a widely circulated account of the experience (Codazzi 1974[1835]; Urbani 1999).

In the view of Venezuelan naturalists and government officials who shared Pérez Jiménez's vision of celebrating the "Venezuelan spirit" (Coronil 1997:168), Codazzi's visit further cemented Guácharo Cave's status as a site honoring the men who contributed to the making of the nation. Indeed, the cavern contained the three elements that were considered "fundamental sources" of this spirit: "history, religion, and popular culture" (Coronil 1997:168-169). The cave was a site with a long history of both indigenous and

catholic culture that the state reworked to fit its new national ideal. It did this while at the same time suppressing popular practices that escaped that vision (Coronil 1997:170-172). Thus, while the Pérez Jiménez government resacralized Guácharo Cave as the nation's first natural monument, it also transformed the physical and cultural landscape at great cost to the small community living next to the cavern. It also banned the practice of guácharo hunting, which continued (even if devoid of the ritual significance that Chaimas originally ascribed to it). Thus the creation of the Alexander Humboldt Natural Monument was another illustration of how

[t]he dictatorship's ambivalent attitude toward the popular sectors rendered more visible a contradiction at the heart of Venezuela's democracy which is covered by the state's celebratory discourse of the people: the construction of el pueblo at once as the foundation of the nation's sovereign identity and as a primitive mass to be shaped by the (more) enlightened elite. [Coronil 1997:172]

The cavern was resacralized in other ways as well: Until recently, catholic masses were conducted in its main passage. Visitors and explorers alike sometimes left religious icons deep underground as offerings, but also as signs of their feats. Moreover, for some current and past Venezuelan speleologists, a visit to Guácharo Cave could take the form of a pilgrimage. This could occur in various senses. It could take the form of a homage to a past speleological lineage, which might (or might not) include distinguished European naturalists. It could be an act that reaffirmed speleological alliances. For those who participated in those early years of fervent exploration, returning to Guácharo Cave and traversing its passages were and remain powerful embodied acts that stir memories of physical exertion, exploring alongside friends within a space that has barely, perceptively, changed.

Speleological Incursions into Guácharo Cave

The purported farthest passages of Guácharo Cave were not reached until 1957 (de Bellard 1957; Urbani 1999). Before then, exploration was slow. Several times the high levels of the cave's subterranean river turned explorers back thinking they had reached the end. These explorers continued to be European naturalists, but increasingly, Venezuelan nationals (urbanites from Caracas and local *cariperos* alike). Caripe guides had particular incentive to "push passages." Greater knowledge of the cavern gave them greater fame that they used to lure the most distinguished (and wealthy) visitors. The idea that some of them enjoyed the potential of exploring "new" cave, regardless of potential utilitarian benefit, also must be considered. This is a point to which I will return repeatedly in future chapters.

Key moments in the history of exploration of Guácharo Cave include German geologist Alfred Scharffenorth's visit in 1890. He is widely considered to have made the cave's next major exploratory breakthrough when he reached the cave's famous *Paso del Viento* (Wind Pass). However, recent research suggests that this distinction belongs to Venezuelan Ezequiel Gómez, who at the time of Scharffenorth's visit owned the land where the cave is located (Urbani and Furrer 2007). As a narrow and water-filled point of the cave, located at 1,041 meters from the entrance, the Wind Pass deterred many visitors for more than 50 years. In 1946 Caripe natives Víctor Ciliberto, Francisco Vera, Cirigliano, and Jesús Rodríguez crossed the Wind Pass, opening up a new period of cave exploration (de Bellard Pietri 1957; Urbani 1999, 2005a). They did this by completely submerging their bodies in water. The low level of the cave river left a small space by the ceiling of the pass for them to breath. There is no first-hand account of this event.

However, when I first faced the prospect of crossing the Wind Pass in 2008, I wondered what these men must have thought and felt standing where I was, with water up to my shoulders. The first person to cross Wind Pass would have had no idea what there was beyond that small, pitch-black opening in the rock. He would find out without the aid of a light source, since he probably did not have a waterproof headlamp. Thus, he would have had to rely on all of his limbs (hands, legs) to probe his way in the dark, water-filled passage, until, unexpectedly, the cave opened up again. What did he think and feel *then*? What prompted him to *go forth*?

In 1957, an expedition of the Speleology Section of the Venezuelan Society of Natural Sciences claimed to reach the cavern's end (de Bellard 1957; Urbani 1999). One of its founders and members, Juan Antonio Tronchoni, was part of the group that on April 17, 1957 reached the point in the cave believed to be the farthest from the entrance. This is a small room at the end of a long tunnel filled with large stone blocks. In a subsequent trip, the explorers placed a small statue of the Coromoto Virgin, a revered Catholic figure of Venezuela, at this site. It is now known as the *Salón de la Virgen* (Virgin's Salon) (SVE 1971).

On that day, Tronchoni was not alone. Expert Guácharo Cave guides Ramón Alén, and Jesús Rodríguez accompanied Tronchoni. Neither of them had ever reached this point of the cavern before. Rodríguez was of Chaima descent (Urbani 2005a:3). Notably missing from the group, however, was Tronchoni's close friend and Speleology Section co-founder Eugenio de Bellard. That day he was exploring another section of the cavern. In an interview a year after Tronchoni's death in 2007, his widow Dylcia Caires recalled Tronchoni's own account of that event (Caires, Interview, August 25, 2007). It

was one of the most extraordinary days in his life. Knowing how much de Bellard would have wanted to be in his place, he carved his initials, along with those of his good friend de Bellard, on the cave wall.

The Speleology Section of the Venezuelan Society of Natural Sciences

In the early 1940s, Juan Antonio Tronchoni met Eugenio de Bellard Pietri in Caracas. De Bellard had just returned from studying in France. There, he learned about speleology, and became enthusiastic about the prospects of pioneering this young science back in Venezuela. He and Tronchoni became close friends. They traveled frequently to caves around Caracas and then some further afield, such as Guácharo Cave (Fig. 2.4). Guácharo Cave, in particular, became an obsession for the two young men. On April of 1952, de Bellard, Tronchoni, and de-Bellard's half-brother Roberto Contreras founded the Speleology Section of the Venezuelan Society of Natural Sciences.

From the start, the Speleology Section's focus was the exploration and survey of Guácharo Cave. This was no coincidence. To push passages in Guácharo Cave was to retrace and go beyond the purported 472 meters that Humboldt and Bonpland reached in 1799. It meant surpassing the efforts of Italian colonel and cartographer, Agustín Codazzi. Further, this was the country's first natural monument. The fact that the exact dimensions of the cavern had not been determined, much less mapped, must have been an irresistible draw for the young *caraqueños* aware of their status as speleological pioneers in their country.¹⁸ Guácharo Cave became the perfect space to test their exploratory

¹⁸ The term *caraqueño* refers to a person from Caracas, the capital and by far largest urban center in Venezuela.

capacities and naturalists' sensibilities, much in the same mold as previous Venezuelan and foreign "Hombres de Ciencia" (Men of Science).

Beyond Guácharo Cave, the founders of the Speleology Section envisioned a project of national scope. All of the country's caves would be located, explored, surveyed, and mapped. This detailed registry would serve as a foundation for further speleological science. Despite the expressed nationalism in the Speleology Section's ambitions, its members did not deny or erase the European contributions to the making of Venezuela's "nature." Instead, they followed along their path, transforming the landscape with monuments of their own. In 1959, 150 years after Humboldt's death, the SE-SVCN honored the German naturalist by placing a marble plaque in Guácharo Cave at 472 meters from the entrance, the point where Humboldt claims to have reached during his 1799 visit (see Fig. 2.3). In many ways the gesture captured the ideological bent of the group, or at least, its leader. De Bellard wrote many articles on Guácharo Cave for both popular and scientific national audiences, as well as for the growing international speleological community (e.g., de Bellard 1951, 1957). His idolatry of distinguished European and creole naturalists is evident in these texts. In 1953 de Bellard presented a paper on the exploration of Guácharo Cave at the First International Congress of Speleology held in Paris. In contrast to Humboldt's presentations about his American discoveries to his European audience over 100 years before, de Bellard represented the efforts of the Venezuelan elite in producing and defining its own brand of natural history, adapting to regional circumstances and sensibilities the European model of speleology.

These efforts have interesting historical antecedents. Beginning in the 17th century, the profile of an authentically patriotic science was beginning to take shape

within Hispanic America (Cañizares-Esguerra 2006; Saldaña 2006). European and creole intellectuals and missionaries living in the colonies who increasingly felt identified with their viceroyalty led this effort. As several authors recently have stressed, the viceroyalties of New Spain were relatively independent from the directives of the Spanish crown (although the degree to which this was true varied throughout their long 300 year history). Thus, they ought to be viewed more as kingdoms, each with its own distinct identities, than as mere dependencies, for this is how their elite populations and leaders viewed them from within (Cañizares-Esguerra 2006:12). It is a mistake then to interpret the regional efforts to spur science in these territories solely as a desire to Europeanize them under the directives of the crown. Instead, regional players embraced—at different times, in different ways, and with different allegiances—scientific knowledge couched within the broader Enlightenment ideals as a way to promote viceroyalty identity and development. These “patriotic” efforts only intensified when travelers and naturalists from continental Europe (some of them never stepped foot anywhere in New Spain) began to promote theories of a (both physically and morally) degenerate and backward colony (Cañizares-Esguerra 2001, 2005, 2006; Saldaña 2006). I see the early enthusiasm of institutional speleology in Venezuela as intensely nationalist even as it embraced European speleological models that it would eventually reconfigure to fit its local conditions. This is true even as (or perhaps precisely because) several early SE-SVCN members were recent European immigrants who had fled war and persecution in their birth countries and were eager to make Venezuela their new home.

Viewed in this light, an interpretation of Humboldt’s marble plaque must go beyond that of the Speleology Section’s respect for European explorers and its embrace

of a particular kind of relation to nature and its history. This plaque also could be read as honoring the group's own efforts since its placement marks the point where Humboldt turned back and they carried on. It is a boundary point. Standing to read its text pays homage to the European naturalists' achievements, but also to their limits. Roberto Contreras, the last living of the three SE-SVCN founding members, commented of his half-brother de Bellard, "He was always stuck on these big scientists," a point that was evident in de Bellard's choices for naming caves throughout the country (Contreras, Interview, March 4, 2008). The marble plaque was a material instantiation of the group's attitude towards monuments, and the importance of their placement in nature. Moreover, the plaque honors so-called "Grandes Hombres de Ciencia" (great men of science) of which there are only few, and who demand respect and praise. To be a worthy scientist then, involved recognizing your forbearers, along with a hierarchy that extended to the members of the SE-SVCN. In the case of speleologists, to travel to Caripe to explore Guácharo Cave can be seen as a pilgrimage to the site where Venezuelan speleology "was born"— the physical efforts involved in traversing and surveying the cavern a tribute to a particular lineage, its particular ideology, a distinct set of practices, and the enveloping space that is both object and place of practice.

To many of the cavers whom I interviewed who eventually passed on to be, in 1967, part of the Venezuelan Speleological Society (SVE), these ideas in their extreme represented those of the old guard. These were ideas that the emerging SVE, particularly with the entry of a younger generation, would distance itself from since they were contrary to its spirit as an open, horizontal, non-elite, democratic, and above all, systematic and scientific organization. Moreover, this Society celebrated the

collaborative efforts of civic science, independent and autonomous of larger institutions, such as academies, universities, of even, religious organizations such as the La Salle Society of Natural Sciences. This new speleology, embodied in the Venezuelan Speleological Society, broke from the ways natural science was practiced in the past in Venezuela. Guácharo Cave was a key space where these transformations played out.

A Change of Leadership and a New Vision of Venezuelan Speleology

Young men of Caracas's elite class predominantly made up the active membership of the Speleology Section, which, until the mid 1960s, hardly ever surpassed 10. This befitted the identity of the Venezuelan Society of Natural Sciences, itself a prestigious organization of which de Bellard's own father, a medical doctor, was an honorary member. Among other early members was de Bellard's cousin, Eduardo Schlageter, the son of a wealthy Venezuelan painter of German descent. Tronchoni could not boast coming from a family of wealth. He was, however, like other early SE-SVCN members, a recent European immigrant whose family sought reprieve from their war-torn home countries. One early member, Ramón Alberto Hernández, was an important exception: he was neither a recent European immigrant nor part of Caracas's social elite. I will return to his story further on.

Few of the members of the Speleology Section were formally trained in science. De Bellard studied one year of medical school before switching over to law. Others, such as Carlos Tinoco and Marcos Sandoval, were bankers. Antonio de la Rosa, like Tronchoni, became an insurance agent. Raul Alvarado Jahn, the grandson of Alfredo Jahn, a revered Venezuelan scientist, had a degree in civil engineer. In 1957, Italian immigrant Carlos Bordón greatly enriched the group with his experiences as a caver in

his hometown of Trieste. Yet, as several of these early members recalled, Eugenio de Bellard dominated the direction and inner workings of the group.

De Bellard's influence changed in 1965. That year, Juan Antonio Tronchoni became the de-facto director of the Section since his friend de Bellard moved to the city of Maracaibo, located in northwestern Venezuela, to work as a lawyer for Shell Petroleum Company. Under Tronchoni's leadership, a number of important changes within the Section ensued. As summarized in its October 1965 report to the directive of the Venezuelan Society of Natural sciences, within that year the Speleology Section began its own library and published the first volume of *El Guácharo*, a bulletin dedicated to the dissemination of its activities to the wider public, and specifically, to other caving communities around the world. There also was a record number of attendees at its weekly meetings (from October 1964 to October 1965, the average weekly attendance more than doubled). This was the result of a new "open door" policy that put an end to the exclusivity of the Speleology Section. With this policy, Tronchoni and friends welcomed a new generation of high school and university students who would redefine the way speleology was practiced in Venezuela, and, in the process, the national cave landscape. At the same time, old friendships would be strengthened and new bonds of relatedness forged, many alive to this day.

A New Generation of Speleologists

Omar Linares and Wilmer Pérez began exploring and mapping caves in 1964. Both high schoolers at the time, they struck a friendship through their common love for science. Moreover, as each noted in independent interviews, they respected each other for their

timeliness and commitment to their planned fieldtrips. As members of the Sociedad de Ciencias Naturales La Salle (La Salle Society of Natural Sciences), they participated in scientific projects with field outings along the outskirts of Caracas and beyond. Linares was fascinated with bats. He learned about speleology from a copy of French caver Norbert Casteret's *Ma vie souterraine - Mémoires d'un spéléologue (My Life Underground – Memoirs of a Speleologist)* (1961) that he loaned to his friend Pérez. Casteret impressed the two young men. In libraries they “burnt their eyelashes,” in the words of Linares, reading over as much speleological literature as they could find. Most of all, they studied cave maps. According to Linares, they “taught themselves” how to survey caves by putting what they had read into practice. They then produced detailed maps that they used as a letter of presentation to the directive of the SE-SVCN. Indeed, the quality of their work is all they had to show (Linares, Personal Communication, September 19, 2011).

Neither Linares nor Pérez came from wealthy families. Pérez in particular was of very limited means. Both relied on public transportation to get to the outskirts of Caracas, where they had heard there might be caves. Once off the bus, they would ask locals if they knew of any caverns in the area. Some would accompany them in hikes to the mouth of caves. The two young men used battery-operated lanterns purchased in a hardware store. As I will describe at length in Chapter 4, basic cave surveying requires six basic tools: a tape measure, a compass (to read the horizontal direction of passages), a clinometer (to read their vertical displacement), paper and pencil to write these values and sketch the shape of the passages, and a light source. All of these tools are relatively easy and economical to purchase, making the economic and technological barriers to

speleological activity relatively low. This is a remarkable fact about speleology since it makes it a relatively accessible scientific activity when contrasted to other pursuits that might yield comparable “discovery” potential, such as deep water or space exploration.

Linares recalls that in their first cave outings, he and Pérez used

a field compass (very cheap), a tape measure—not too long—, and a barometric altimeter that Gordo Musso [a friend from the La Salle Society of Natural Sciences] [and then they would] take the information in their field books and then they would fix it up at home, to scale and all, with ink on paper... [Linares, Personal Communication, September 19, 2011]

Moreover, the *process* of cave exploration, with the body in constant negotiation with the unpredictable underground environment, appealed to Linares and Pérez since they both enjoyed the outdoors. Pérez in particular divided his time as a teenager (and since) between caves and mountains. But the degree to which the young explorers had to coordinate their efforts and help each other traverse the subterranean landscape was unmatched by the exploration of any other kind of geography. Thus, it was in the caverns of Caracas that an intense friendship, which lasts until this day, was forged between these two men. Much of its intensity and longevity, I suggest, has to do with the peculiar dialectic between scientific activity, the underground landscape, and the distinct sociality and embodied practices it engenders. But more on this in Chapter 4.

For now, I must stress how shocked Linares and Pérez were to receive an invitation from the directive of the Speleology Section to join their ongoing expeditions. They were shocked because they were very young, and neither had any connections to the Venezuelan elite. As I will describe further, Linares and Pérez were only the first of a number of young students who would soon swell the ranks of the Speleology Section, and shortly after, the Venezuelan Speleological Society.

The 1965 Guácharo Cave Expedition

Eager to finish a job that had dragged on for too long, in 1965 the Speleology Section organized a week-long expedition to finish surveying Guácharo Cave. It was a major operation that involved setting up camp within the cavern's largest room, the Gran Salón (Grand Salon), which measures 100 meters along its east-west axis and with the ceiling hovering between 10 to 15 meters in height (SVE 1971). With this effort, Venezuelan speleology elevated itself to the ways committed exploration was being practiced in other famed spots elsewhere, both above and below ground.¹⁹ Despite that in 1957 the purported end of Guácharo Cave had been reached, much surveying remained to be done, and many side leads had been passed up pending exploration.

Nineteen members of the Speleology Section participated in the 1965 Holy Week Guácharo Cave expedition. Linares and Pérez were among them. Veteran members Carlos Tinoco and Raul Alvarado Jahn were expedition leaders, while Tronchoni was equipment coordinator. Two months prior to the April event, the SE weekly meetings dedicated time for preparation. This included defining both the individual and collective equipment, coordinating who would contact both the public and private sectors for donations, and discussing topics such as the need for discipline during the expedition.

¹⁹ Setting up base camps led to important breakthroughs in mountaineering. Edmund Hillary and Tenzing Norgay had relied on them to reach the summit of Everest in 1953. Could similarly organized base camps, where explorers could refuel and rest while still remaining on task, help push the limits of subterranean passages? Swiss and Belgian speleologists pioneered this practice in 1949 during their exploration of Switzerland's Hollöch Cave, at the time the longest known in the world (Tschümperlin 2011). Aiming to surpass that record, U.S. cavers set up camp deep within the Flint Ridge cave system, just north of Mammoth Cave in Kentucky, in 1953 (Brucker and Watson 1987). These were events that the Venezuelan speleologists were aware of through the international cave club and society publications that they received.

They were able to secure a relatively low price for plastic bags from an ice company in Caracas (0.4 bolívares each). An optical store donated a compass and a jewelry store a chronometer. At the time the group also enjoyed a small monthly donation of 200 bolívares from the Ministry of Public Deeds, although this was short-lived. Linares was put in charge of determining and purchasing the required equipment for biospeleological research. Prior to the event members were also encouraged to purchase overalls that were specifically lined with an impermeable material in anticipation of the expedition. Echoing a militaristic tradition that characterized other famous expeditions such as pre-WWII Everest climbs, everyone would have a uniform (Ortner 1999:46-49).

The nineteen members divided into two groups, with the first taking off to Caripe from Caracas on April 9th in the group's Land Rover wagon (approximately an 8 hour drive). Once in town, the group drove up along the small winding road that led to Guácharo Cave. As already noted, even though the Monument had long been established, the infrastructure that would eventually alter the setting immediately beyond the cavern had yet to be built. The small hamlet of homes where several families lived was still there. The Salazar family in particular offered extraordinary support to the SE-SVCN expedition. As the *celador* (caretaker) of the cave, Ramón Salazar had been accompanying Venezuelan speleologists into the cavern and supporting their efforts since the late 1950s. By 1965, he was hired by the Ministry of Agriculture and Livestock that administered the monument.²⁰ One of Salazar's neighbors was the Magallanes family

²⁰ This ministry would go on to become the Instituto Nacional de Parques in 1973 (Reig 2003). After 1967, the speleologists (now as the Venezuelan Speleological Society) extended to Salazar official recognition as "collaborator."

(Fig. 2.5).²¹ The young Benjamín Magallanes, in his late teens at the time, proved to be the most valuable and dedicated local guide to the speleological efforts. This is mentioned in the official publication of the description of the explored and surveyed cave that appeared in two parts (the first in 1968 and the second in 1971) in the *Boletín de la Sociedad Venezolana de Espeleología*. Thus, unlike narratives about the cave such as Humboldt's, the SVE specifically named and acknowledged the contribution of key members of the local community to the speleological enterprise. As I will argue in Chapter 6, this was an important precedent to future attempts to enlist local support in both exploration *and* surveying efforts, and to do so in a way that challenged colonial hierarchies and unequal balances of power (or so was the hope).

In stark contrast to speleological expeditions a decade later, exploration in Guácharo Cave was *relatively* accessible. By this I mean that the car carrying explorers and equipment could be parked close to the cave's entrance (within approximately 200 meters).²² The total distance of traverse within the cavern from the entrance to the point of the underground campsite is just under 2 kilometers. Most of the passage connecting the two also is relatively horizontal, requiring some stooping and minimal crawling. There are, however, two points that challenge explorers with large amounts of equipment. The first is passing the almost completely submerged and narrow *Paso del Viento* (Wind

²¹ I examine the kin ties among Guácharo Cave guides in Pérez and Galindo 2009.

²² In an article that provides a retrospective view on the SVE's 55 years of exploration, the authors describe a shift in exploratory techniques and approaches to the geographical and geological challenges posed by unexplored caves (Urbani, Galán, and Herrera 2006:21). While the more accessible caverns (those closer to the road and/or requiring less technical climbing ability within) were explored first, later, exploring new caves became more physically and technically demanding. This in turn led to the rejection of the "old timers'" expedition style characterized by the use of voluminous and heavy equipment. I return to this topic in Chapter 6.

Pass) that I have already described. The amount of equipment (surveying tools, sleeping cots and hammocks, food, carbide for the headlamps) had to go through this point. Thus, the issue of how to keep everything dry was a technical challenge. Some creative solutions backfired. During a 2007 interview, Carlos Tinoco, one of the “veteran” members who joined the SE-SVCN in the mid 1950s and went on to found the SVE with Tronchoni in 1967, brought out his overalls with the impermeable lining (Tinoco, Interview, June 13, 2007). With laughter, he noted what a terrible idea that had been since the pockets would fill up with water and not drain. Old tire tubes and plastic bags were used to waterproof equipment. This was an improvement over the empty gasoline cans that had been used in the past to pack the supplies. The air within these containers made them float, requiring much effort to submerge them to a point along the pass wide enough that they could fit through.

Ramón Hernández remembered that the key to staying warm and energized, after several hours submerged in water passing equipment through the Wind Pass, was to take swigs of *chinguirito*, an alcoholic drink made with cinnamon, cloves, sugar, and rum that the families who lived in the hamlet in front of the cave prepared and sold to visitors (Hernández, Interview, October 27, 2007). Everybody drank chinguirito, including Linares and Pérez. Once past the Wind Pass, the explorers were both soaked and well within the non-tourist sector of Guácharo Cave. From there they continued to walk 100 meters along a relatively straight but low passage cut through by the underground river. The cave again challenged the group and its voluminous equipment at the *Piedra del Mecate* (Rope Rock), a slippery ledge, 5 meters in height. Once at the top of this pass, the explorers had to push their freight along a small tunnel that required they squirm along on

hands and knees. Once through, they had arrived at the Grand Salon in time to set up camp and begin the work of dividing up the work ahead.

Tensions Rise Within Guácharo Cave... and Shake Up Venezuelan Speleology

Since he had left Caracas to work in Zulia and Tronchoni had become the director of the Speleology Section, de Bellard had distanced himself considerably from the activities of the Speleology Section. According to fellow cavers, these activities increasingly upset him. SE-SVCN member Carlos Bordón explained that among de Bellard's concerns was the entry into the Section of many young members whom he considered anarchists and communist (Bordón, Interview, August 22, 2007). Bordón conceded that in part he was correct. He noted that among the new members was Oscar Garbisu, Pérez's partner in the 1967 month-long Guácharo Cave expedition. Bordón noted that at the time he was an aspiring photographer who had broken into a photography store to steal some equipment. Moreover, Venezuelan politics in the 1960s were charged with the potential threat of communist revolt. As the Venezuelan cavers knew well, speleologists and speleological knowledge had played a role in the success of the Cuban Revolution (Forti 1998).²³ The last thing the conservative de Bellard wanted was his Section infiltrated with revolutionaries who would use the country's underground as bases for operation.

On 1965, the Speleology Section members voted on their new officers. De Bellard was demoted from director, a post that he had held since the founding of the group in 1952, to "Equipment Keeper." This must have been a blow for a man who, based on the account of many (including his daughter, a staunch defender of her father's life

²³ See Chapter 7.

achievements), considered himself the founder of Venezuelan speleology (De Bellard, Personal Communication, March 2008). To Bordón, de Bellard's "egocentrism" contributed to the fallout in his friendship with Tronchoni and the eventual creation of the Venezuelan Speleological Society in 1967.

Events that transpired on that 1965 expedition to Guácharo Cave gave further momentum to these transformations. Eugenio de Bellard had not been part of the expedition planning since he was already in Maracaibo. Yet, he traveled to Guácharo Cave, unannounced, when work at the cavern was ongoing. Pérez recalled that de Bellard "became upset [once he arrived] because he expected that we would all stop working and greet him like a king" (Pérez, Personal Communication, 2008). According to Pérez, de Bellard complained that some "caga-leches" (milk-poopers) had been put to work on the cavern's speleological project.²⁴ Several others who were present at the cavern that day echoed this description and interpretation. Ramón Hernández, however, offered a different perspective: "De Bellard felt very hurt that he was placed to work as a subordinate instead of as director" (Hernández, Interview, June 25, 2007). Indeed, Hernández would eventually abandon the newly formed Venezuelan Speleological Society after, in his words, he "found out what actually happened from the mouth of de Bellard ... I could not abandon him." The fact that de Bellard, according to Hernández himself (and confirmed by others), paid him for his speleological work must have affected this allegiance. As already noted, of the early members of SE-SVCN, which included several men of very wealthy families, Hernández was among the least formally

²⁴ With the term *caga-leche* de Bellard referred dismissively to the young age of the Speleology Section's new members (they were not full members yet, but *colaboradores* (collaborators)). Pérez and Linares were, respectively 15 and 16 years old at the time.

educated and the poorest by far. "We formed a great team, a symbiosis: He collaborated with me with expenses, with transportation, and I collaborated with him with photographs, with written reports, with the actual exploration," Hernández told me in 2007.

Differences in leadership styles and visions between de Bellard and Tronchoni culminated in the suspension of the Speleology Section and the creation, in 1967, of the Venezuelan Speleological Society, which all active members of the Section joined.²⁵

Two Leadership Styles, Two Visions of Speleological Science

The contrast between the leadership of de Bellard and Tronchoni epitomized the contrast between the traditional and new form of practicing natural science in the country. De Bellard's dominant personality played a role in his leadership style of the Section, a point that both friends and foe have stressed. Yet, Tronchoni also had a strong personality, and his leadership style, which favored a collective, non-hierarchical, and open project, differed immensely from that of his friend de Bellard's. This difference could be better appreciated in terms of the two men's vision of Venezuelan speleology. De Bellard considered himself the pioneer of Venezuelan speleology, which, if we consider his role in fomenting the idea of the creation of the Speleology Section based on his experiences in France, is true. But more importantly, he cast the structure and activities of the Section in the mold of traditional natural science institutions in the country. The cult of "Great Men of Science" dominated these institutions that were, by definition, exclusive organizations that only a select few could join. That these members also were part of the

²⁵ De Bellard was not an active member at the time, although he remained part of the Board of Directors of the mother institution, the SVCN.

Venezuelan social, economic, political, and racial elite was no coincidence. They were individuals whose “proper moral and civic character” was deemed fit to engage in scientific pursuits, generate scientific knowledge, and thus forge paths of national progress.²⁶ They also were friends who partied together, attended each other’s weddings, and became godparents’ to each other’s children.

Understanding Tronchoni's fervent support for speleology as a scientific pursuit, despite him not being a scientist himself, must be considered in the context of Venezuela's modernizing project that began, mainstream Venezuelan historiography has it, in 1935 and intensified in the 1950s and 1960s.²⁷ This intensification benefited from two key factors: a wave of skilled European immigrants and the drastic increase in oil income. This modernization involved the creation and expansion of an educational and industrial sector that promoted scientific and technical pursuits viewed as critical for national development (De la Vega and Vessuri 2008). Based on his editorials and accounts of those who knew him, it is not far-fetched to presume that Tronchoni viewed

²⁶ Historians of science have explored link between the production of scientific knowledge, morality, and even bodily capacities and dispositions. Shapin and Schaffer powerfully illustrate the link between such a judgment and a person's perceived capacity to produce credible knowledge (1985). In the mid 1600s, Robert Boyle confronted the problem of recruiting divers to conduct his hydrostatical experiments. On the one hand, they had to be skilled and sturdy enough to bear the stresses of deep-water diving. On the other, they had to be persons worthy of trust, if their testimony of their bodily experiences underwater were to be believed. As Shapin and Schaffer show, precisely who counted as trustworthy depended on their social status, as defined within English society. In the context of the history of science in colonial Iberia and Spanish America, Cañizares-Esguerra highlights the “chivalric” model of science that dominated in the 17th century. This model presented the "cosmographer as knight, or the knight as cosmographer" whereby adventures involving risk in the search for knowledge and truth were the mark of gentlemanly valor (Cañizares-Esguerra 2006:10).

²⁷ Venezuela’s longest ruling dictator, Juan Vicente Gómez, died in 1935. This event was followed by radical social, political, and economic changes in the country. Julie Skurski (1993) cautions against this linear reading of national history that cast Gómez as backward and his followers as enlightened modernizers.

university youth's involvement in speleology as contributing to nation-building.

Underlying this view was his national politics. Another SVE member who joined the Society when he was 14 years old, noted that "Tronchoni was an 'Adeco,' a supporter of the political party "Acción Democrática" (Interview, June 28, 2008). This party, founded in 1941, emphatically aligned itself with social movements that promoted participation by all members of society (Coronil 1997:145). This association would later change, as the party gained power as part of a political apparatus increasingly delinked from the realities of most Venezuelans. Yet, in contrast to others' beliefs in politicians as essentially corrupt individuals, "Tronchoni promoted honesty, good character, responsibility." He also promoted camaraderie by expanding the spaces of scientific sociality into restaurants and very often, his own home.

Tronchoni was, and remained until his death in 2007, deeply concerned with the problem of recruitment to the Society. Although he strongly urged that the SVE recruit members from universities, the group welcomed anyone willing to practice speleology as a collaborative scientific project of national scope. I argue that the organization provided a space for the development and practice of civic science that circumvented, and in effect rejected the elitism of Venezuelan scientific academies such as the Venezuelan Society of Natural Sciences. Researchers have examined the emergence and popularity of nature societies in 19th century Europe, highlighting how, as markers of a growing civil society, they contributed to the popularization of science, the democratization of educational opportunities, and the development of touristic travel and associated sensibilities of a budding middle class (Jardine and Spary 1996; Kennedy 2008; Secord 2002; Withers 2003; Withers and Finnegan 2003). Withers and Finnegan (2003) use the term "civic

science" to describe the activities of natural history societies in Victorian Scotland, arguing that an examination of these organizations' practices (field activities, the creation and maintenance of field museums and publications, the formal and informal gatherings to discuss group activities, community outreach, etc.) offer insight into 19th century Scottish notions of civic worth. This worth was premised on producing local natural knowledge, which effectively contributed to the consolidation of regional and national identity through scientific pursuits.

Investigating the existence of equivalent "associational activities" in Latin America is beyond the scope of the present research. Exhaustive search of the literature has yielded little. It appears that both in colonial Spanish America and in the independent emerging nations, science was an activity of individual elites, both European and creole alike. The closest reference to civic "associational activities" that I found were the early societies of friends of the nation that organized independently of imperial (including viceroyal) support (Lafuente and López-Ocón 2006:132; Saldaña 2006:59). These societies brought together polymaths, naturalists, collectors, and entrepreneurs who shared a concern for the modernization of their viceroyalties, which they thought of as independent kingdoms. Of course there were many collective efforts to promote science in the regions. Missionaries and imperial *técnicos* lead their own natural science campaigns, with the latter responding to a viceroyal commitment to know the land and its resource that got a strong boost during the reign of the Bourbons. Virtually all of the constitutions of the emerging independent states were drafted, the idea that the state should promote science for the public good and welfare of the nation (Saldaña 2006). This was the beginning of a relation in which science would become increasingly

politicized. This certainly has been the case of Venezuela, with some scholars noting its recent intensification during the Chávez presidency (Vessuri 2006).

In Venezuela, at least until the early 1940s, science was a pursuit of individual men who had both the economic and social capital to pursue their interests (Ruiz Calderón 1992; Texera Arnal 2002, 2003). American immigrant William Phelps, who settled in Venezuela in 1875, is credited with founding ornithology in the country (Texera Arnal 2002). U.S. trained botanist Henri Pittier (1857-1950) pushed for the establishment of this discipline in the country, as well as conservation projects that predated government policies of its kind (McCook 2002). The Academy of Physical, Mathematical, and Natural Sciences, founded in 1917, and even the Venezuelan Society of Natural Sciences, founded in 1929, had restricted memberships to such "individuals of science." Membership to the Academy, in particular, was limited to a small number of individuals (Carrillo 2003). As I will describe later, de Bellard eventually joined this organization with his publication of a Venezuelan cave registry (de Bellard 1969), a work that many SVE members criticized and dismissed as lacking scientific rigor.

The Venezuelan Society of Natural Sciences organized into several sections, each dedicated to a specific scientific endeavor (the Speleology Section among them). Sections were created around a common goal, attempting to channel members' collective effort in the advancement of a scientific project of national scope. Still, the social weight of the personalities that it counted as founders and directors often overshadowed or impeded the materialization of such collective ideal. Moreover, it kept the organization accessible mostly to men of Caracas's high class.

In 1943, Spanish monk Pablo Mandagen Soto (Brother Ginés) founded the La Salle Society of Natural Sciences, a sister organization to the men's school La Salle, where several of the second generation of young SE-SVCN members first received their scientific training (Pereda Núñez 2007). This organization was the first in the country to promote scientific pursuits among the youth, with an emphasis on fieldwork and research publications. The La Salle Foundation of Natural Sciences was subsequently created in 1957, the "daughter" organization of two institutions (one scientific and one religious): the La Salle Society of Natural Sciences and the La Salle Brotherhood. Similar to the La Salle scientific institutions, the creation of the Venezuelan Speleological Society, with its emphasis on the promotion of science among the youth, marked a categorical break from the organizational traditions that had dominated Venezuela until then (Pereda Núñez 2007). The SVE, however, was exceptional in several respects. First, it did not limit its membership to young men. The La Salle Foundation of Natural Sciences aimed to become a professional organization, thus primarily hiring scientific academics to lead its projects of national scope. This was not the case for the SVE, which has and remains a voluntary organization, where no one is paid. Third, the La Salle organizations were an extension of a much larger and resourceful institutional and ideological fabric: the La Salle Brotherhood. This parent organization defined the general course of the research agendas of its affiliated groups. In contrast, the SVE was intellectually autonomous—it members decided for themselves what and how they would research. To SVE member Francisco Herrera, who was part of the group from the 1980s to 2011, this point in particular makes the SVE an extraordinary phenomenon. Moreover, the land upon which the La Salle Foundation was built was part of the La Salle school. By abandoning the

institutional umbrella of the Venezuelan Society of Natural Sciences (and in the process alienating the members of its directive), the SVE was utterly alone, independent and autonomous—yes—but alone.

The SVE incorporated a new generation of young students, most from families of modest economic resources, some highly identified with leftist politics. Several were interested in careers in science, and saw their affiliation with the SVE as a way to further their interests through fieldwork and original research. Most of all, however, new members were attracted to the exploration of caves and the camaraderie this experience afforded. Soon friends of friends joined as well, first as aspiring members, adding to a social diversity (in terms of age, class, political views, educational, and career achievements and pursuits). This diversity was rare in civic associational activities of the time, but certainly unique among organizations aimed at a scientific project of national scope. More radical still, the group's leadership (Tronchoni, Tinoco, Sandoval, Bordón, and others) promoted this project under the banner of a collaborative organization—*la Sociedad*—that aimed to outdo and outlive any single individual. This was possible, Francisco Herrera noted, because the SVE's founders put into practice the odd idea that the leader need not be the expert. This he contrasted to de Bellard's leadership style, which followed a military model (Herrera, Personal Communication, August 12, 2011).

Although Herrera joined the Society twenty years after its founding, his view of these early years interested me, particularly as they contrasted to the organization's more recent challenges. Herrera also was keenly committed to the collaborative mantra of the Society's livelihood, which to him, as to many others, comes alive in the field. Hiking in the Mata de Mango region south of Caripe, Monagas, in 2002, Herrera stressed the

educational and moral value of group expeditions in the field. Such experiences promote a first-hand knowledge and respect for nature as well as the value of teamwork. "It should be part of everybody's education," I recall him saying, an opinion that he would restate during an interview five years later.

Pondering on the beginnings of the SVE and the career profiles of its founding members, it occurred to me that the group could have adopted a more exploratory focus, emphasizing field experience and not worry about publishing results. Like many other caving groups in the world, it still could have carried out systematic surveys, and even conducted some speleological research. Its work could have been published in a club magazine of limited circulation, their more scientific work sent off for publication in an established speleological journal of broad readership. That is the case of most cave clubs or "grottos" in the United States, each affiliated with the National Speleological Society. This organization publishes its national monthly *NSS News* that features a brief summary of grotto activity based on these club's reports. Unlike most caving organizations in the world, it also has a scientific peer-reviewed journal, *The Journal of Cave and Karst Science*, one of the world's premier speleological publications.

In Herrera's view, two key factors help explain Tronchoni's commitment to a national scientific cave project, which included an ambitious publication with peer-reviewed articles and the national cave cadastre. First, Tronchoni took on the challenge of outdoing the institution he left behind, the Venezuelan Society of Natural Sciences. "He challenged institutionality with even more institutionality... He had to be better than the table he kicked; he had to do more and do it better," Herrera stressed. Second, Tronchoni wanted to create an institution that would endure, and given the scientific boom of the

Venezuela of the 1950s and 1960s, he must have realized that creating an organization with scientific foundations would have a better lasting chance. There is an irony here, the idea of raising the stakes of an organization to ensure its survival. Yet, reflecting on the many interviews with SVE members, on hours either in the field or in the SVE premises, there is a palpable sense of pride in the group's achievements, and thus a resistance, a refusal to let it die.

And yet, as Herrera and many others who knew Tronchoni stressed, Tronchoni's vision of a collaborative speleological project, focused not on individual feats but on teamwork organized in a non-hierarchical and open manner, cannot be explained as a symptom of changing times. What Tronchoni did, to dedicate so much of his life to promoting speleology, to promoting *la Sociedad*, without care and indeed disdain to possibility that his own person become an icon of national speleology, remains a rare exception. As Herrera put it, "People like that don't exist, especially not in this country" (Herrera, Personal Communication, 2008).

At the risk of simplifying and misrepresenting the characters of two complex men, one whom I did not know personally but earned the respect of many (de Bellard) and another, whom I grew up loving as a charming godfather (Tronchoni), I have chosen to cast their visions of speleology in the context of Guácharo Cave's natural history. Here, personal and underground geographies and histories are inextricably linked. I see parallels between de Bellard's vision of speleology and his role in it and the celebrated monumentality of Guácharo Cave as a sacred site of the "Great Men of Science," Humboldt in particular. While there is no physical monument at Guácharo Cave honoring his contributions directly, he led the initiatives in creating monuments to Humboldt that

greatly altered the experience of the site (both the marble plaque and large cement structure that crowned with Humboldt's statue that I have already described above).

Even after he gave up cave exploration, de Bellard remained dedicated to Guácharo Cave. According to his daughter, who moved to Caripe from Caracas in 2007, one of her father's life-long ambitions was to make the cavern a World Heritage Site. "This is an ambitions I hope to fulfill in his memory," she told one evening as we lay on our backs on the cement steps her father had designed and commissioned. It was getting dark. There we waited as the guácharos started their nightly exodus to search for food, with a stony Humboldt keeping watch nearby.

Tronchoni also returned to Caripe repeatedly after he retired from cave exploration. He was involved in several efforts to promote speleological knowledge among Guácharo Cave guides. He also purchased a piece of land in downtown Caripe that he hoped would be the site of a regional speleological center. Few current cave guides remember him, although many more do remember de Bellard. Tronchoni was less interested in the monumental projects that preoccupied de Bellard. And yet, he was a critical player in the production of what is arguably the most important and ambitious icon of Guácharo Cave: a map featuring the cavern's 10.2 kilometers of explored passages. This map hangs in the small museum that only a fraction of the visitors to the cavern enter to see. The map represents a vision of the cave unlike any other in its long geological and cultural history. The collaborative effort that eventually resulted in its production was unique in the history of Venezuelan science. No names of individuals are listed on that map. Instead, the fading purple ink of a stamp at the lower right-hand corner of the yellowing paper reads: Sociedad Venezolana de Espeleología.

Guácharo Cave is Mapped... but Mysteries Remain

The Venezuelan Speleological Society's efforts to explore and map Guácharo Cave culminated in 1970, reporting 10.2 kilometers of passages. This value disappointed some veteran cave guides who embraced the hope that there was some truth to the myth that the cavern went all the way to Brazil.²⁸ Still, the 10 kilometer mark made the cave the longest in the country, a distinction it held until the end of the 1980s, when further exploration revealed longer caverns in northwestern Venezuela. The SVE published the Guácharo Cave maps, alongside thorough descriptions, in its new publication, the *Boletín de la Sociedad Venezolana de Espeleología*. This was done in two parts. The first, which appeared in 1968, corresponds to the first 1,200 meters of passage, the sector accessible to daily guided tours (SVE 1968) (Fig. 2.6). The remainder was published in 1971 (SVE 1971). This second fifteen-page report includes two fold-out pages. The first contains six color photographs highlighting some of the most beautiful cave formations. The second features the detailed map of the remainder of the cavern (Fig. 2.7 and 2.8). Care is required to unfold the map. It is delicately inserted and glued into the middle of the SVE's bulletin, which is 16.5 by 23 centimeters, half letter-sized. To fit the entire map within its

²⁸ This belief might be traced to a number of sources. According to long time Venezuela Speleological Society member Franco Urbani, who has meticulously researched the history of cave exploration in Venezuela, this myth probably originated with European botanist Nikolaus Funck's 1844 description of his visit to Guácharo Cave. In it he suggests the possibility that the oilbirds traveled as far as Brazil in search for food (Urbani 1999:53-54). De Civrieux also notes a belief among some of his Chaima informants that the cave might reach much farther than any man can ever know (De Civrieux 1998). These fantastic underground geographies echo a culturally and historically widespread conception of caverns as connectors to subterranean worlds (Williams 2008[1990]). Whatever their source, not knowing where a cave might lead only fuels its ambivalent character, its mystery.

dimensions, it has to be folded onto itself 6 times. Fortunately, the paper is of good quality and weight, every detail of the delicate lines of the survey clearly visible on its semi-gloss finish.

The map includes all of the elements that are considered standard for cave maps today: a title, an orientation arrow, a scale (8cm=100m), and both a plan and side view of the cavern. The plan view provides a perspective "from above," a view that would result if the mountain which contains the cavern were sliced along a horizontal axis, as in a layered cake about to get its filling. Guácharo Cave is predominantly a horizontal cavern, making this visual projection a very "complete" one. But the foldout also includes the cave's side view, or profile, as well as cross-sections that provide the map-reader added information about some of the most distinguishing passages. The side view slices top-down along the length of the cavern, this time cutting a serving slice from the cake. Plan and profile views are perpendicular to each other (Fig. 2.9 and 2.10). Cross-sections provide the same view that a doctor uses to show a patient the severity of a clogged artery; it slices the passage from top to bottom at an angle perpendicular to the main length of the cave passage (refer back to Fig. 2.6).

Cave explorers often are the be the first to acknowledge the limits of cave surveying and mapping in the quest to fully know and bound their object and place of study. This limitation of cartographic representations is not unique to cave maps. It is, arguably, characteristic of any map, a point that social scientists have stressed in their critical examination of cartographic practices, but is often and easily forgotten (Cosgrove 1999). Yet, in the case of cave maps, this indeterminacy is often symbolically expressed

in the representation itself.²⁹ And this is not just an artifice of the surveyor and cartographer. It is a symbolic marker of the metaphysical *fact* of caves as dynamic and porous places underground that can only be explored so far. Cave explorers grow to appreciate this reality through their experiences in the ground. Their ability to represent the cave rests on their knowledge of it. In turn, this knowledge depends on their ability to traverse its passages. As I further explain in Chapter 4, cave explorers and caves are mutually constituting: just as exploring caves makes an individual a cave explorer, caves themselves are revealed—indeed, *defined*—by explorers' ability to pierce their darkness with their bodies and lighting technologies.

Prior to my own visit to Guácharo Cave's non-touristic sector in 2008, I studied its maps intently. I noticed that at some points on the maps, the ends of passages are left open, with a question-mark (Fig. 2.11). These symbols index *going passage*. At these points, the cave does not close off, but keeps *going*. Explorers who were part of the 1965 expedition and subsequent efforts to finish off the survey of Guácharo Cave conceded what is a reality of cave exploration everywhere: that at some points, the probing body must turn back, either because it does not fit or because of other obstacles such as delicate formations that are deemed too valuable to justify their destruction for the sake of pushing the cave. But there is more.

The written description of the cavern mentions two galleries, the *Salón Agustín Codazzi* and the *Galería Negra*, that are not represented in the maps. It states how in 1961 a group of 7 explorers were able to squeeze through a tight fissure and make their way into what they consider to be "the two most beautiful rooms in the cave" (SVE 1968:

²⁹ See Chapter 4.

105). Not only were they of great beauty, with cave formations as formidable as they were delicate, access to the rooms could be dangerous. Concerns for the conservation of these galleries lead to excluding them from the final maps! That the textual description of the cavern does mention them suggests the cavers' attempt to offer a complete account of exploration, one that, presumably, would not be as replicable or easily accessible as a map, and thus less likely to lead to vandalism or negligence.

Thus, even the SVE speleologists, with their new vision of nature, with their radically new way of conceiving and practicing science in Venezuela, with their new way of representing the underground, have not succeeded in revealing Guácharo Cave completely. Even more surprising, *they concede the limits of their own labor in the very maps they produce*. This creates a tension that I will address further on: the tension between revealing and concealing, between sharing knowledge and secrecy. Several Venezuelan Speleological Society members remain certain that there is more to explore in Guácharo Cave. Yet, too much time had been spent there. Caverns all over the country beckoned. By the end of 1970, it was time to move on.

Conclusion

The qualities that stamp Guácharo Cave with its ambivalent character also spill over into the efforts of naturalists and speleologists, despite their differences, to reveal their object and place of study. A fuller appreciation of Guácharo Cave's natural history, then, must acknowledge its resistance at being completely revealed, stabilized, bounded. These qualities come into being as bodies traverse the cavern's passages. This is true not just in the efforts to represent it, but also, to explore it. But even if fully explored, is it fully

revealed? A cavern changes with every drip of water at the end of a stalagmite that leaves a speck of calcite on its tip and then falls and grows the stalagmite below. It changes with the rumbling of tectonic plates, with an active earthquake area located to just north along the Caribbean coastline. As acidic water continues dissolving away, blocks of limestone shift and fall. Both moving water and air erode the stone as well. And the guácharos. Might the growing threat of deforestation, even within national park land, diminish their nutritional sources to the point that they might not find living in the cavern sustainable? Without them a great variety of organisms that depend on the bird's guano and regurgitated seeds would disappear.

To come back to Guácharo Cave is to come back to a different place. Time does not stand still there. In fact, it does not stand still *anywhere*. Yet, relative to any space, any corner on earth, caves are among those where the rate of change is slowest. Enclosed and protected from outside turbulence, some caves have offered the perfect environment for species to escape from and survive climatic changes. They have adapted to their new environment by losing any pigmentation, losing their eyes, radically slowing their energy expenditure, and extending their lifespan. Yes, space is a product of interrelations, with many stories and paths coexisting within its sphere, and it is always under construction (Massey 2005). *And* its materiality mingles, collides, shapes, and in turn is shaped by qualities resulting in peculiar and distinguishing albeit ever changing characteristics, which, in this project, I examine and explore underground.

In this chapter I have considered the histories, the aspirations, and the motivations of a few who have trekked in those portions of the cavern that have yielded to human incursions. In particular, I have focused on a number of protagonists in the origins and

eventual consolidation of Venezuelan speleology. I have proposed a reconsideration of Guácharo Cave's natural history in light of speleologists' efforts both to honor past naturalists and to move beyond them. As I have shown, these efforts are echoed in different relations, ideological, material, and even affective, to monuments. I have aligned the early efforts of the Speleology Section of the Venezuelan Society of Natural Sciences (and its founder and director Eugenio de Bellard Pietri) with a monumental stance at home with the traditional and institutional view of science as the domain of "Great Men." In contrast, the creation of the SVE, marked a break from this view. To Juan Antonio Tronchoni, speleology ought to be a project of national scope that spurred the involvement of youth in science. The SVE became a unique space where young men (and eventually some women) could participate in a collective effort that was open, and democratic. A closer look at cave mapping itself further reveals the intensity of relations forged through its practice. These relations, in turn, made speleological science possible.

Chapter 3

Producing Speleological Knowledge, Producing Society: The Cadastre as Boundary Object

During the Holy Week break of 2008, the Venezuelan Speleological Society again skipped the sun and headed to the heavily forested mountains of the Monagas state in Eastern Venezuela in search for caves. This was my third expedition with the group, and, just as in the two previous cases, it featured a diverse cast of members. There was SVE president Joaquín Astort, a Spanish immigrant who started caving as a teenager in his native Spain, and continued his hobby alongside his job as an engineer at the Caracas Metro; Francisco Herrera, an ecology researcher employed in Venezuela's premier scientific institution, the Instituto Venezolano de Investigaciones Científicas (the Venezuelan Institute of Scientific Investigations, or IVIC); Luz Rodríguez, an earthquake geologist from the Fundación Venezolana de Investigaciones Sismológicas (Venezuelan Foundation of Seismological Research, or FUNVISIS); Maribel Ramos, a biologist working on a research ecology project that Herrera directs at the IVIC; Juan Acosta, an electrician from the Metro of Caracas; Carlos Galán, a biologist working at La Sociedad de Ciencias Aranzadi (the Society of Sciences Aranzadi), a research institute in northern Spain; Galán's wife, Mariam Nieto; and myself. Ages ranged from 31 to 60. Of the group, Carlos Galán was by far the most experienced caver, particularly in this region of Venezuela, which he has been exploring since the early 1970s.

During the first four days we hiked the mountains of the Alto de la Palencia region in search for caves that had yet to be explored and surveyed.¹ This effort resulted in four new cave entries into the National Speleological Cadastre, or cave registry, that the Society has been contributing to and managing since 1967 (SVE 2003:45-49). At one of the caves, a curious geological sample and a small crab were collected as specimens. On our return to the town of Caripe, we visited a cavern that had been surveyed in the 1970s. The goal was to determine whether or not it still harbored a previously reported crab species. We carefully waded along the low water of the cave's long and narrow passage, straining our eyesight, making the best use of our flashlights and headlamps. No crabs. Had we scared them away as we invaded their otherwise peaceful home, or had the population known to exist vanished?

Asking such questions, searching for biological specimens, exploring, and surveying caves, all members of the expedition, professional scientists and non-scientists alike, *did* science. Their collaborative effort continued back in Caracas (or Spain, the case of Galán), drafting trip reports, analyzing samples, producing the final versions of the cave maps based on the survey notes. The Society's publication, the *Boletín de la Sociedad Venezolana de Espeleología* now features the results of these collaborative efforts, as it has done, to varying degrees of participation and intensity, for over 40 years (SVE 2003:45-49). While many things have changed (membership is smaller, caves explored are increasingly farther and more difficult to reach, the style of exploration is different), some constants remain: the diversity of the participants and the commitment,

¹ We were not alone. The group counted on the knowledge of expert mountain trekkers of Chaima descent who sought out caves to hunt guácharos. I will explore the relationship between the SVE and Chaima descendants in Chapter 6.

at least of a critical few, to speleology as a collective endeavor necessary to keep the publication, and thus *la Sociedad*, alive. What, precisely, fuels this project? What brings such diverse group together?

To answer these questions I suggest thinking of the production of the Society and speleological knowledge dialectically. Making sense of this dynamic relation requires attending to the specific forms this speleological knowledge took during the SVE's first years after its founding in 1967. During this time the group's key foundations were established: the creation of its *Boletín* and the definition of the national cadastre. As I will show, this publication, which contains the cadastre, is not just the material instantiation of scientific knowledge and practices. These practices, which take place in the field, in the SVE headquarters back in Caracas, and even in members' homes and restaurants, not only bring together the diverse cast of members that characterized the 2008 Monagas expedition. These practices in effect *create a space* within which an alternative mode of science is possible (or at least imagined). This is a mode of science that is collaborative and accessible (at least in theory) to anyone eager and willing to explore caves. Building on the argument of Chapter 2, this also is a space in which an alternative geography is produced and enacted that deviates from the monumentality of both sites and "Great Men of Science" traditionally celebrated in Venezuelan history of science and of the nation.

In 1989, sociologists Leigh Star and Greisemer proposed the concept of "boundary object" to help explain how actors with diverse views collaborate to produce scientific knowledge.² Boundary objects are "scientific objects which inhabit several intersecting social worlds *and* satisfy the informational requirements of each" (Leigh

² The version of the article I use here was reprinted in 1999 in *The Science Studies Reader*.

Start and Greisemer 1999[1989]:509). Similar to the case these scholars analyze (the creation of a natural history museum), the growing and increasingly diverse membership of the SVE faced the potential challenge of collaboration. In the case of the speleologists, however, I argue that the cadastre worked as a boundary object in its capacity “to inhabit several intersecting social worlds” and satisfy the informational *and experiential* sensibilities of each. This capacity is premised on the fact that the registry was a registry of cave maps. As I will explain in Chapter 4, to map a cave entails its exploration. For those committed to speleological science, a national cave registry of properly mapped caves was critical for the group’s identity as a scientific organization. For those less aligned with this scientific imperative, the production and growth of a national cave registry depended on more exploration of more caves in diverse regions of the country. I do not want to give the impression that the “scientists” cared first and foremost for maps and that the “non-scientists” were in it for the experience of exploration. Neither of these labels or descriptions fall into static categories. Arguably *all* members of the Society joined the group at least in part because of their attraction to the experience of cave exploration. However, that they did so (and as long as they did) as part of *la Sociedad*, required their commitment to each other, and thus, the national cave registry project. Moreover, and in true dialectic fashion, the systematic knowledge of the cave landscape that the cadastre afforded often made visible potential new horizons (and depths) of exploration.

The dialectic between Society and speleological knowledge in the form of the cadastre manifested itself in other ways as well. Early debates about who should manage the cadastre and how reveal efforts to better define the identity of the Society and even

establish it as national arbitrator of speleological knowledge. In some ways these efforts resemble the standardization and protocols that Leigh Star and Greisemer see critical in the process of collaboration about differently positioned actors within (and at the margins of) the natural history museum community (1999). In their case, these “methods control” tactics worked as reconciliatory tools because they focused on the how and not the more contentious and value-laden why (Leigh Star and Greisemer 1999[1989]:516). Not so in the case of establishing the cave registry standards. This is evident in debates regarding the naming of caves. As I will show, these debates sometimes resulted in divisions—not reconciliations—within Venezuela’s speleological community. Human geographer Sara Cant’s 2006 analysis of the ways British speleologists handled the pooling of speleological data during the 1930s and 1940s will serve as a counterpoint to the Venezuelan case I develop here.

My focus on the cadastre is not just about the production and definition of *la Sociedad*. The national cave registry redefined caves from iconic sites that were important for what they contained or who had visited them to regular geological phenomena added to an archive, a network of many others of their kind. Here the language of science helped redefine caves. As one SVE member emphasized, this system made all caves valuable, regardless of their size or their geological and cultural histories.

A Race to Establish a National Cave Inventory

Those who lived, in 1967, the transition from Speleology Section to Venezuelan Speleological Society recalled the extraordinary effervescence, the sense of possibility, the excitement to start anew. As noted in Chapter 2, this Society created a different kind

of space for science in Venezuela, one that involved a different relation to nature and its history. But this was not without its perils. On the one hand, the Society in many ways challenged the elitism and institutionality of traditional scientific pursuits and agendas in the country thus far. On the other, it set itself up for a difficult start. Leaving the patronage of the Venezuelan Society of Natural Sciences meant leaving behind an institution that granted national and international recognition. It meant having no physical home or publication. Moreover, precisely because the group hoped to carve an alternate and independent space by engaging in a science that was itself already at the margins, it struggled to gain a footing. Yet, from accounts of those who lived this transition, it seemed that the challenges only fueled the ambition to succeed.

These challenges had to be addressed quickly. The Society's ambition of a country-wide speleological project was not theirs alone. The once long-time director of the Speleology Section Eugenio de Bellard also harbored these aspirations. There was a race to take the lead and thus gain the upper hand as producers and arbitrators of Venezuela's speleological knowledge. At stake too was the capacity of Venezuelan speleology's participation in the growing universe of international cave science.

Among the most important challenges that the new Society faced was creating its own publication. The creation and continued production of the *Boletín de la Sociedad Venezolana de Espeleología* was from the start central to the Society's definition as a volunteer-based, collective, scientific, national endeavor. It became both currency and space to imagine and project a broader regional speleology. Its pages have featured the group's own cave science, along with research from other Latin American speleologists. Most important, the journal has been the home of the national speleological cadastre, or

cave registry, which includes maps and descriptions of most of the caves explored and surveyed in the country thus far. Most, but not all. As arbitrator of this registry, the SVE has established rules of inclusion and exclusion not recognized by everyone. A closer examination of some of the debates regarding the definition of this cadastre reveals how the exploration and knowledge of the cave landscape are intertwined with moral and ethical judgments about who and how proper speleological knowledge ought to be produced.

Prior to the 1950s, any attempts at characterizing the caves of Venezuela focused primarily on Guácharo Cave, particularly since Humboldt's 1799 visit (Urbani 1995, 2000). In 1931, Italian naturalist Pietro Gerardo Jansen published an article titled "Grotte e caverne del Venezuela" (Grottos and Caverns of Venezuela) in an Italian magazine (Urbani 1969:49-53). Two thirds of Jansen's piece is dedicated to Guácharo Cave. He ends with a tantalizing invitation:

But how many caves might Venezuela possess, with its imposing mountain ranges, caves and grottoes barely noted by some *indígena* or some lonely rancher, always frightened to enter and explore the sinister and ghostly hidden underworld? Venezuela, which is on its way to a secure economic future thanks to its government policies, which have valorized its abundant oil deposits, which its soil contains, along with its increasingly valued iron deposits, which are so important in this mechanical era, when the mayor problems of the industry are solved, it would be of great benefit to achieve greater access as well to its natural beauties... [Urbani 1969:53]

The founding in 1952 of the Speleology Section heeded Jansen's call. Already in 1953, Eugenio de Bellard traveled to Paris as the Venezuelan Society of Natural Sciences' Official Delegate to the First International Congress of Speleology. In a presentation he summarized the history of Venezuelan speleology, as well as the exploratory achievements, up to date, of the group (de Bellard 1956). He reported that the

Section had, to date, explored "117 of the 449 located caverns, in other words, a fourth of the hypogean [underground] formations noted in the index" (de Bellard 1956:29). What did this early index look like? De Bellard's contemporary Carlos Tinoco recalled that this

index ("fichero") existed and was in Eugenio de Bellard's power... we added to it the notes that we gathered [in the field], notes of [us] explorers and also hunting friends, news clippings, etc. We used [this repository] to plan outings and our results were added to it, with the drafts of maps, notes on access routes, etc. . . . When de Bellard was assigned to work in Zulia state, I kept the famous archive in the basement of the bank where I worked. When he returned, angry at us, I was surprised with the almost violent tone with which he requested the return of the catalogue, since it belonged to the Speleology Section.³ I turned it over to him immediately, and I did not hear anything again on the subject. I am not sure how useful this material . . . might have been to Eugenio for his later publications. [Tinoco, Personal Communication, May 26, 2010]

In April of 1954, the Speleology Section made a first attempt at publishing a census of Venezuelan caves. The archive continued to grow, particularly after 1965, when Juan Tronchoni directed the Section. Growing differences in leadership styles and visions between Tronchoni and de Bellard culminated in the suspension of the Speleology Section and the creation, in 1967, of the Venezuelan Speleological Society (SVE), which all of the active members of the Section joined.⁴ Two years later, de Bellard, committed to his speleological ambitions, completed his *Atlas Espeleológico de Venezuela* (Speleological Atlas of Venezuela) as a supplement of the *Boletín de la Academia de Ciencias Físicas, Matemáticas y Naturales* (Bulletin of the Academy of Physical, Mathematical, and Natural Sciences). This publication contains a listing of 989 caves, organized by state, "of which 172 have been personally explored" (de Bellard

³ De Bellard's anger stemmed from an accumulation of events that in his view had corrupted the Speleology Section and had effectively shunned his role as pioneer of Venezuelan speleology. See Chapter 2 for details on these events.

⁴ As noted in Chapter 2, de Bellard was not an active member at the time, although he remained part of the Board of Directors of the mother institution, the SVCN.

1969:8). There are no maps. As Tinoco told me, it is probable that de Bellard did not find much use in the maps of the alleged early archive to produce this *Atlas*.

By then the Venezuelan Speleological Society, just two years after its founding, had published two volumes of its independent *Boletín de la Sociedad Venezolana de Espeleología* (Bulletin of the Venezuelan Speleological Society). This publication included cave maps of a quality unmatched by anything produced by the Speleology Section under de Bellard's leadership. He must have realized this. Furthermore, acquaintances close to de Bellard have suggested that he lacked the skills to produce his own maps. Instead, he counted on the support of Ramón Hernández, who allied with him shortly after the break-up of the group in 1966, and eventually joined the new Grupo Espeleológico (Speleological Group) that de Bellard created shortly after the breakup of the Speleology Section, also under the institutional umbrella of the Venezuelan Society of Natural Sciences. Hernández was a skillful explorer and surveyor, the “Power Horse” of the group, in the words of one of his contemporaries. Together they formed, in the words of Hernández, “a symbiosis: He collaborated with me with expenses, with transportation, and I collaborated with him with photographs, with written reports, with the actual exploration” (Hernández, Interview, 2007).

A very strong friendship and mutual respect bound these two men of drastically different classes. Yet, a sense of disappointment was palpable in Hernández's voice when he described the many cave maps he produced throughout his lifetime (many of them with his brother and not de Bellard). “What happened to all of those maps?” I asked him. Hernández: “A few were published in the *Boletín de la Sociedad Venezolana de Ciencias*

Naturales (Bulletin of the Venezuelan Society of Natural Sciences) but many were not. De Bellard kept them in his files” (Hernández, Interview, 2007).

In the introduction to his *Atlas Espeleológico de Venezuela*, published in 1969, de Bellard credits the members of the Speleological Group and the Hernández brothers in particular, for their contribution (de Bellard 1969). In its introduction, he states that the publication be taken as "modest base and starting point" to a greater speleological project, one that in the future ought to include maps (de Bellard 1969:22). As it stood, his contribution included

989 caves, 30 of which include guácharos ... 38 caves contained archaeological remains, 5 caverns featured rock paintings and 3 with petroglyphs in its exteriors. 49 caves contained underground streams or rivers, while 99 grottos featured vertical development, in other words, turned out to be pits or cave/pits. We conclude by stating that 40 caves have disappeared victims of mining and progress. [de Bellard 1969:9]

Despite the use of plural pronouns in the text, this *Atlas* is an individually authored work. It was with this publication that de Bellard was granted entry as member ("miembro de número") of the Venezuela's Academy of Physical, Mathematical, and Natural Sciences.

Even with de Bellard's swift publication of his *Atlas Espeleológico de Venezuela* in 1969, the Society hardly felt out-competed. Several past and present Society members impressed upon me how the *Atlas* hardly counted as proper speleological knowledge:

“Have you seen it? It is just a list of caves. It doesn't even have maps!” one retorted.

Another, noting that de Bellard was admitted to the Academy of Physical, Mathematical, and Natural Sciences on the merit of this work, gasped, “Do you think there is a right to this?! No!” His reaction signaled both his view that de Bellard's work lacked rigor and that a national scientific academy could accept members on questionable merits.

Despite these presumed questionable merits, de Bellard benefited from being the sole author of this work. He did not have to depend on others in the process of organizing the list of caves, or putting together the draft of the document, or sending it off to the publishing house. This was not the case of the SVE. To understand the Society's efforts to define and produce the national speleological registry, we need to consider the struggles they faced to produce the *Boletín*. These struggles were (and remain) intimately tied to the group's structure (and ideal) as a collaborative project based on the volunteered hard work of its members.

Antecedents and Origins of the *Boletín de la Sociedad Venezolana de Espeleología*

I was in Venezuela during the months leading up to the publication of the *Boletín de la Sociedad Venezolana de Espeleología's* 40th anniversary volume. In the SVE's meetings on Wednesday nights, Francisco Herrera, the publication's editor at the time, repeatedly voiced concerns about the process. "Rafa, when will you finish touching up the pictures? Joaquím, we need to get together to finish the final draft of the cave maps..." What began with a list of things pending turned into a litany of grievances, expressed with an increasingly worried tone. Those of us sitting around the table were quiet as we endured a lecture on individual responsibility and commitment to the Society's creed on team effort. "This can't go on like this," Herrera stressed. "The Society is supposed to be a collaborative project. It is up to all of us to keep it alive. If we do not finalize this volume quickly, we will lose our funding, putting the publication in peril."⁵

⁵ Prior to 1993, the publication of the *Boletín* depended on donations from both public and private (mostly private) Venezuelan institutions. Tronchoni was for many years the Society member tirelessly dedicated to securing these funds. The Society's

And a publication in danger translated into a Society in danger, the life of the *Boletín* the material instantiation and pulse of the organization's being, at least to some.⁶ Yet, this concern has not been new to the group. In fact, it seems to have characterized its history and been, even, a condition for its existence. In a 1980 letter to a fellow member, SVE caver Carlos Galán expresses deep concern about the "paralysis" afflicting the SVE's publication: "If we do not publish it is a bit as if we did not exist." When Francisco Herrera joined the Society in 1986, the publication was going through yet another paralysis. "The bulletin had not been out for three years," he recalled. He immediately got involved, recognizing the importance of the journal's continuity, finally getting a volume to press, which even in normal circumstances is an extraordinary accomplishment for an organization so small and so limited in resources. In effect, it usually has been a handful of individuals who have made sure the publication's run does not end, dedicating

correspondence archive is full of his letters asking for support. Having enough money to maintain the publication was a constant preoccupation for the group. This changed (somewhat) in 1993. That year, SVE member Carlos Bosque became the *Boletín*'s editor. During the time, Bosque worked in the Commission of Biology and Agriculture of the National Council of Scientific and Technological Investigations (CONICIT). This governmental organization was founded in 1967 to promote the study and application of science and technology towards the modernization of the Venezuelan state (Texera Arnal 1983). Through this experience, Bosque learned about the possibility that the CONICIT might be able to fund the SVE's *Boletín*. To qualify, it had to meet certain criteria (for example, regularity of publication, quality of articles, etc.). Bosque led the successful effort to meet these criteria and gain CONICIT support. But as Herrera has stressed, and the discussions in many SVE meetings attest, this new source of funding is anything but stress-free. The stakes are now higher to ensure that the group not lose the CONICIT funding.

⁶ SVE member Joris Lagarde, who was member of the Society during the 1980s and 1990s, believes that the Society puts too much effort on its publication. Lagarde, who did not have an academic career, argued that some members used (or at least benefitted from) the *Boletín* as a platform to publish their own work, and thus help, even if tangentially, their own academic careers (Lagarde, Interview, January 4, 2008). This, he suggested, explains these same members' emphasis on its production and quality. Yet, Lagarde also contributed actively in the publication's production and quality, such as cave photography and graphic design.

countless hours to securing monetary and material donations, writing, editing, typesetting, drafting maps, touching up photographs, and preparing mailings.

With its 42nd volume fresh off the publishing house (as of mid 2010), and the planning of the 43rd well on its way, the group has exceeded by far expectations both from without and even within. Having its own publication always had been one of the goals of the group since its beginnings as the Speleology Section of the Venezuelan Society of Natural Sciences. Between then and 1958, the Section relied on the publication of its mother institution, the *Boletín de la Sociedad Venezolana de Ciencias Naturales* to publish reports on its activities. By 1958, the group produced its first independent journal, but could not continue its run due to lack of funding (Tronchoni 1965). In 1965, it finally produced its *Boletín Espeleológico*. By then Juan Antonio Tronchoni was director of the Section. In the introduction to the volume he notes:

During many years, it was the constant wish of the members of the Speleology Section of the Venezuelan Society of Natural Sciences to count on a publication that fulfilled the double function of allowing the fruits of our modest labor to be known both nationally and internationally, and of serving as a unifying force among the many speleological associations of the world. [Tronchoni 1965:1-2]

More critically, having its own publication granted the group greater independence to define its content and distribution. According to fellow SE-SVCN member Carlos Tinoco, this was an uphill battle, further sowing the seeds of internal discord that contributed to the group's divorce from the Venezuelan Society of Natural Sciences and the creation of the independent Venezuelan Speleological Society:

the SVCN limited us on what we could publish there [in its Bulletin], unless Eugenio [de Bellard] authorized it and that it be within the budget of the Society [SVCN]. This limited us greatly. Carlos Bordón and others always thought necessary our own bulletin for national and international dissemination. Speleology had very few friends in the [SVCN's] Directive.

It favored botanical programs over our interests and work. [Tinoco, Personal Communication, May 26, 2010]

Growing personal rivalries between Eugenio de Bellard, who also sat on the Board of Directors of the Venezuelan Society of National Sciences, and Juan Antonio Tronchoni, were inextricably linked to the internal institutional tensions that Tinoco alluded to.⁷ To Tronchoni, the group's publication ought to feature works by any of its members, regardless of their seniority within the organization, as long as they achieve a high scientific and professional standard. The second volume of the *Boletín Espeleológico*, published in 1966, features works by the newly admitted young members whose entry de Bellard was so concerned about. For example, Pérez, at the time 16 years old, authored an article on fungal infections in Venezuelan caves (Pérez 1966). The next article featured general geological principles (Alvarado Jahn 1966). Its author was long-time and senior SE-SVCN member Raul Alvarado Jahn. A note describes recently admitted high school student, Franco Urbani, as in charge of the Section's library. The pages of the *Boletín Espeleológico*, then, furthered Tronchoni's vision of speleology as a civic and nonhierarchical science that promoted youth's involvement, especially if new members brought new skills capable of furthering speleological pursuits. To de Bellard, these new members threatened the traditional order of institutional science, and therefore, his standing as founder and main promoter of speleology in Venezuela.

The same year that the Venezuelan Speleological Society was founded, its first volume of the *Boletín de la Sociedad Venezolana de Espeleología* was published. The group also relocated its equipment and collections to a rented building in Caracas. Carlos Bordón, who had been with the group since shortly after his arrival to Venezuela in 1957,

⁷ See Chapter 2.

was intimately involved with the production of the *Boletín's* first two volumes. In this, his experiences in his hometown of Trieste, Italy, were invaluable. In June 2007, I interviewed Bordón in his home in the city of Maracay, two hours west of Caracas. He had turned the basement into a personal abode, packed with books, drafting tables, expedition equipment, and mementos of over 60 years of exploration and field science both in Venezuela and all over South America, which he traveled twice with his wife Nora to collect insects. By the mid 1980s, Bordón had one of the most complete insect collections in the continent. One of the rooms in his basement contains a small sampler of the extraordinary variety of specimens that he collected, conserved, and classified (Fig. 3.1).⁸

I was born in Trieste, where speleology was also born... I was 13 or 14 years old when I made my first contact with caves. I had a friend who went frequently on cave excursions. One day he decided to explore a cave near Trieste, called Vilenica... When we arrived it was closed with a metallic door because it belonged to the municipality, which had closed it off to protect it [from vandalism] during parties. We climbed up, because it [the cave] was at the bottom of a sinkhole. We climbed up along one side, about 10 to 15 meters. There was an opening that gave us access to the cavern... [My friend] had a rope with him. He threw the rope down in there, tied it to a rock, and told me, "Look, you put on the rope like this, like this, and like this," and he threw himself in, leaving me there all alone in the darkness with that rope [laughter]. If I did not kill myself at that

⁸ Bordón's amateur dedication to entomology was unique within the Society. However, members routinely collected geological and biological specimens to analyze. Archaeological artifacts sometimes were collected as well. They published the results in the bulletin. The original idea of the SVE founders was to create a speleological museum that included field materials. This never came into fruition. Instead, the group quickly amassed a great amount of materials that they struggled to maintain in an orderly fashion in the several buildings they rented throughout the years. Once they settled, in the 1980s, in their current space (the basement of a residential building in Bello Monte, a Caracas neighborhood) this collection had become much smaller, with many items damaged, donated, or kept at the homes of members. In most cases, the individuals leading this collection, analysis, and publication of results sought (or already had) academic careers in geology, zoology, ecology, and archaeology. Thus, their individual careers often benefitted from these speleological activities.

moment that meant that I had a guardian angel who was taking care of me and kept taking care of me for 80 years. And so I went down...

It was pretty much obligatory in Trieste to go to caves, because there are so many. I think that the current cadastre has about 5,000 caves in a territory as large as the [Venezuelan] state of Aragua. That's how I started off with caves. After, I grew fond of insects... There in the caves of Trieste bioespeleology was born... [In] Postumia cave... the first blind bug was found. Completely blind, an insect, the *Leptodirus hochenwartii*, the first blind insect discovered. No one imagined that blind insects existed. Now there are 10 or 20 thousand species known, but that was the first...

When I was about 15 or 16 years old, with another friend we set up a speleology society, with its statutes, its rules, its membership card, its emblem, and with the seal sewn on the t-shirts (that was the job of our mothers). And of course, like all small groups of that time we did not respect the official cadastre, we had to have our own cadastre, assigning our own numbers to the caves, so that now in retrospect it is not possible to know which caves we visited because they did not correspond to our cadastral numbers. [The name of the group was] STS, Sociedad de Espeleología Triestina [Speleology Society of Trieste]. This group was active for 10 years, from 1938 to 1948.

When I arrived to Venezuela, after the first week of settling in, the first thing I did was find out if there were any speleologists to make contact. I found the Venezuelan Society of Natural Sciences, which had a speleology section. There I met Juan Antonio [Tronchoni], so he was the oldest friend I had in Venezuela... So I joined "the gang..." Eduardo [Schlageter], Eugenio De Bellard, Raul Alvarado Jahn, Ramón Hernández, Carlos Tinoco, Marcos Sandoval... [Bordón, Interview, June 19, 2007]

Recounting the tensions that eventually led to the end of that group and the creation of the SVE, Bordón explained that he was against this change. He stressed that the group needed a physical space to store its collected specimens and all of its equipment (otherwise, he joked, "the women would complain of all of that dirty equipment full of ticks in their homes!"). More importantly,

[the SVCN] already had a bulletin. It was easier to ask for two or three pages [of that publication] than to start a new one...⁹ When we created the

⁹ This statement appears to contradict Tinoco's statement earlier in the chapter that Bordón supported the idea of an independent publication. It is probable that Tinoco

new Society [SVE], the main problem was the bulletin... I would tell them that it is not that simple. It is not insurmountable either, but it requires a different kind of commitment ... I made the first volumes, I mean *physically* made them! [Bordón, Interview, June 19, 2007]

In a later exchange, Bordón emphasized that

everybody talked about the bulletin, but nobody wanted to get it going, it was something mysterious. Then, I convinced Juan Antonio [Tronchoni]. He had friends at the printing office of [the national newspaper] *El Nacional*, which lent us a flat-bed printing press, with movable type, that they used only sporadically for publicity posters. Also, a friend of Juan Antonio had a screen printer so he took care of the prints of pictures and maps. I had some experience [with the printing process] because in the years 1944 and 1945, in Trieste, I had organized an underground printing project in the fight against the Nazis, and we had to invent it all. [Bordón, Personal Communication, June 1, 2010]

In that first June 2007 interview, Bordón further recalled the publication of those first numbers of the *Boletín de la Sociedad Venezolana de Espeleología*:

No one knows who edited the bulletin. It was more important to show that it could be done. Otherwise how could we have done it? We would have had to hire a printing house to do it all. At least for the first 10 or 15 volumes I drew all of the final maps in the cadastre in order to show them how it had to be done... I do not want to show false pretense. The point is that by me putting together those first bulletins, everyone could see that it could be done. [Bordón, Interview, June 19, 2007]

Bordón's speleological experiences in Italy helped define the Society's scientific and professional identity. His self-taught expertise in cave biology helped establish the Society's interest in the field from early on, with Bordón promoting proper specimen collection during expeditions. Moreover, the group's first serious efforts at beginning the

referred to the later period when it was evident that depending on the SVCN to publish anything was virtually impossible.

national speleological cadastre owe it to his drafting skills. Finally, and most critically, he had the capacity to get the job done.¹⁰

Urbani recalled that Bordón had European publications that the group used as examples to follow. The Touring Club Italiano's 1926 publication *Duemila Grotte* contained cadastral elements that they aimed to emulate (Bertarelli 1926). Moreover, by the mid 1960s the Speleology Section was on the mailing list of a number of caving magazines from what Tronchoni referred to as "the world's main scientific centers," such as the American National Speleological Society's *NSS News*, *Rassegna Speleologica Italiana* (Italy), *Stalactite* (Switzerland), *Spelunca* (France), *Speleo Digest* (USA), and *Comissione Grotte Eugenio Boegan* (Trieste). To publish and circulate a Venezuelan speleological bulletin was, then, a critical step towards the group's desire, in Tronchoni's words, "to integrate itself into the present strong international current, and extract from it the greatest amount of knowledge possible" (Tronchoni 1958:2).

The First Volume

In the introduction to the first volume of the *Boletín de la Sociedad Venezolana de Espeleología*, Tronchoni thanks Dr. Raúl Valera, governor at the time of the Federal District (with Caracas as capital) for financing its production. Five hundred exemplars made it off the Central University of Venezuela Press in time to commemorate 400 years

¹⁰ Of course, he represented more. As a European immigrant to Venezuela, he shared an affinity with several other Speleology Section members, in particular Tronchoni, whose own family suffered the consequences of war in Europe. As a native of *the* original karst region of the world, Bordón linked the Section, by a degree of one, with the "birthplace of speleology." In his appreciation, these qualities granted him de Bellard's acceptance and thus entry into the Speleology Section, despite the fact that he [Bordón] was not part of the high class of Caracas.

since the founding of Caracas in 1967. This first publication established a look and feel that would hardly change for the 19 volumes that followed: with its 16 by 26 cm format, its cover featuring the Society's recently designed logo: a bat and an electron ladder inside of a double circle with a blue backdrop, the only color in the entire publication, the words "lux in tenebris" (light in the shadow) crowning the symbol. Its content has six parts: articles pertaining to "Physical Speleology," the description and maps of caves in the "Cadastre," articles on "Speleological Archaeology," followed by those on "Biospeleology," and finally, shorter sections on "Speleological News" and "Bibliographic Notes." The contributors varied from original Speleology Section members to recent newcomers, some barely out of high school.

Recent member Franco Urbani featured two articles, one on the geology of cave pit Sima del Agua Dulce, located in the town of Chichiriviche, Falcón State (Urbani 1967a), and the other a brief review of the term "speleothen," coined in 1952, to describe secondary cave formations (such as stalactites and stalagmites) (Urbani 1967b). These would be the first of numerous publications on cave geology and mineralogy that Urbani would publish in the *Boletín* and other academic journals (he eventually received a Ph.D. in geology from the University of Kentucky in the 1970s). This first volume also includes a brief description of "Cueva La Peonía," a cavern located in the region of Barbacoas, in Lara State (Rod 1967). Its original author was Emile Rod, a geologist of the Venezuelan Atlantic Refining Company who carried out geological studies of the region in 1950. The article includes the cave's description, along with graphics of the tectonics of the area, a plan (from the top) view of the cave, and another profile (from the side) view that locates its development within the geological formations of the area. This work had first

appeared in English in the *Boletín Informativo de la Asociación Venezolana de Geología, Minería y Petróleo* (Rod 1960). Urbani translated the note, explaining its potential value for future speleological exploration and research, as well as noting that this work makes Rod “pioneer in scientific speleology of the country” (Rod 1967:11). This entry also is first of many Urbani would publish on the history of cave exploration and speleology in Venezuela.

The “Physical Speleology” Section also features an article titled “Indispensable Requirements to Establish an Underground Microclimatic Station” by SVE members Raúl Alvarado Jahn and Julio Lescarboursa (both part of the “old guard,” members who had been active with the Speleology Section of the Venezuela Society of Natural Sciences and of Tronchoni’s generation) (Jahn and Lescarboursa 1967). The piece includes detailed descriptions of how to obtain measurements of temperature, pressure, relative humidity, and wind speeds, as well as two photographs of the authors (although their names are not specified in the legend) using the measuring instruments inside La Azulita Cave in Mérida State.

An analysis of archaeological remains from Lizardo Cave, also in Falcón State, is featured in the *Boletín*’s section on “Speleological Archaeology.” Oscar Garbisu and Miguel Angel Perera, both anthropology students in the Central University of Venezuela, authored the piece (Garbisu and Perera 1967). The article includes detailed descriptions of 72 pottery remains, along with diagrams of the cave floor’s stratigraphic analysis and the most peculiar painted patterns on the pieces of pottery.

Finally, Omar Linares, also a high school student and member of the La Salle Society of Natural Sciences, authored an article of the description and distribution of the

bat species *Lonchophylla robusta*, previously unknown to exist in Venezuela (Linares 1967). Linares went on to study biology at the Central University of Venezuela. A focus on Venezuelan mammals, and bats in particular, would become Linares's career specialization.

The *Boletín's* "News" section briefly summarizes the group's recent explorations, including those outside of the country, as in the case of SVE member Hellmuth Straka to Africa. It also notes the negative findings of an expedition to the Venezuelan region of Peñón de las Guacas, where its members did not find any caverns. Finally, this first volume's 64 pages closes with a brief summary of recently published speleological literature from Cuba, France, the United States, and Brazil.

Beyond its explicit functions of publication and dissemination of speleological knowledge, the *Boletín* served as a presentation and promotional piece to garner recognition of and financial support for the group's activities. To Tronchoni, who, as SVE president for a total of 20 years, the production of the *Boletín* was an enormous source of pride. SVE member Fernando Enrech emphasized the importance that the publication had for Tronchoni: "Juan Antonio was very proud [of the *Boletín*]. He, who had no high school diploma, felt a sense of fulfillment" (Enrech, Interview, January 4, 2008). In the numerous letters that Tronchoni wrote to potential public and private donors to the Society, he states including a copy of the most recent volume as material instantiation of the group's serious commitment to national speleology.

This brief exploration of the *Boletín's* history and content, at least in its early years helps bring into sharper relief the activities of the Society and the breadth of its speleological ambitions. More specifically, it sheds light on the ways caves became not

just objects of science but places *for* science. As nature's natural laboratories, their hidden archaeological remains were to be excavated, samples of their unique organisms collected and catalogued, its unique minerals studied, its geomorphology and hydrology understood and traced as part of a broader cave landscape. A cave's map would be foundation of these scientific possibilities. Thus, it was critical that these maps be well done for the subsequent science "to count." Defining the standards of cave map-making became yet another challenge during the SVE's first years. As these challenges were met, so were caves and cavers dialectically defined.

Defining Cadastral Standards, Defining Society

The cadastral elements of the Touring Club Italiano's 1926 publication *Duemila Grotte* became the standard that the Society aimed to reach and emulate (Bertarelli 1926). Caves were to be surveyed systematically, their final maps containing both plan (top-down) and profile (side views). Each cave entry also would include a description of the cavern, emphasizing its geological, hydrological, and ecological characteristics. This was to be done with *every* cave, no matter how monumental in terms of size, anything it contained, or who had visited it in the past. This amounted to a shift in how the caves of the Venezuelan subsoil were made "visible."

During the first years of the newly established group, there was a strong impetus in gaining international credibility. Making sure that foreign speleologists and cavers recognized the Society's scientific standards was key in this regard. Yet, these international standards were themselves in flux during 1960s and 1970s, with several SVE members becoming actively engaged in discussions that led to their eventual

definition.¹¹ Debates regarding the proper production and management of speleological knowledge were not the SVE's sole preoccupation within Venezuela. By the mid 1970s, there were other caving groups eager to have a say in the definition and maintenance of the national caves registry. Not only did Eugenio de Bellard create a new speleological group within the Venezuelan Society of Natural Sciences, there were other organizations springing up.

In 1975, the Centro de Exploraciones Espeleológicas or CEE (Center of Speleological Explorations) of the Universidad Simón Bolívar (Simón Bolívar University) organized the first meeting of speleological groups in the country, each represented by two members. De Bellard and Hernández were present, along with two SVE members (Franco Urbani and Miguel Angel Perera), two CEE members, and others from a group called Inter and another called Grupo Venezolano de Exploraciones Espeleológicas (Venezuelan Group of Speleological Explorations). By the end of the day-long meeting, all of those present, except de Bellard and Hernández, agreed to continue using the SVE's cave nomenclature it had been using thus far (state initials followed by the number of the entry in that state). They also agreed to the renamed Speleological Cadastre of Venezuela published in the SVE's *Boletín*. This was not acceptable to de Bellard and Hernández. They would continue cataloguing the caves they explored and surveyed using their own naming and indexing conventions that de Bellard established in his *Atlas*. Acknowledging the previous contentious history between de Bellard and the now well-established and growing Venezuelan Speleological Society, it is likely that in

¹¹ Franco Urbani exchanged several letters with French speleologist Claude Chabert on these topics, complete with hand-drawn graphics that illustrate their points. Chabert went on to become an important international expert on cave surveying and mapping (Chabert and Watson 1981).

part he rejected the idea of having the caves explored by his new group published in the pages of the rival organization. It may not have mattered how open and collaborative the SVE emphasized the cadastre to be. It may not have mattered that each cave entry lists the group and individuals involved in its survey. To see one's cave maps published by the SVE is at minimum to tacitly acknowledge and contribute to the SVE's success as arbitrators of the nation's speleological knowledge. I will return to this point further on.

Also during this meeting, the groups agreed on a new cadastral entry and survey standard by which cave submissions would be judged (SVE 1975:105-108). These standards also would impact how surveyors would work in the field, acknowledging that certain practices would be necessary to ensure the final quality of the cave map. Each cave entry would include the name of the karst region where it is located, its geographical coordinates, the net vertical displacement of the cavern (the difference between the highest and lowest points), and the quality of the survey.

The survey quality criteria were adopted from the British Cave Research Association (BCRA).¹² These criteria require that each survey be graded with two values. The first is a number from 1 to 6 corresponding to the degree of accuracy of a cave's line plot. The line plot is a scaled two-dimensional image representing the length, horizontal orientation, and vertical displacement of cave passages (Fig. 3.2).¹³ Based on these standards, a sketch done with no measurement tools would be assigned a "1" and a plot done with both compass and clinometer with minimal range of error a "6." The second BCRA value is a letter designating the degree of detail, such as form and size of galleries,

¹² This is the very organization that had gone through major transformations, starting in the 1930s, as it faced the challenge of pooling and coordinating cave surveys done by groups of different regions (Cant 2006:785).

¹³ Chapter 4 describes the production of a cave survey in detail.

whether or not they contain different formations, etc. An “A” would correspond to detail drawn by memory, while a “D” suggests a high degree of detail, its precise location carefully marked in the survey constructed *while in the cave*. Both the line plot and detail criteria are related, since the degree of detail within the cave depends on the quality of the line plot.

The caving groups present at the 1975 meeting finally agreed that the Speleological Cadastre of Venezuela would only list caves with a minimum BCRA degree of 3B, with a “3” requiring that

the line plot be done with a compass, with the horizontal and vertical angles are measured [with an error] of ± 2.5 degrees, with distances measured within ± 50 cm, and survey station positions have an error within ± 50 cm. [SVE 1975:107]

Further, the “B” value suggests that at minimum, “all details of the galleries are estimated, but noted inside of the cave” (SVE 1975:107). There was an additional criteria that the groups agreed on, and that was the line plot precision (*relación de precisión*), which requires that the plot “link and close up” when galleries within the cave actually interconnect.

These new cave mapping standards had implications not just on whether or not, where, and how their maps were published, but also on dynamics in the field. They required that cave explorers work in teams with the necessary skills and tools to produce an accurate line plot. As will become clear in my description of these dynamics in the coming chapter, then, these cave mapping standards affected not just the ways caves were represented, but also how they were *experienced*. They also had implications on the ways cave groups organized and trained new members.

Newcomers to caving usually gained cave surveying skills by joining more expert cavers along in expeditions, but the need for more formal instruction often came up. To address this, the SVE attempted at times to organize speleology courses that included survey and cartography. Juan Antonio Tronchoni strongly encouraged this. He cautioned against increasingly closed cliques within the SVE. This point, which echoes Asó's concern, illustrates a tension in the role of friendships in scientific pursuits. While friends working together might be able to trust one another and count on each other's commitment and dedication to their common pursuit, their very friendships might discourage the entry and acceptance of new members. And for a group so small that depends on volunteer work, having no new members might spell its death.

Tronchoni was constantly prodding the more expert members to bring in new members, particularly young ones from universities, and to teach them the skills they possessed (Galán and Perera 2006). But doing so translated into a greater demand on the time of already busy individuals who doing speleology in their limited free time beyond their more formal careers. This is a contentious topic that has never left the SVE, one that Tronchoni never satisfactorily saw resolved in his lifetime.¹⁴

¹⁴ The way Maribel Ramos joined the group in the mid 2000s illustrates the complexity of this issue (Ramos, Interview, April 15, 2008). She described how long-time SVE member Francisco Herrera encouraged her to become a member. She had been working with him on a project at the Ecology Department of the Venezuelan Institute of Scientific Investigations (IVIC). When she applied for the position at the IVIC, Herrera took note of her interest in speleology that she listed in her curriculum vitae. As a student she had been a member of the Central University of Venezuela's speleology and outdoors club, Universidad Central de Venezuela's Centro de Exploraciones e Investigaciones de Campo (UCV-CEIC). In her view, Herrera probably vetted her as a valuable new member for the SVE and thus encouraged her. She explained to me that something similar may have happened to Luz Rodríguez, also a recent SVE member. In her case, Franco Urbani did the vetting and encouraging. He came to know Rodríguez from his position as a senior geologist at Fundación Venezolana de Investigaciones Sismológicas (Venezuelan

Despite stressing the collaborative quality of the Speleological Cadastre of Venezuela, in practice the SVE emerged as the arbitrator of speleological knowledge. In part, this was understandable, since the group counted with members with over 2 decades of experience exploring and surveying caves. Also, the group benefited from membership continuity that other newer organizations could not count on. This was especially true for university groups, whose members come and go as they start their programs and then graduate. But as arbitrator the SVE gained a reputation among some up and coming caving groups as too demanding, as critically destructive, and even as wanting to monopolize the cadastre.

To former SVE member Pedro Aso, these critiques were not totally unfounded. To him, they were evidence that the “organization had begun to eat up the movement” (Aso, Interview, August 21, 2007). Aso joined the SVE in 1967, just when he had finished high school. Describing it as an “unforgettable experience,” Aso recounted his first caving outings with his friends Carlos Todd and Freddy Vera in the east of Caracas. He joined the Society on several weekend trips to Guácharo Cave. He never met de Bellard, but lamented the split of the Speleology Section group. “I don’t believe in divisions, but I do support the growth of more groups.” He eventually pursued a

Foundation of Seismological Research, or FUNVISIS). To Maribel, it seemed as if new members to the SVE mostly relied on *apadrinaje* (“godfathered” relations) to enter. Otherwise, the group appears to the outsider as very closed. I commented this apparent phenomenon to my father, who answered: “That is really regrettable. That is precisely what Juan Antonio [Tronchoni] was against, since it goes against his ideal of an open Society” (Pérez, Personal Communication, 2011). And yet, from the perspective of Herrera and Urbani, two of the most dedicated and multifaceted members of the Society, whose years of commitment have sometimes—almost single-handedly—made sure that the *Boletín* makes it to press, their encouragement and support of Ramos and Rodríguez must be understood. Nor does this encouragement necessarily mean that others might not join in other ways (for example, reading the *Boletín* and independently contacting the Society).

scientific career and is now a professor of biology at Simón Bolívar University. Deeply committed to the promotion of science among youth by exposing them to fieldwork, he has at times mentored the student speleology group at his university (the CEE). He took on this role after he had stopped caving himself. Even as SVE member, however, he had difficulty fitting in, finding some of the tightly-knit cliques within the group almost impenetrable. Regardless, the Society's leadership under Juan Antonio Tronchoni promoted, although not without difficulties, openness, inclusiveness, recruitment.¹⁵ Aso:

Juan always stressed the need for social gatherings, such as Christmas parties, in order to increase the camaraderie among all members of the organization. He would get angry if people didn't come. Juan saw this and acted on this. He could befriend stones. [Aso, Interview, August 21, 2007]

Efforts to bring together different caving groups under the umbrella of the Speleological Cadastre of Venezuela appeared, at first, as a perfect opportunity to promote coordination and unity, both for the sake of speleological knowledge and its practitioners. By having SVE expert members mentor explorers and surveyors on map-making techniques could also address one of Tronchoni's biggest concerns: the need to interest and train young university students on speleological techniques. This also could work as a recruitment strategy. But as Aso noted, this vision was problematic since the Society "was competing with university groups for members. It might be fine if the Society recruits in universities with no speleology group, but not in a place like Simón Bolívar University [that had a caving group]" (Aso, Interview, September 4, 2007). Had the SVE become a coordinating body among regional caving groups in the country and

¹⁵ Many of these dynamics play out along the science versus sport divide that characterizes speleology. I return to this topic in Chapter 6.

not become involved in exploration and surveying itself, the geography of interests, of questions of authorship, and of identity might have been less jagged, less fractured.¹⁶

Just as some within the SVE shared Tronchoni's concern for openness and recruitment, others focused on the shared desire to see the SVE grow as a reputable *scientific* organization. This required, in their view, increasing the standards of the speleological knowledge produced and published in the group's journal. On this count, the criteria of inclusion and exclusion of maps within the cadastre became not just a scientific but also a moral jousting ground. And with the resources of time and effort by already over-committed SVE members stretched thin, adding the need to teach and critique the work of other cavers became overbearing to some. I brought this up with Rafael Carreño, an SVE member since the 1980s, and a skillful surveyor and mapper. In his view, the indictment of the SVE as an overly critical organization is not fair, stressing that SVE members like himself eagerly have helped many with their survey and mapping skills. Yet, he emphasized that they can only do this so many times before realizing that their efforts are being wasted and even openly disregarded. Patience starts to run thin.

We Came Together at the Map: The Cadastre as a Boundary Object

So far I have provided a sketch of some of the challenges that the SVE faced immediately after its founding in 1967. I have focused on the efforts to establish its publication, the *Boletín de la Sociedad Venezolana de Espeleología*. I have noted that this publication was critical on many counts. In particular, it was critical as the space where the SVE's national cave registry could be published. I also have suggested that we consider the

¹⁶ This is precisely what plagued the British Caving Association (founded in 1935) that Cant analyzes (2006). I describe this situation below.

creation of this cadastre in dialectic with the creation of the Society. This is true on two fronts: the internal one among the Society's very diverse members, but also the external one, as the Society defined itself among other speleological actors in the country, and eventually, the international speleological community.

Internally, I argue that the cadastre worked as a boundary object bringing people from diverse social worlds together in a common task. Leigh Star and Griesemer introduced the concept of "boundary object" in the late 1980s to help address a "central tension" in science: the fact that scientific work requires cooperation among differing viewpoints (1999[1989]:505). They illustrate the problems of this tension in their case study of a research natural history museum in California. As they note,

[t]he work at the museum, like that of scientific establishments everywhere, encompassed a range of different visions stemming from the intersection of social worlds. These included amateur naturalists, professional biologists, the general public, philanthropists, conservationists, university administrators, preparators and taxidermists, and even the animals which became specimens. [Leigh Star and Greisemer 1999[1989]:510]

The authors propose two strategies that help bridge these social worlds and coordinate the production of scientific knowledge: the creation of boundary objects and methods standardization. Here I focus on boundary objects.

Boundary objects are

those scientific objects which both inhabit several intersecting social worlds *and* satisfy the informational requirements of each. Boundary objects are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. They may be abstract or concrete. They have different social meanings in different social worlds but their structure is common enough to more than one world to make them recognizable means of translation. [Leigh Star and Greisemer 1999[1989]:509]

For example, a “species” is a boundary object that illustrates the power of an “ideal type,” an object that provides a general blueprint of a kind without getting into the specifics of any one instantiation of its type (Leigh Start and Greisemer 1999[1989]:518). Another example is the state of California (as a concept, as a physical space, and as a representation in maps). To the museum’s key patron, the goal of preserving what she saw as California’s distinct nature was very important. For the museum’s main scientist, focusing on the state of California helped delimit and focus his ecological vision (and practice) of natural history. The California *map* worked as a boundary object in its capacity to emphasize the activities of different actors: the roadmaps and campsites of species collectors, the “life zones” inhabited by distinct flora and fauna, and the ecological regions that the naturalists needed described and linked to the collected samples (Leigh Start and Greisemer 1999[1989]:518-519).

In the case of the speleologists, I argue that the cadastre worked as a boundary object in its capacity “to inhabit several intersecting social worlds” and satisfy the informational *and experiential* sensibilities of each. This capacity is premised on the fact that the registry was a registry of *cave maps*. As I will explain in detail in chapter 4, to map a cave entails its exploration. Moreover, cave mapping requires teamwork. Thus expeditions must count on participants who together share the commitment and have the skills necessary to get the work done. This commitment includes making sure members follow through with their intention of joining an expedition, not a trivial issue! These skills involve the physical and technical capacity to traverse the cave landscape. The preparation for the 2008 Alto de la Palencia expedition is a case in point. In a planning meeting, Francisco Herrera and Carlos Galán voiced their concern that everyone be in

good physical shape and that we pack only what was necessary in our bags. This was important since much mountain hiking was going to be necessary to *get* to the caves in the first place. The more experienced participants (Herrera, Galán, and Astort) made sure their climbing equipment was in order, since they would have to form the exploration and survey team of vertical caves that required technical rope work to get inside (rappelling in and ascending out). Most critically, Herrera and Galán made sure their survey equipment was complete and in order (their compass, inclinometer, and measuring tape, along with field notebooks and pencils). Although the rest of us were not as experienced, our participation meant there were more able bodies to help carry the equipment along the hike. Moreover, no one knew what kind of cave (or how many) we might find. If we encountered caverns with extensive walking passage, those of us without technical climbing abilities might focus on surveying those, while the more expert members focused their efforts elsewhere. Finally, our participation was part of a socialization process into the practices of the Society, as well as to the introduction of a cave landscape that had been the focus of the group for over 4 decades.

Regardless of expertise or scientific training, what brought all of us together was the desire to participate in the exploration to/of caves. The fact that this was not just a leisure pursuit, that its expressed aim was to find new caves, to map them, and to add them to the national speleological cadastre, guaranteed the participation and dedication of members such as Galán and Herrera. In turn, this aim increased our commitment to *explore* fully, or at least, as fully as possible. This meant both setting our pace so as to reach as many caves as possible and rigorously exploring the *insides* of caves so as to produce as “complete” a map as possible. In the case of the third cave surveyed during

the expedition, Ramos's commitment to squirm as far as possible down a black hole on the side of a pit appealed both to her desire to explore caverns *and* to gather as much information as possible that would eventually be used to produce their representation. It also consisted of a performance of sorts, a performance to her expedition team that waited along the rim of the pit and counted on her willingness and capacity to "push passages."

Even before traveling out east, we had talked among us about who would be responsible to produce the trip report. We agreed that Rodríguez, Ramos, Acosta, and I would work on it together. Thus, all of us took notes during the expedition. Acosta in particular appeared quite honored to take on this responsibility. As the one with the least formal education among us, he embraced the opportunity to do science. Most of all, he told me during an evening chat at camp, he loved being outdoors. The participation of each and every one of us contributed to the completeness and quality of the information that would eventually make the cadastre grow. And the commitment to make the cadastre grow ensured that all of us experienced the cave landscape, at least to the degree that our capacities allowed. In this sense, the cadastre worked as a boundary object in its capacity "to inhabit several intersecting social worlds" and satisfy the informational *and experiential* sensibilities of each.

I first began to think of the cadastre as a boundary object after my interview with SVE member Pedro Aso, whom I have already introduced. He offered his perspective on the sociology of the Society, noting three groups: the scientists, the non-scientific but career-oriented members, and the misfits. He stressed that even though it was mainly (but not exclusively) the scientists who were most committed to the regularity and quality of

the registry's publication, everyone in one way or other contributed to the enterprise. In his words, "We came together at the map." Precisely *how* members "came together at the map" requires attending to the practice of speleological science, both in the field and beyond. As will become clear in the coming chapters, this practice entails collaboration that brings together the scientific and sporting aspects of the pursuit. I propose thinking beyond the map itself to the cadastre in explaining how people with diverse interests came together. With the cadastre, the Society made a commitment to a nation-wide pursuit. To the non-scientist attracted first and foremost to exploration, this translated into the potential for participating in many expeditions to diverse regions of the country. The national scope of the project also ensured (and promoted) the authority of the Society as the country's leading speleological organization.

Moreover, the systematic knowledge of the cave landscape that the cadastre afforded often made visible potential new horizons (and depths) of exploration. For example, as more caves were located and explored in Zulia state, in the northwest part of the country, a fuller picture of the cave landscape was constructed. This "picture" suggested the potential size and location of the limestone outcrops. This information, together with state satellite images showing the disappearance of rivers from the surface, led to the location and exploration of what is now Venezuela's longest cavern, El Samán Cave (SVE 1996).

The Cadastre as Methods Control

The debates I have already addressed regarding the management and standards of the national registry also illustrate what Leigh Star and Greisemer describe as methods

control or standardization. Methods control involves the creation of protocols that help coordinate the activities of many actors by channeling them towards a common result (Leigh Star and Greisemer 1999[1989]:516). In Leigh Star and Greisemer's case, this common result involved the creation and maintenance of the research natural history museum. For example, the main scientist succeeded in drafting very specific rules on how to gather samples from the field. These instructions were fastidious but simple to follow, even for the amateur. By emphasizing the *how* over the *why*, these methods avoided galvanizing actors with diverse agendas (Leigh Star and Greisemer 1999[1989]:516).

We can think of the criteria defined in the 1975 meeting among speleological groups described above as an effort towards establishing methods control. There are some important differences between the natural history museum case and my own, however. While the agreement to adopt the British survey standards united several actors in a common pursuit (the pursuit of speleological practice that met some international, third party standard), the fact that the SVE would be the final *judge* of whether or not these standards were met galvanized some actors.¹⁷ This issue was compounded by the fact that the results would be published in the SVE's publication. While most players in that 1975 meeting agreed that the SVE's *Boletín* would be the best place to publish the new additions to the cadastre, to some (e.g., to de Bellard and Hernández described above) this arrangement felt like giving up the authorship and control of their speleological data to another party (and in this case, a party with a history of personal

¹⁷ I will not offer here a detailed discussion of how a third party might judge the accuracy of a cave map. Suffice it to say the SVE members would not go to a cave with the map in hand to "check" for inaccuracies. Instead, it would have to rely on

antagonisms). Moreover, it is clear that the discussion regarding speleological standardization did not separate the *how* from the *why* that Leigh Star and Greisemer point to as a key aspect of methods control as a tool towards collaboration (1999:516).

This is evident in the SVE's summary statement of the meeting:

The work that different authors have done so far on the matter was considered with great precision and detail, giving it its deserved value and merit, *always with the tone of depersonalizing this work, of not making it individual patrimony* but of judging it using an agreed upon standard of reason by all of the members present, an unwavering and basic standard of reason upon which to build on a work that grows in quantity and quality with greater accuracy and methodological validity. [SVE 1975:1, emphasis added]

In her analysis of the creation and eventual transformation of the British Caving Association (BCA), human geographer Sarah Cant notes that one of the points of tension revolved around the “records” (2006:783-784). This case has interesting similarities and contrasts to the ways the cadastre both united and divided Venezuelan speleological actors. The founders of the BCA in 1935 aimed to create an umbrella group to the many smaller regional caving clubs already active in Britain. As such, the BCA would raise the status of speleology at the national level. This goal involved creating a centralized archive of national speleological knowledge—its version of the Venezuelan cadastre.

Eli Simpson, one of the main proponents of the BSA, was appointed to manage the “records.” Simpson was not a career scientist. He was, however, an avid explorer, and also a strong personality. With this point Cant emphasizes the role of “personal geographies” in the shaping of British speleologies (2006:776). Simpson's view of speleology was evident in the ways he approached the records, which were a collection of notebooks with glued newspaper clippings, survey notes, maps, pictures, etc. These materials were not standardized or systematic in any way (or at least not in the way the

more scientifically-minded members hoped). Still, Simpson expected that BSA members (representatives of other caving groups) would contribute notes, surveys, and maps of caves explored in their region in order to build a more systematic central database of national scope. Few did. As Cant notes, Simpson's relation to the records was viewed as one of personal management and possession. To contribute information to the records was equated to giving up regional information that could be exploited not by an organization that represented all, but by an individual with personal speleological ambitions. In this sense, Simpson, and the BSA, were seen as rivals to other regional groups. Three years since its founding, the BSA began to lose membership (Cant 2006:784). Despite this and other problems, Simpson kept the BSA active, although greatly diminished in scope. By 1947 a new group, which did not include Simpson, was created. The Cave Research Group (CRG) pooled together the more "scientifically-inclined" cavers in the nation. Again, they aimed to create a national coordinating body. Unlike the BSA, however, they made sure that this group did not compete with the regional groups. Unlike Simpson, it did not coordinate its own explorations or make its own discoveries. The authorship of data contributed to the new national archive would remain with the regional group that explored and surveyed caves.¹⁸

I bring up the BSA records case to stress some of the complications related to the pooling of speleological knowledge even as efforts are made at methods control. While I have argued that the cadastre worked as a boundary object capable of bringing together

¹⁸ In 1973, the British Speleological Association and the Cave Research Group of Great Britain became one, forming the British Cave Research Association (the group that developed the survey standards that the Venezuelan speleological groups adopted in 1975). As Cant notes, "[t]he CRG and BSA's interests overlapped so much, that finally, speleologists realised they were all practising speleology" (2006:789).

diverse actors *within* the Venezuelan Speleological Society, among them there was no competition to individually discover and author cave maps. While cadastral entries *do* list the names of those involved in a specific cave's exploration and survey, the enterprise is seen as a collective endeavor, they remain the work of *la Sociedad*.¹⁹ Moreover, results are published in the group's *Boletín*, and thus become "open knowledge" instead of the personal property of any one individual. Let's recall the way the earlier Speleology Section managed its information. While technically "of the group," Speleology Section founder and long-time director Eugenio de Bellard controlled the group's archive in ways that were perceived as non-collaborative (not unlike Eli Simpson in the BSA case). This arrangement, however, might have suited the organization's historical structure just fine (at least for a while), a structure that honored the leadership of its founders.

This situation contrasted with the SVE's collaborative vision. This vision, it seems, worked as a filter of the organization's membership. Joining and staying in the group usually worked for those *already* comfortable with the team-oriented nature of discovery and authorship, regardless of seniority. As an SVE member once told me, "There is no space here for big egos." Which is not to say that individuals with strong personalities did not exist within the organization. However, regardless of these "personal geographies" that in the case of the BSA caused frictions and divisions, SVE members ultimately worked together. That is, they explored and mapped caves as a group (although not always *literally* together, not all expeditions included *all* Society members).

¹⁹ This contrasts to scientific research papers, also published in the *Boletín de la Sociedad Venezolana de Espeleología*. For example, the papers that resulted from the specimen collections that occurred during the 2008 expedition to Monagas are individually authored works. However, they are typically seen as contributing to the collective project, since without papers the publication would fold. See Note 6 in this chapter for a dissenting view.

The cadastre was the material instantiation of their pooled efforts. It was also the material instantiation of countless trips together to all corners of the Venezuelan territory during which friendships were forged as they experienced the cave landscape as a group. This contrasts to both the BSA and CRG cases noted above.

When new speleological groups formed in Venezuela, however, the question of how to manage national speleological knowledge emerged. In contrast to the British case, no single organization claimed to represent or coordinate the rest. By 1975 many members of the SVE had been exploring and surveying caves together for over a decade. They were not going to give this up. Also by this year the SVE had already published 10 volumes of its bulletin. By then, its cadastre included entries of almost 200 caves. Moreover, no other group had a publication with the circulation and international recognition that the SVE *Boletín* had already achieved. Pragmatically, the groups present at the meeting had little option as to where the national speleological cadastre would be published. Efforts were made to emphasize that even though the *Boletín* would house the cadastre, each group would remain author of their work. Indeed, since that meeting, the first page of the cadastre included the logos of the participating speleological organizations. The names of the specific explorers and surveyors, along with their organizational affiliation, are listed with each cave entry.

But as de Bellard and Hernandez's decision to opt out of this collaborative project attests, it was very difficult to separate the how from the why in the proposals to standardize national speleological knowledge. As I have noted, this was because *where* the results of these standardized results would be published was tainted with personal

rivalries. This issue limited the capacity of methods control to coordinate scientific knowledge among diverse actors.

The blurring between the how and the why in terms of methods control also is evident in the case of cave naming. In 1975 Venezuelan explorer Charles Brewer accused the SVE's president Juan Antonio Tronchoni of committing "scientific injustice" (Brewer 1975:1). In a letter to Tronchoni, he contends that his speleological achievements were not properly acknowledged in articles on caves in quartzite rock published in the Society's bulletin and elsewhere.²⁰ In 1971, Brewer organized an expedition that pioneered quartzite cave exploration after reaching by helicopter the top of Autana tepuy and then descending along the mountain's vertical wall to the cavern contained therein. He also organized another expedition that explored two vertical pits on Sarisariñama mountain.

Brewer's accusation focused on the two Sarisariñana pits, which he explored in early 1974. He was not alone in this expedition, nor was he the first to sight these geological formations. Beginning in 1970 air reconnaissance missions by geologists of CODESUR, a state-sponsored project to develop southern Venezuela, had already spotted these pits.²¹ Autana's cavern, which crisscrosses the mountain from one end to the other, also had been spotted. One of these geologists, who was an SVE corresponding member,

²⁰ At the time, Venezuelan speleology was drawing the attention of the international caving community. Geological finds in the country's southeastern region challenged the prevailing view that karst was a phenomenon unique to carbonic rock (Ray 1997). In fact, this region's table mountains contain caverns with major development (long passages) resulting from the same dissolutional processes in quartzite that produce most caves in more soluble limestone. They just needed much more time, something they have had to spare in this ancient geomorphological landscape (Wray 2010).

²¹ See Reig 2006/2007 on the views of nature implicated in the modernization of southern Venezuela in the 1950s.

alerted the group of these tantalizing leads. This information prompted over two-dozen expeditions to the area.

Among Brewer's accusations was that a research article published in the SVE's bulletin in 1974 about karst in Venezuela's quartzite did not mention his exploration that same year (Brewer 1975:2; Urbani and Szczerban 1974:27-54). To this Tronchoni responded that in fact the publication's editor (not Tronchoni) had received the article's manuscript by the end of 1973, several months before the aforementioned expedition (Tronchoni 1976:2). On a different 1973 article on Autana's cavern, Brewer repeats the charge of omission, adding that the author himself did not enter the cave and based his observations on those who *did*, namely, Brewer and his two National Geographic companions. Yet, the article's author *does* acknowledge his exploration by name (along with two American explorers of the National Geographic Society) in two photographic legends and in the acknowledgments (Colvee 1973:7, 11). That Brewer's name did not appear in the work's main text was, according to Tronchoni, the author's decision and not that of the SVE bulletin's editor (and certainly not his own). To this point he adds:

No text of a scientific article of any scientific magazine in the world leaves room for references of personal achievements nor heroic or valorous gestures. Humility and modesty characterize scientific work. [The reporting of] those epic gestures are left for weekly magazines or periodicals with which you so skillfully deal with. [Tronchoni 1976:2-3]

Again, we see the SVE argue that scientific practice is about both the *how* and the *why*.

With this statement Tronchoni further defines the group's scientific *and* moral identity in contrast to that of other actors. Within the Society, members who already identified with this vision applauded Tronchoni's intervention, promoting further internal unity. Again,

this illustrates the dialectic between the production of scientific knowledge and *la Sociedad*.

In fact, Colvee included a graphic of the Autana Cave in hopes that it would be published along with the article. The SVE bulletin's editor rejected the graphic, since he judged it as lacking scientific rigor. One member of the SVE eventually participated in an expedition to Autana, reached the cave by climbing the walls of the table mountain from its base, and surveyed the cavern. In the Speleological Cadastre of Venezuela, Autana Cave is Am. 11 (SVE 1976).

Throughout his letter, Brewer insists on calling the two Sarisariñama pits by the name of Brewer and Gibson. He contends he has the right to name them as he wishes since he was the first to explore them. Eugenio de Bellard also suggested names for these pits, Martel and Humboldt respectively (Urbani, Personal Communication, December 1, 2011)²². Brewer rejected this as an “arbitrary” gesture, since de Bellard “did not participate in their exploration” (Brewer 1975:1). Tronchoni qualifies as “sterile and inconsequential” both Brewer and de Bellard’s jousting on the naming of these pits. Brewer’s position, opines Tronchoni, “is less altruistic than Dr. De Bellard’s, who suggests naming these natural phenomena after imminent naturalists [as opposed to naming them after himself]” (Tronchoni 1976:4).

Venezuela’s efforts to establish toponimic guidelines began in 1967 with the country’s participation in the First United Nations Conference dedicated to normalizing geographical names. Also in 1967 Venezuela’s National Cartographic Office established the Geographic Names Section, in charge of investigating the matter. By 1970, this

²² In fact, since 1995 the SVE has recognized de Bellard’s suggested names as alternatives names to these pits (Urbani, Personal Communication, December 1, 2011).

Section had proposed a draft of a law on the matter. In his letter to Brewer, Tronchoni cites from this draft:

The change of already existing geographic names and urban nomenclature is prohibited. . . . In the case of using geographic names after those of people, it is required that (a) fifteen years go by after the death of the person in question, [and] (b) a favorable pronouncement only follows to acknowledge the merits of such person, in particular those accrued through services made to the collective. [Tronchoni 1976:6]

The SVE refers to these pits as Minor and Major Pits of Sarisariñama (Simas Menor y Mayor de Sarisariñama).²³

In a 2007 interview in his home in Caracas, Brewer again emphasized the right of explorers to name their discoveries (Brewer, Interview, May 31, 2007). He insisted that even the SVE is not consistent on the matter. He cited the naming of a cave in Zulia state after SVE member Francisco Zea. Yet, this is precisely a case that Tronchoni refers to in his 1976 letter to Brewer as acknowledgement of the group's past (prior to an established legal framework on the matter) inconsistencies. The SVE claims discovery of a cave it explored and surveyed in the region of Guasare in northwestern Venezuela in 1973 (SVE 1973). It decided to name it Francisco Zea in honor of a fellow member who had died in a helicopter accident while working as a fireman during a rescue operation in Apure state. "In other words," adds Tronchoni, "serving the collective" (1976:6).²⁴

²³ In 1985 the SVE reconsidered its position and changed the names to *Sima Mayor de Sarisariñama* or *Humboldt* and *Sima Menor de Sarisariñama* or *Martel* (Urbani, Personal Communication, December 15, 2011).

²⁴ Interestingly, the members of the expedition to this cave originally wanted to name the cave after a nearby town. Tronchoni suggested, however, using a name that resonated with the metropolitan population both of Zulia state and Caracas more broadly. He saw this as an opportunity to use naming strategically to raise the national awareness of caves (and the SVE's project). In this sense, Tronchoni was not unlike de Bellard, who treated caves worthy of iconic and monumental status. Still, and in radical contrast to de Bellard, Tronchoni accepted the arguments of the younger expedition members. Upon the death of

This exchange between Brewer and Tronchoni underscores the personal and ethical dimensions of exploratory practice that bear on the ways speleological knowledge is produced. The values that Tronchoni trumpets as defining the SVE as a collective, humble, and scientific effort echo the very themes that pervade the origin myth of the Society itself, when, in 1967, its active members left behind the institutional umbrella of the Venezuelan Society of Natural Sciences and created their own group.²⁵ For most of those older members who lived the 1967 transition, but even to those who came after, de Bellard represented egoism, aristocracy, elitism. Yet, in retrospect some understand de Bellard as "a man of his time," who, as many other elite men in Venezuela, honored seniority, particularly in a hierarchical and elitist organization such as the Venezuelan Society of Natural Sciences. Beyond (or perhaps because of this) what many SVE members regard as de Bellard's most problematic flaw was, in their view, his lack of scientific rigor. Recounting an episode that has become part of SVE lore, de Bellard contemporary Antonio de la Rosa recalls how de Bellard could not accept that part of his survey of Guácharo Cave was faulty:

He wouldn't accept it. He told me that I was a nihilist, a word I had to look up in a dictionary after our meeting. I then learned that it meant that I did not believe in anything. That I did not believe in *him*. That was part of his weakness, de Bellard believed *he* was speleology. [de la Rosa, Interview, September 18, 2007]

SVE member Francisco Zea died, the group agreed to name the cavern in his honor given the criteria that Tronchoni presents to Brewer (Urbani, Personal Communication, October 21, 2011).

²⁵ The term "origin myth" is not meant to suggest that the stories of this transformation are in any way false. Rather, it is meant to emphasize how central such stories have become in defining the very identity of the group, its members, its activities, and even, both the reach and limits of the knowledge they produce (Yanagisako 2002:39).

The shared antipathy among many past and present SVE members towards Brewer is even greater. For sure, Brewer remains an active explorer, still coordinating expeditions, with his most recent efforts again focusing on quartzite caves in southern Venezuela. A 2006 *New York Times* article features him as "an explorer, if such a profession can still be said to exist, in the tradition of his Victorian forebears" (Romero 2006). This is an identity that Brewer embraces, stating that "[m]y game is to discover" and routinely garners inspiration from reading travel accounts of European discoverers (Romero 2006).

Much like his *New York Times* interviewer, I was both perplexed and intrigued by Brewer's unabashed view of himself as "explorer," as a man born and raised as part of Venezuela's oligarchy. "I am for an oligarchy, an oligarchy of the well prepared," he stated, professing profound disdain towards Chávez (Romero 2006).

Ironically, both de Bellard and Brewer share in their desire and capacity to communicate their achievements through popular media. Eugenio de Bellard wrote many articles in newspapers and more exclusive publications that counted on an elite readership extolling the virtues of the nation's underground patrimony and the sense of wonder and adventure that characterizes speleological exploration. His narratives emphasized moments and protagonists of discovery, their adventurous qualities sometimes echoing religious symbolism. Brewer remains a formidable promoter of his pursuits whether with large format photography books, lectures, or film.

In their performative style of depicting and narrating their achievements as explorers, de Bellard and Brewer illustrate the seemingly "Western" attitude towards adventure (Rubenstein 2006:237). This attitude depicts the "conquering" adventurer who

is protagonist of his travails and his narration. In away, this performance through narrative is a critical constituting part of the adventure itself.²⁶

My third point, then, is to call attention to the way that difference in the amounts of narration signal different dynamics between what Simmel referred to as conquest and self-abandonment. By narrating their stories of head-hunting while representing vision quests in ways that resist narration, Shuar subordinate conquest to self-abandonment. Westerners, conversely, narrated their stories in ways that subordinate self-abandonment to conquest." As a whole, members of the SVE wholeheartedly reject such narrative style. But beyond style, this rejection marks an effort to make more "scientific," more "objective," the results of speleological inquiry. Moreover, this shuns any references that would make monumental either the place or the players implicated in its practice. This has consequences on the ways caves themselves were conceptualized and valued.

Valuing Caves

Alasdair Kennedy recounts the formative years between 1688 and 1708 when naturalists focused on making a geological field site and "philosophical landscape" out of northern Ireland's Giant's Causeway. He notes that "[i]t is the very particularity of the site that gives it value as an object of study" (2008:22). Himself critical of work that takes field sites as "self-contained units" from which scientific knowledge derives, he examines "the site" as only one component in a complex network of "intersecting locales within which scientists and science circulate" (Kennedy 2008:19).

In the case of speleological practice, caves too become "speleological sites" by

²⁶ I take up the contrast between adventure and exploration in Chapter 8.

virtue not just of individual caves' particular qualities, but by their entry into a system of others of their kind. This "entry" consist first of explorers finding, exploring, and surveying each cavern. As I will describe in Chapter 4, the process of surveying and mapping a cavern translates the characteristics of each site into a representation that simplifies and homogenizes dissimilar places through a process of inscription made possible by the invention of perspective. This representation then becomes what Bruno Latour calls an "immutable mobile" (Latour 1990:26-29;37; Rudwick 1989). Like others that have borrowed Latour's ideas, I am interested in following the trace of this representation, from the field, to notebooks, to archives, and beyond. Yet, I am also interested in understanding how this process of translation reflects back on the practice of exploration, the motivations of explorers themselves to do what they do *in the field*. In the case of the cadastre, much of the effect of these inscriptions derives from being part of a system. It is not just one cave inscribed, but one cave among many across a national territory that has been exhaustively and systematically explored, probed, and from a unique vantage point, represented. As I first argued in Chapter 2 and again here, this process echoes the collaborative mantra of *la Sociedad*, which rejects both geological and personal monumentality.

In many ways, naturalists' and popular focus on the Giant's Causeway resembles the natural and cultural history of Guácharo Cave. Both were sites with a rich history of mythical significance even prior to the attention of naturalists and scientists focused on producing accurate, "scientific" descriptions of the place. In the case of Guácharo Cave, this challenge was even more tantalizing, given the seemingly endless darkness that beckoned explorers. As individual sites, both the Giant's Causeway and Guácharo Cave

gained value as monuments, their particular geological, historical, cultural, and – particularly in the case of Guácharo Cave – ecological attributes weaving together to produce powerful icons of national significance. I contend, however, that there was an important shift in both the conception and practice of Venezuelan speleology that produced an alternative approach to Guácharo Cave as object and place of science. Once the SVE published its map of Guácharo Cave, the cavern became integrated into a national cadastral system.

Following toponymic standards that respect local names, the cave was in no way renamed. It was, however, assigned an index—Mo.1—that marked it as part of the Society’s national cave registry (“Mo” is short for Monagas, the state where the cavern is located, and the “1” refers to the fact that this was the first cavern that the group surveyed in the state).²⁷

SVE member Carlos Bosque emphasized that this impetus

presented an opportunity [to focus on science]... which gave exploration a more complete character. A consequence of this is that it gives caves more value. This is actually a very beautiful thing. A cave might be small but if it has petroglyphs, then it prompts more motivation for its exploration. [Bosque, Personal Communication, June 30, 2010]

²⁷ Following the Venezuelan Speleological Society’s own emphasis on the national cave registry prompted a shift in my own research, which originally focused on Guácharo Cave. During my fieldwork I learned that to narrow in on one cave missed the ways in which the value of each cave explored and surveyed depended on its being part of a broader national system, as system that translated geological features into a common, internationally recognized visual language. Moreover, such "one-cave" emphasis fetishizes caverns as bounded and cut-off spaces, instead of grasping them as part of a broader geological, hydrological, and ecological landscape. Exploration of this landscape, in fact, explains much of the appeal of Society outings for its members (see Chapter 6).

To Bosque, as well as other SVE members, to explore caverns systematically throughout the national territory, and to catalogue them using a common visual language, transformed their practice from exploration with colonial or eco-tourism overtones into a meaningful pursuit. This pursuit was a collective endeavor that rejected both geological and personal monumentality. Thus, there is more to this transformation of caves from field sites into maps, more than the mere technicalities of naming and cataloguing. It points to an ideological shift in the approach to speleological knowledge and practice, one that was deeply rooted in individual cavers' understanding of their own efforts, of their own place within the nation's natural and cultural landscape. At a more fundamental level, this view of caves corresponded to a particular epistemological stance on the need and method of producing and ordering knowledge of the world. This is a stance with roots in western imperial projects and ideologies, those very projects and ideologies that some SVE members hope to distinguish themselves from (Foucault 1973; Mignolo 2005; Pratt 1992).

Conclusion

In this chapter I present yet another perspective on the dialectic between sociality, scientific practice, and landscape. In particular, I analyze the production of speleological knowledge and of *la Sociedad* in relation to each other. As the group forged ahead with its national speleological cadastre, it helped define its internal unity among its diverse members. This was possible, I argue, because of the cave cadastre's quality as a boundary object. Not only did its members "come together at the map," in the words of SVE member Pedro Aso, they came together at the cadastre as this project promoted both the

exploration of more caves and their study and translation into objects of science. In the process, caves themselves were redefined as spaces of experience *and* part of a system from which they derived their value (at least to those that promoted speleological science).

With more speleological actors coming to the scene, efforts to coordinate the production speleological knowledge struggled to overcome personal rivalries. In this case, I suggest that “methods control” failed to bring *all* diverse actors together (although it did work for some) since these tactics did not separate the how from the why. Repeatedly SVE members involved in these debates stressed the moral and ethical dimensions of why certain rules ought to be adopted. This resulted in further galvanizing potential collaborators who had their own ideas about the kinds of speleology they would like to practice.

Finally, the national cave registry redefined caves from iconic sites that were important for what they contained or who had visited them to regular geological phenomena added to an archive, a network of many others of their kind. Here the language of science helped redefine caves. As one SVE member emphasized, this system made all caves valuable, regardless of their size or their geological and cultural histories. To grasp the relevance that this group puts on exploring and surveying any *one* cave requires understanding how and why it becomes part of a broader national system, a system that translates geological features into a common, internationally recognized visual language. Understanding how and why Guácharo Cave becomes Mo.1, I suggest, involves an anti-monumental gesture that also is mirrored in the group's collective and anti-personalistic rhetoric. As some Society members have told me, individuals such as

Brewer or de Bellard who were eager to promote their personal achievements as cave discoverers and explorers either are not interested in becoming part of the Society or do not last long after joining.

There is an important element to this story that I have hinted at throughout but have not addressed head-on, and that is the territorial politics of speleological practice. Although technically all caves are part national patrimony and speleologists do not physically appropriate the caverns they (sometimes) discover, (always) explore and survey, there is nonetheless a kind of territorial attitude present in the claim of one actor or another in authoritatively *representing* these spaces. Moreover, part of the moral and ethical attitudes linked to rules and standards of speleological practice contain in them elements of a national and even international imaginary that are worth exploring. I do this in Chapter 7. For now, let us turn to cave maps: How are they produced? This is the focus of the next Chapter.

Chapter 4

Exploring and Mapping Caves

With the end of the survey tape in my right hand, I crawled down a wide and low passage somewhere below the surface of Venezuela's Roraima plateau. The floor below me was covered in damp sand, smooth and regular, sloping slightly upward. As I forged ahead, ceiling and floor drew closer and closer together, obliging me to drop from knees and hands to my stomach. I pushed onward with increasing effort, propelling the weight of my body forward by pushing off with the tips of my boots and my hands and elbows. Like a gecko, I thought. My father once told me that geckos are enchanted creatures, embodiments of past cavers lost in the woods. Could they also be the reincarnation of the souls of cavers crushed by stone? Moving ahead became more and more laborious. I had to turn my head sideways to keep my helmet from getting stuck. It was at that point when it happened. Claustrophobia gripped my throat. It was not just the falling ceiling. It was the wet sand and the sudden fear of drowning. But I could see, as far as my light could shine, the passage continuing. To back off would mean not just abandoning what could be a promising passage, a key connection to more cave, but an incomplete map, a map with an open passage marked with a question mark.

To map this cave, indeed, to map any cave, requires this kind of bodily engagement with the underground. It involves an intimate experience with the world that is at once physical and affective, with emotions ranging from exhilaration to the kind of

fear that gripped me while I lay sandwiched between two slabs of stone. Yet, this bodily engagement also occurs in coordination with a disciplined social and material pulse of cartographic practice. Here, mapping is at once embodied, emplaced, *and* coordinated to an intensity rarely experienced elsewhere. Indeed, the body, or more specifically, bodies in synchrony with each other, *probe* the earth, their tools going in only so far as their owners push in and onward. This is because there is no technology that can accurately map a cave from the surface. Even locating caves poses dire challenges to existing technologies. Some geophysical methods such as negative density contrast, ground-penetrating radar, electrical resistivity, and 3-D seismic imaging afford some information on the possible existence and volume of "missing mass" underground, but applying these methods remains a challenge (Stierman 2004). The equipment involved can also be cumbersome and too expensive for most caving clubs around the world, so their use is typically limited to state or privately-funded engineering projects. Moreover, most of these tools are not accurate enough to determine the actual size of these voids, or whether or not there are several levels of passages. Gaps in the bedrock can be filled with air, water, or sediments, characteristics that are difficult to determine from the surface, not to mention the possibility that these spaces may house important mineral or archaeological artifacts, or even unique organisms that have adapted to these "extreme" environments. A 2004 *New York Times* article reporting the exploration of one of the deepest underground caves in the world echoes these technological limitations of cave exploration and surveying:

Sophisticated mapping has left very little room for dumb luck in surface exploration. But maps do not chart what lies beneath the land or ocean floor. "I'm not at all surprised that we're still making these sorts of discoveries [a vertical cave in Croatia 1,693 feet in depth]," said Lisa R.

Gaddis, the program chief of the United States Geological Survey's astrogeology team, "I think we have perhaps a better global picture of some other terrestrial planets, like Mars, than we have of some of the more remote areas on Earth." When it comes to caves, noted David E. Smith, chief of NASA's Laboratory for Terrestrial Physics, "we can't see anything from space." He added, "You can't really say very much, if anything at all, about below the surface." [Glassman 2004]

One must enter a cave to explore it, map it, and thus construct a representation of the enclosed space. This representation, in turn, enables the explorer to situate himself within what is often a maze of winding and overlapping passages. These practices grant an anachronistic second life to exploration that scholars often dismiss as a thing of the past. A recent volume on the anthropology of adventure begins stating that "[w]e live in a post-explorer era in which it is widely considered that the feats of the great adventurers are remnants of history and that the Earth's mysterious places and peoples have long 'been discovered'" (Gordon 2006:1).¹ In fact, cave explorers routinely make discoveries of so-called "virgin" caves and passages, underground spaces where humans have never been in before. Their expectation is that countless more such discoveries remain to be made. In his welcome message to the 15th International Congress of Speleology, held in August 2009 in Texas, International Union of Speleology president Andy Eavis remarked that "[p]robably no more than ten percent of the caves in the world have been explored and only a fraction of the potential cave science accomplished" (Eavis 2009). That much of this potential is accessible to individuals without major investments in sophisticated technologies makes this fact even more remarkable.²

¹ I owe Matthew Hull for the characterization of cave exploration as a case of anachronistic second life of exploration. I examine the notion of caving exploration as adventure in Chapter 8.

² There are other "frontiers" with "discovery" potential such as the deep ocean floor and space, but their technological barriers to entry hardly make them accessible to the

In this chapter I examine practices of cave exploration and mapping as examples that broaden investigations into the relations between scientific practice, sociality, and landscape. I already have remarked on the relatively low technological barriers to entry into these caving activities. The investment necessary to acquire relevant skills to engage in these practices is also relatively low. These two facts amount to an extraordinary ethnographic opportunity to study these activities, along with the potentials of “discovery,” in practice, in the field (see Lynch and Law 1999). I focus on cave mapping and the attempts to establish ethics, rules, and standards in the process of defining the priorities and boundaries of a community of practice, a topic addressed elsewhere in this dissertation (Chapters 2, 3, and 6). Key to these investigations are caves themselves as spaces where these issues play out in the field. How does a cave map come into being? What do these maps represent? Answering these questions reveals a distinct way of relating—physically, conceptually, and affectively—to the environment, its representations, and to others with whom we explore and survey this environment. Understanding these points again requires keeping the peculiarities of caves in the foreground. Indeed, the very definition of caves as objects of scientific inquiry and exploratory achievements depends on grasping the specificities of their exploration and mapping.

amateur scientist or explorer. There is one important exception in the caving world, and that is cave diving. While not necessarily expensive (certainly not within the magnitude of deep ocean or space exploration), this extremely risky activity does involve sophisticated scuba gear technologies, much of it developed by cave divers themselves (see Stone, am Ende, and Paulsen 2002). In this chapter, as well as in the rest of the dissertation, I focus primarily on “dry” caving, underground cave exploration that can and often does involve swimming or diving pools or subterranean sumps to make connections and advance discovery, but remains primarily a “dry” affair.

As I will show, cave mapping is an intensely social process requiring people to move not just in relation to the cave but also to each other. This process involves particular tools—for measuring, writing on, writing with, and lighting—that are specifically selected, designed, and/or altered to withstand the demands of the underground environment. It also involves an ethical commitment to the kinds of knowledge to be produced from this engagement. However, these commitments are in no way homogeneous, particularly within this diverse community of practice. Nor are they the dominant ideological forces that solely determine the form or meaning of engagements in/of place. While the goal of the cave map has been fundamental to the Society's identity as a scientific organization, it in no way represents the main motivation of most members of the group. To be more precise, it is the process of *mapping caves* that has energized the Society's membership and has made possible the conditions of the organization's continuity. This is because cave mapping requires a collaborative effort to *explore* them fully. This effort, in turn, depends on the map to determine the scope and potential of exploration. In the case of caves, cartographic and exploratory practices are in a dialectical relation that pivots around the scale and lived experience of the human body in contact with stone. Cave mapping challenges the depiction of cartographic practices as devoid of sensorial and poetic engagement with/in the world.

Mapping Caves

I experienced that memorable pang of claustrophobia in 2004 when I joined the Venezuelan Speleological Society on an expedition to map a cave perched within Roraima Plateau, located in southeastern Venezuela. Almost three thousand meters high,

this plateau's surface evokes a sense of other-worldliness, with balancing rocks and shapes carved by erosion during 70 million years, longer than most places on earth (Wray 2010:85). Near the southern edge are a series of entrances to an even more peculiar world, unlike anything above ground. It is amorphous, alternatively dry and wet from the rain that trickles through cracks, with unusual formations composed both of mineral and organic matter, and most of all, a space filled with absolute darkness, except for twilight zones near shafts and entrances that let sunlight in.

Since 2003, the Society, at times collaborating with international caving groups, had been exploring and mapping what they have called Sistema Roraima Sur, or Southern Roraima System (SRS). To date, the Society claims it is the longest quartzite cave in the world, with 10.8 kilometers of surveyed length (SVE 2004).³ This 2004 expedition brought together both more veteran and younger members of the Society, along with cavers from Spain. The trip was also a family event, with my father, a life-long SVE member, deciding to travel to Venezuela to join the expedition with my mother, two brothers, future husband, and myself in tow.

The basic principle of cave mapping involves creating a scaled two-dimensional line plot that represents the length, horizontal orientation, and vertical displacement of cave passages (refer to Fig.3.2). The basic tools are measuring tape, compass, and clinometer. As early as the 13th century, Tuscan miners used floating magnetic needles to determine the direction of underground passages. By the late 15th century, Italians and

³ There is an ongoing dispute over this cave, which members of the Slovak Speleological Society and the Czech Speleological Society also have explored and surveyed and call Crystal Eyes Cave (Smida, Audy, and Vlcek 2003). The SVE filed a formal complaint to the International Union of Speleology claiming that these cavers breached international caving ethical standards (SVE 2005). I examine this case more carefully, in the context of international caving politics, in Chapter 7.

Germans had embraced the compass as the standard mining way-finding equipment. Until recently, Agricola was considered the author of the first known printed plan of a human-made cave, published in 1546 (Shaw 1979:20). The first printed map of a *natural* cavern, however, appeared in 1638, in a publication titled “A description and draught of Pen Park Hole in Gloucestershire” by Robert Southwell (Wookey 2004:714). That distinction now lies with Belgian artist Odon Van Maelcote who engraved two maps of Sicilian caves of religious significance (Mancini and Forti 2009).

Interestingly, the basic principle of cave mapping has changed surprisingly little. I first learned and practiced this principle in a course on cave mapping and cartography at Western Kentucky University in 2003. But it was in Roraima that I tested my skills in so-called “virgin” passage, cave that no one had ever entered before or had any idea of where it might lead. During the morning of the first day of work, we broke up into three survey teams. There were three of us in my group, with my father as the most experienced (or at least, the most senior) taking on the role of sketcher. As sketcher, he was responsible for taking notes of the cave’s shape and measurements in his water resistant survey notebook. He did this in pencil since ink might smudge and run if wet. A compass to measure horizontal displacement and a clinometer to measure vertical displacement hung from his neck, both instruments connected by a string. I was assigned the role of tape leader. Paco, one of the Spanish cavers, accompanied me when he was not exploring ahead or in some side passage “scouting” out the cave.

As tape leader, I was always ahead of my father, unrolling the survey tape that physically connected us and measured the distance between us. My job was to move ahead in straight-line segments, as much as the cave allowed, and to establish survey

stations, points at which measurements would be taken.⁴ To determine the segment's azimuth (bearing), my father peeked through the viewer of the hand-held compass, and read the value that coincided with my headlight in the distance. Similarly with the clinometer, which provided the inclination (vertical displacement) between the point I was standing at and his previous "station." I had to stand still to provide a steady light in the dark distance. As the sketcher of the team, my father entered the following values in the left-hand page of his survey book, already prepared with columns to enter survey data: the name of the passage segment between two points (for example, "1-2"), the compass bearing, the vertical displacement, and the distance between these two points. He also marked the distances to the ceiling, to the floor, right, and left on the facing page in his notebook, where he swiftly sketched in freehand the plan view, or view from the top, of the passages we traversed. A number value next to the passage sketch corresponded to its estimated width, while a value in a circle corresponded to its height, also estimated.⁵

⁴ There are many ways of marking survey stations, which vary widely in their impact to the cavern, while others opt for leaving no trace or mark at all. In caves with no flooding risk, some cavers opt to leave a small piece of mylar tape with the station name written with permanent marker. Others resort to more permanent options, particularly in caves that are muddier and wetter: a poker chip with a small perforation through which runs a small piece of wire that can then be attached to a protruding rock formation is an option for some. In Venezuela, I witnessed some stations marked with the soot of the carbide flame of the cavers' headlamp. In the 1960s, prior to a more ecological sensibility to the cave environment, some cavers actually painted the names onto rock formations and walls within the cave.

⁵ Sketchers – indeed, cavers – with more experience are better able to estimate sizes and draw details with greater accuracy without compromising swiftness. In some areas of the world, caving groups have access to laser pointers that accurately measure such distances, but they remain relatively costly and delicate technologies that are not accessible to many, and some would argue, not really necessary to produce an accurate cave map. Learning proper skills, especially those that result in better communication and teamwork among the members of the surveying team, is crucial for achieving more reliable results

Once the three different teams agreed upon which passages to start their work, my father took out his survey notebook from his waterproof backpack, ready to begin sketching. He stood in what we determined as point 1. He drew a dot in the graphing paper corresponding to this spot. I then moved along the cave passage ahead of me, unrolling the survey tape as I went, looking around me, and ahead of me, the beam of my headlight in a constant swirl, searching for any salient features (such as side openings to other passages or a sudden change in elevation or the presence of formations) that might warrant I stop and establish the second survey station. I stopped next to what appeared to be the opening to a side passage. “On station!” I called back and read out loud the distance off the survey tape: 12 meters. I stood still, facing my father, as he focused on my light as a point in the distance to measure the horizontal orientation of the passage between survey station 1, where he stood, and survey station 2, where I stopped. Ten degrees. This segment of the passage, then, veered slightly northeast. There was no vertical displacement—I had neither gone down nor gone up along these 12 meters of passage (Fig. 4.1). My father estimated to 5 meters the height of the passage at his point, and to 10 meters its width. He also quickly looked around him, sketching any salient features, including the contours of the walls that contained us, as one would represent the lines of the embankment of a river. A curvy arrow signified a water stream running along the passage’s floor. A square represented large stone boulders in the passage. When he was ready and had caught up with me (winding up the survey tape along the way), I

in the cave mapping process. But most fundamental of all, a cave that is to be mapped is a cave that must be explored and traversed. Shying away from an ongoing passage increases the likelihood of producing an “incomplete” map, of reducing its accuracy, of casting doubt on the entire cartographic project. Finally, shying away from an ongoing passage raises questions about one’s reliability as a survey team member.

turned again to face the dark passage ahead of us, again unraveling the tape measure as I carefully moved along. "On station!" again I called out. Distance: 7.5 meters. Compass reading: 10 degrees (no change in orientation). I stopped at a point where there appeared to be another passage to my right and a small pool of water to my left. This was survey station number 3. The process repeated itself for several hours, as we moved along what appeared to us to be the main cave passage. Exploring and surveying those tantalizing side openings that we passed along the way would remain pending for us later or for another team to take on.

Several times in Sistema Roraima Sur, while our survey team took a break or gathered with members of other teams in those exciting moments when we realized we were connecting different cave sectors, I glanced at my father's field notes. As the plan view of the cavern began to take shape, we were able to use it as a representational tool that helped us determine where we were and where we had been. His sketch worked as a "computational device" that affords a more reliable and graphic sense of creating and maintaining "positional consciousness" in much the same way that navigational charts help seafarers locate themselves within a vast sea (Burnett 2000:100-101; Hutchins 1995).

Cave mapping is a team effort. Moreover, team members must be aware of each other's position and movements as they negotiate the cave environment that encloses them. For one, the tape leader has to select points that balance survey accuracy and the team's resources: time, food, lighting fuel, and stamina. Establishing too many stations might produce a more accurate map, but when considering the scale at which the cave will eventually be represented, the difference between twice as many or half as many

stations might be negligible. In Sistema Roraima Sur, for example, what we thought was a five-day work session was cut down to three due to problems with our permit, which we thought had been cleared in Caracas, prior to our trip down to Canaima National Park.⁶ Thus, we knew we had to work swiftly, aware that trips to this region of the country represented a more serious investment of time and resources, relative to other cave areas of the country. Moreover, the selection of stations requires the consideration of the physical conditions of fellow group members, who will proceed to stand—or sit, stretch out, crouch, or hang—at the selected station, where they require time to produce a sketch of the passage just traversed (for example, stopping at a point under a gushing waterfall makes no practical sense). Also, each leg must be a straight shot connecting the two points. Otherwise, the survey tape will bend and thus the distance reading between the two points will not be accurate. Also, the tape leader must stand at a point where he (his helmet light) is visible to his partner behind him since that light serves as a reference point in the otherwise pitch black horizon. Two important consequences result from this process: The first is that every member of the survey group is acutely aware of all other members' physical condition in relation to the cave environment and to each other (or at least they should be, if the surveying is to be done successfully). The second is that the sequential construction of the cave map, as determined by the progressive addition of stations, is a function of the interplay of spatial and material qualities of the environment, the physical and social qualities of the group, and their tools.

These qualities make cave surveying a distinctly *disciplined* process that requires

⁶ I describe this incident in more detail in Chapter 7.

particular ways of moving and perceiving.⁷ Once enveloped in the complete darkness of a cave, pierced only by the limited scope of our headlights, I realized not just the importance of working in teams, but of communicating in the process. Indeed, to speak of the “physicality” of caves is incomplete without considering the dynamic light and soundscapes that fill the underground space (Bille and Sørensen 2007; Helmreich 2007). They are dynamic because human bodies are in constant movement (Ingold 2000, 2007; Macpherson 2010; Massey 2005; Rose 2006; Thrift 1996). If I did not speak clearly, my father might not write down the correct distance measurement. I also had to remember to tell him whether I was no longer standing. Not knowing could introduce an error of +/- 1.5 meters at every survey point.

Although I did not take on the role of sketcher while in Roraima, having done so during my cave and cartography course in Kentucky back in 2003 taught me the importance of selecting survey stations strategically. I needed to balance swift and efficient work with accuracy as I made choices about where to establish the next measuring station. My observations and explorations of the cave passages informed this decision. Are there sudden changes in the inclination or surface features in the passage? How far can I extend a survey leg prior to hitting a bend that will not allow for a straight

⁷ To some in the caving community in the United States, in fact, cave surveying muddies an unencumbered and somehow truer and more intimate experience with/in a cave. These same individuals, in fact, reject the very ideology of cave mapping that is central to caving as a "scientific" pursuit (Chabert and Watson 1981:7). I will return to this topic further on. I did not encounter this sentiment among any of the members of the Venezuelan Speleological Society that I interviewed. However, this is most likely because their condition as members of this group already aligned them with the view of cave maps and mapping as a fundamental part of speleological practice. It also is possible that many reject this view as a false dichotomy between exploration and mapping. In fact, I argue a position similar to this. In the cave environment, exploration and mapping are interdependent in the cave environment.

shot of the measuring tape? Moreover, how far can I go before my teammate ceases to be able to see my headlight? Are there dripping water or pools, or even delicate cave formations ahead, which constrain determination of a station? As I learned in Kentucky, I roughly attempted to place myself along the middle of the cave passage, although sometimes, because of the irregularity of the cave floor, this was not possible. In Roraima, Paco suggested I do my best to establish segments with distances measured in whole numbers, or at least, half numbers. Why stop at 12.8 meters if you can stop at 13? These decisions, he explained, help diminish error in data entry, not just in the surveyor's journal, but also eventually in the transformation of these data into a properly scaled and oriented line plot of the cave.

These concerns not only required constant awareness of and engagement with other team members and with the distinct affordances of the cave environment (Ingold 2000:166-168; Gibson 1979). They also reflect an awareness of the purpose of the activity enfolding: to thoroughly explore and survey underground passages *in order to* produce a two-dimensional representation of the space, along with a detailed description that would eventually lead some to propose hypotheses of how it might have formed. As I describe in Chapter 3, embracing this purpose was and remains fundamental to the Venezuelan Speleological Society.

Before turning over to a detailed analysis of the “views” that cave maps confer, I want to stress the fact that the principle of cave mapping holds regardless of the specificities of the cave environment. These environments are extremely diverse in terms of size, shape, temperature, presence/absence of water, and ecologies contained therein. In navigating this landscape, whose characteristics become evident only as they unfold to

the moving/sensing body, survey teams are exploration teams in the full sense of the term. Together, members overcome physical challenges (their own and the cave's) and sometimes expose themselves to great risks. Viewed from this perspective, cave exploration is in the same category as other adventure pursuits such as mountaineering and rock climbing (Cosgrove and della Dora 2009; Ortner 1999; Ness 2010). My ethnographic accounts of cave mapping do not emphasize its sporting qualities because they took place in less challenging caves (relatively horizontal, not requiring technical climbing skills nor endless tight passages).⁸ My limited experience precluded me from participating in more challenging engagements. During an 2008 SVE expedition to northern Monagas, I waited along the edge of a deep pit as the three more experienced members of the group selected a sturdy tree to secure their rope, and one by one, rappelled down into the underground to explore and survey the cavern. That brief moment during which these three men negotiated the sturdiness of their anchor and then followed each other into the unknown illustrated the importance of collective trust as they faced the risky prospects of exploring the deep pit. No one knew how far and where it went, but together, they would find out.

@@Cave mapping is filled with instances such as these when team members must work together towards a collective goal, all the while facing both the risk and thrill inherent in cave exploration. To my cave surveying instructor, Pat Kambesis, cave exploration has the potential of producing special bonds among its actors since they are constantly putting their lives at in the hands of others (Kambesis, Personal Communication, August 5, 2011). That 2008 event also illustrated their commitment to

⁸ But see Chapter 6.

the speleological enterprise as a collective pursuit. Neither of them would be crowned as the “discoverer.” The map would be a product of *la Sociedad* (including all of us onlookers who together carried equipment out to this point deep in the forest).

Vision and Perspective in/of the Cave Landscape and Its Representation

Chapter 2 provides a preview of the elements of the cave map, in that case of Guácharo Cave. Here I want to consider the cave map in more detail. The final map of Sistema Roraima Sur, published in the 38th volume of the *Boletín de la Sociedad Venezolana de Espeleología*, represents three perspectives of the cavern (SVE 2004). The first is a plan view, or view from the top (Fig. 4.2). This requires an imaginative leap: the fantasy of observing the cave from above. But “above” where or what? Certainly not “above” the cave, since this (in theory) would amount to “seeing” the outer shell of the cavern, as if we were standing on the top of a water pipe looking down. Another imaginative leap is required: “slicing” the pipe horizontally along the plane determined by the position of the sketcher and “opening it up.” What the cave cartographer represents with the plan view then, is the inner contour of the sliced pipe. Two measurements (or estimates) aid this process. At each survey point, the sketcher notes the distances, from this point, to the left and to the right walls of the cavern. This is anything but straightforward (Chabert and Watson 1981). What if to the right of the sketcher there is a wide limestone column? Is this the wall or should the column be considered an element contained within the passage? Moreover, the sketching team usually does not physically traverse along all inner contours of the cavern, but roughly along the middle of the passage. This means that the sketcher often relies on vision (which is only as good as his lightsource) to

ascertain the shape of these contours. There are exceptions to this. In tight passages barely big enough for one's body to pass through, the landscape is not so much seen as experienced.

The intimacy with the landscape that cave mapping affords (indeed, *demand*s, given the technological limits described above) is categorically different from any other kind of cartographic and exploratory endeavor. Surface surveying has been and remains a practice of defining and delimiting the landscape at a distance. In the cartographic toolkit of empires focused on defining their territories, options included determining the location of "control points" by astronomical readings and the distance between them (Edney 1997:19). Yet, as Matthew Edney notes in the case of imperial Britain's mapping of India (1997), these astronomical readings were plagued with uncertainties, putting into doubt all other measurements that depended on them (1997:18). The introduction of trigonometric survey techniques appeared to solve these problems since they offered a mathematically rigorous way of linking the location and relative distance and angles among these points that did not depend (or depended much less) on astronomical readings (1997:21). As Edney argues, techniques such as these helped fuel the faith in a cartographic ideal: that more sophisticated technologies could deliver complete and accurate knowledge of the real world as is, and that, moreover, this knowledge could be effectively archived and utilized to further the imperial, scientific, and capitalists interests of its architects and producers (1997:24). Yet, when viewed in practice, these technologies reveal serious shortcomings that explode the myth of empires as monolithic and all encompassing (Edney 1997:25). Even while "following" surveyors along roads, in entangled relations with inhabitants, struggling to make technologies work properly in the

field, these survey efforts and the engagements with the land they afford remain limited along paths that either circumvent, connect, or delimit “control points” used to anchor and connect two-dimensional views of the landscape.

Exploring the intimacies and entanglements produced along these paths is a task that some scholars have taken up. Their efforts do not just question the view of the monolithic and all-encompassing empire. In a recent example of such efforts, Mueggler follows the trail of British imperial geographers and botanists in early twentieth century China (2005). In these accounts, the theodolite as a powerful technology of perception plays a key role in surveyors’ capacity to construct these views and enact (or think they can enact) this cartographic and epistemological ideal that Edney describes. Critically, theodolites are delicate and cumbersome tools to carry across the landscape, which remains, even in efforts to get away from proscribed paths, a visual object (Mueggler 2005:451-452). Even in the case of the traverse survey, which Graham Burnett examines in the case of the mapping of British Guiana, cartographic practice remains bound to a series of paths that connect “nodal points” that fix surveys in the landscape (Burnett 2000:129). As the traverse surveyor moves along paths that eventually will represent boundaries in maps, the bodily engagement with the landscape remains limited to a minuscule portion of the area these maps aim to represent. Indeed, these maps and the practices involved in their production remain wedded to an epistemological project whereby vision, aided by increasingly sophisticated technologies, defines the object.

Traversing the landscape, surveyors and explorers alike, rely on vision to anticipate the course of their journeys. This is true even in environments lacking landmarks that aid orientation. Whether guided by stars, a point in the horizon fixed by

the sextant, or a GPS reader, the traveler usually is able to see what comes ahead (or at least imagine with relative certainty what awaits). Mountaineers and rock climbers, who also produce route maps, are able to envision their next move, even prior to what undoubtedly is an intensely embodied engagement with the landscape (Abramson and Fletcher 2007; MacLaren, Higgs, and Zezulka-Mailloux 2005; Ness 2010; Ortner 1999).

In cave exploration and mapping, this reliability on vision (even when technologically aided) to inform anticipated moves through the landscape is very limited, if not impossible. Indeed, the reliability of vision is a function of the intensity and range of the team's lighting sources. Unlike landscapes that are awash in light, deep in a cave darkness is absolute.⁹ This changes as explorers penetrate passages with their lighting technologies, usually propped on their heads, leaving their hands free to climb, crawl, or slither along. The result is ever shifting lightscapes, "changing landscapes of light and darkness" that determine "the appearance of the world" as they cast "shadows in the relationship between things, persons, and light" (Bille and Sørensen 2007:267). These lightscapes are ever shifting, because light is on the move hinged to the explorers' bodies. To light one's way, to see where one is going, requires deliberate bodily motions to scan the surroundings. This is done piecemeal; only where the light shines does a portion of the cave become visible. As soon as the scanning proceeds, darkness quickly gobbles this portion up. As a survey trip lengthens and the demands the cave traverse makes on the physical capacities of its explorers increases, this seemingly simple task of "scanning"

⁹ More light does not always mean more capacity to visually perceive one's surroundings. An arctic explorer or mountaineer in a windy snowstorm, even if they happen in the middle of the day, can be completely paralyzed by their blindness. In these cases, one can appreciate the capacity to perceive *contrasts* in the landscape.

the surroundings with light contributes to overall exhaustion.¹⁰ During my first experiences as sketcher, I recall the frustration of trying and failing to “take in” a view of the cave that contained me. I cursed the low quality of my headlamp, swearing I’d buy the best headlamp in the market prior to my next cave experience. In effect, I imagined the beam of my light as a miner’s shovel attempting to dig through the thick darkness.

As it turns out, actually drawing the plan view amounts to sketching wiggly lines of variable accuracy, a practice that improves with experience. Paul Carter ponders on the meanings of the cartographers’ lines as his boat navigates the shoreline. This is no easy task: the boat never is still, never at a precise or constant distance from the shore. The gesture of tracing on paper that line with ink, is, at the end, part imaginative, part creative, with only limited relation to a “reality” that is difficult to define, to bound (where, after all, does a coast begin and where does it end?) (Carter 1999). The final result of sketching the cave’s plan view looks like two lines representing the shoreline, on each side, of a river, with its “central axis” corresponding to the straight lines connecting each survey station. These survey lines represent the *actual* physical traverse of the surveyors within the cavern.

Once this inner contour of the cave is drawn, the sketcher adds some detail of the elements contained within the passage. Using a series of established symbols, the sketcher marks ascending or descending slopes, streams or puddles, the presence of speleothemes (stalagtites, stalagmites, flowstone, etc.), whether the ground amounts to sand or large rocks or “breakdown,” etc.

The second perspective of the represented cavern is its “profile” (Fig. 4.3). This

¹⁰ This specially is true if the explorer’s main light source is an electric light connected by a wire to a large battery pack located on the back of the helmet.

view slices the cave lengthwise along a vertical axis. It requires projecting all of the segment lengths onto one same plane using simple trigonometric conversions. Thus, this side view does not represent actual distance traversed, what cavers refer to as continuous linear development (Chabert and Watson 1981:7). What it does do is give a visual representation of the verticality of the cavern, how high or low passages are, where they slope up or down, and also how several levels of passages relate to each other spatially.

A cavern's final map contains a third and final perspective, its cross-sections.¹¹

These cross-sections correspond to yet another vertical slice of the cavern, this time along a plane perpendicular to the explorers' traverse. The afforded view is the same that a doctor might show a patient to emphasize the amount of obstruction present in an artery. Thus, cross-sections give no sense of length of passage, but do give good detail of the shape of the passage at any one given point. These representations are drawn while in the cave, usually at a point corresponding to a survey station. They are challenging to sketch, especially for an inexperienced surveyor. Like the plan view drawn as one maps a cavern, these cross-sectional perspectives require an imaginative leap as we run our eyes along the contours of the passage. The tendency to draw depth perspective must be suppressed, emphasizing instead a flat two-dimensional vertical slice of the cavern along the plane perpendicular to one's traverse. These cross-sections are then featured in the final cave map composite, usually with a line graphically linking them to the point along the plan view that corresponds to where they were actually drawn.¹²

¹¹ The Sistema Roraima Sur final cave map has no cross-sections, but the Guácharo Cave map discussed in Chapter 2 does. See Fig. 2.6.

¹² As Shaw makes clear in his history of speleogenetic theories, accurate cross-sections provided naturalists valuable information that eventually led to how these passages may have been formed. But to produce these views first required that these naturalists head

The “Mapping What You Survey” Imperative

As I describe in Chapter 2, my father learned to survey caves with his friend Omar Linares. They applied in the field what they saw in published cave maps that they sought out in libraries in Caracas. I pressed Linares to tell me how they learned: “Nobody taught us! We taught ourselves,” he insisted (Linares, Personal Communication, September 19, 2011). His also was an affirmation of valued traits that I have heard other early members of the Society echo: the traits of independence, self-reliance, and initiative. The Society was and has never been a school, although as I describe in Chapter 3, efforts to formalize training have been made. Most veterans scoffed at this, or participated only half-heartedly. One learns by doing, the mantra seems to state. One learns by giving it one’s all (“echándole bolas!”).¹³ With enough members of the Society espousing this mantra, either implicitly or explicitly, Tronchoni’s vision of an open and welcoming group was challenged, or at least complicated. I will return to this theme further on. For now, I want to consider some of the differences between my father’s surveying style and my own, which I learned in the formal setting of a *class*.

For one, my father did not sketch to scale, nor did he plot the actual segment orientation values that he obtained with his compass. Thus, a cave passage that actually meanders for 11 meters in a 40-degree direction and then ten more meters at 38 degrees is sketched as an ongoing passage with no directional change or attention to the actual length of passage. When I explained to him and other Society members that in Kentucky, I had been taught to sketch to scale, using a small protractor to measure the actual angles

underground to observe the cavern, and from there determine two-dimensional perspectives that might best represent what were often complex and always three-dimensional geological phenomena (Shaw 2004).

¹³ See Chapter 6.

of the cave passages and a small ruler to connect my survey points on paper, they laughed (refer back to Fig. 3.2). Most poked fun at what they saw as typically fastidious and ultimately inefficient “gringo” ways of doing things. I begged to differ, defending my instructor’s argument that by learning to use these tools well and by producing the most accurate map while *in the cave*, errors could be avoided, or at least corrected before an expedition was over. My defense, some further joked, only proved how thorough and socialized I had become in this country I now called home.

Seven years later, when I returned to my father’s field notebook in an attempt to *see* exactly what portion of the cave we had surveyed, he conceded that had his sketch been done to scale, incorporating actual passage orientation, that would have been an easier task. I felt vindicated. I could have, of course, plotted the values of each line segment in survey paper. But that was exactly what he had already done shortly after our return to Caracas after the Roraima expedition. He handed these notes over to his friend and fellow SVE member Carlos Galán, who collected all survey teams’ notes and produced the final cartographic representation of Sistema Roraima Sur. Galán, having in his possession my father’s scaled and properly oriented survey notes, was able to spare me the effort of using ruler and protractor. He sent me an image of the cave map highlighting the passages my team had surveyed (Fig. 4.4). Even then, it was difficult for me to *read* my father’s field notes and establish a correspondence between them and the final map.

Most cave explorers understand that a cave explored ought to be mapped. This imperative, which was part of Martel’s vision of speleology, has become virtually ubiquitous among cavers all over the world, whether their inclination is towards the

sporting or scientific aspects of cave exploration (Watson and Chabert 1981). For the Venezuelan Speleological Society, a key part of its identity as a scientific organization rested on the acceptance and execution of this imperative.

My Kentucky instructor's insistence that we map the cave as we surveyed responds to a key concern: that greater survey accuracy be achieved *while* in the field. Mapping as one surveys requires a commitment to be more vigilant of one's surroundings, something that translates to more data in the field book that will then be used—elsewhere in the (hopefully near) future—to draft the final map and report. More complete survey notes reduce the interpretative guessing game sometimes involved in drafting the final map from notes poor in detail. Moreover, detailed survey notes make them more legible to others who eventually might be involved in the final drafting of the map, as was Galán's case for Sistema Roraima Sur. A particular ethical stance informs my instructor's cave surveying approach: that caving is a collaborative process with effective communication as its primary goal. Who could disagree? Despite different approaches in the field, certainly not my father or any members of the Venezuelan Speleological Society who have embraced mapping as a fundamental quality of their activity, precisely what distinguishes them from leisure cavers or eco-tourists.

In a 1988 editorial in the U.S. caver periodical *Compass and Tape*, John Ganter extols the importance of transforming survey notes into maps. Survey notes, which, at their minimum, amount to line plots (those segments connecting points representing survey stations), are not enough:

The survey traverse is a metric artifact of the way we orient ourselves underground. . . . [I]t is just a data display. A data display becomes a map when a human gets involved and performs a *subjective* interpretation of the data. The human thinks, and the thought goes on the map. There is

something here; it is represented by this symbol. A drop is here; they will need this amount of rope. This is a good lead; they will need to dig. As the Mapper interprets the cave, using notes, the traverse plot and memory, he or she creates through words and graphics an explicit document telling about the cave. The process is laborious, but the product communicates and explains, laying the foundation for future efforts. [Ganter 1988:2]

Citing Michael Polanyi, Ganter argues for the need to convert survey notes (tacit knowledge) into maps (explicit knowledge): “So how are we to learn about caves, to ‘see’ them, unless tacit knowledge is promptly refined into maps and descriptions?” (Ganter 1988:1). A commitment to this transformation espouses the idea that caves are to be explored *and* made visible, made legible, to a wider audience, whether current or future cavers within one’s own club or society, and beyond. In practice this dictum is fraught with tensions. Some cite the concern that the best-conserved caves are those not made visible at all. Their locations are kept secret. Maps, if produced, are not circulated. Others jealously guard their exploratory efforts, particularly if they hold potential for significant discoveries. Information leaked of this potential could lead to “getting scooped” by a competing caving group. Central to the discussion here is that a more thorough appreciation of a politics of speleological knowledge production begins in the field, in that very space that is simultaneously a stage and object of inquiry.

Deeply committed to both the “map as you explore” and “map what you survey” dictums, the members of the Venezuelan Speleological Society 2004 Roraima expedition organized a dinner party once back in Caracas. In fact, the main purpose of this event was to make sure that all sketchers of the recent survey effort do precisely what Ganter describes: transform individual survey notes into explicit knowledge in the form of a map readable by others in the team. There was special interest that my father do his part, since he was about to return to the United States. I sat next to him as he plotted out to scale,

and with proper orientations, on graphing paper the data points we had gathered during our exploration of Sistema Roraima Sur. He used a ruler and a simple protractor, the same kind that high schoolers use in an introductory geometry class. Here on this dinner table in the apartment of an uncle, who agreed to host the party, overlooking a Caracas neighborhood lush with tropical vegetation, there was no concern about light. Nor was there any concern with dropping one's tools in water or mud, the dirt stains on his field notebook reminding us how conditions are otherwise back in the cave. Better yet—for me, at least!—there was no fear of claustrophobia, the very high and smooth ceilings a safe distance from one's head. As my father drew the plan view, the shape of galleries began to take two-dimensional shape. I strained to remember precisely where we had been, to find a one-to-one correspondence between what I saw represented on paper and the memory of traversing passages. “What about that point where I did not continue, where we had to turn back but the passage did not end?” I asked. “That point I mark here with a question mark (*una interrogante*),” my father replied. On a follow up expedition cavers would return to this point and explore further, if possible. If not, the question mark would remain, a symbolic reminder of the human limits of exploration, a reminder of cave's resistance at being completely bounded, totally knowable.¹⁴

Challenging Dichotomies of Ways of Experiencing/Representing the World

As my father sketched the innards of Sistema Roraima Sur, his drawings on his water-resistant field book of the cavern's plan view resulted, in part, from an imaginative

¹⁴ Juan Antonio Tronchoni, along with other SVE members who did not participate in the SRS expedition but were long-time friends of my father, attended this dinner party at my uncle's home.

perspective of the inner volume that contained us. This "imaginative perspective," however, might better be referred to as a shift in perspective, or a "projection" made possible by our cave traverse *and* our coordinated efforts as a team using particular tools. To refer to the plan, profile, or cross-sectional views as "imaginative" however, risks characterizing them as somehow fictitious, with no relation to reality. Furthermore, it risks relegating the resulting representation as the product of a disembodied mind. In fact, this cave surveying process is a powerful ethnographic example that supports various scholars' theorizations that emphasize the distributed, phenomenological, and ecological quality of human cognition (e.g., Bateson 1972[1955]; Gibson 1979; Hutchins 1995; Ingold 2000; Merleau-Ponty 2005[1945]).¹⁵ It also illustrates "the ways nature, place, and person become entangled in the practices of documentary production" and how these practices in turn can be understood as "technologies of perception with the power to shape many forms of relatedness," a point that I will return to repeatedly throughout (Mueggler 2005:722, 724).

Comparisons to other representations of the underground (and the conditions of their making) are in order. In a creative and thought-provoking attempt to lay out the foundations of a "comparative anthropology of the line," Timothy Ingold argues that many of the activities that both human and other beings engage in to make themselves home in the world involve the making of and movements along lines (2007:1). He suggests a general taxonomy of the line, which includes threads and traces. A thread is "a filament of some kind, which may be entangled with other threads or suspended between

¹⁵ This extension of cognition beyond the domain of the mind, what Hutchins's refers to "distributed cognition" (1995) is, in the opinion of some, precisely what anthropologists refer to as "culture" (see Ortner 2001).

points in three-dimensional space" (2007:41). A trace is "any enduring mark left in or on a solid surface by a continuous movement" (2007:43). Lines' potential as objects of ethnographic inquiry lies, in part, in their capacity to turn into one another. Particularly in the case of traces, their relationship to different kinds of surfaces intrigues Ingold. He explores this relationship in his discussion of mazes and labyrinths. It features productive comparisons to both the experience and representational products of cave exploration and surveying.

Ingold cites the story of Theseus, the Athenian hero who defeats the Minotaur of the Labyrinth of Knossos as one of the many cross-cultural examples of how mazes and labyrinths are considered powerful sites of "wayfaring in a world of the dead" (2007:53). In his *Mazes and Labyrinths: A General Account of their History and Developments*, Matthews features a sketch of the Caverns of Gortyna located in southern Crete, and which some had suggested was the actual Labyrinth of Knossos (Ingold 2007:54). The sketcher was traveler F.W. Sieber, who allegedly produced what is clearly a plan view of the cavern in 1817. Ingold, which reproduces the image, does not consider what Sieber's actual experience traversing and mapping this cavern might have been, and instead focuses on the mythical qualities of labyrinths as places where the disembodied souls of the dead roam endlessly. This emphasis leads to a gross misrepresentation of what characterizes human experience underground.

To Ingold, "whereas the living, in making their way in the world, follow the traces left by their predecessors *upon* the surface of the earth, the dead have to thread their way *through* its interstices" (2007:54). Within this stark dichotomy, the possibility of thinking about Sieber traversing the passages of Gortyna, or SVE teams exploring and surveying

the inner world of Sistema Roraima Sur, is shut out. Moreover, caverns themselves are denied their inner and variously decorated surfaces, their inner ecologies and hydrologies, and their porous connection and relation to the "outer world." To Ingold, the ghostly traveler, whom he equates to "potholers"—the British term for “caver,”

does not have the perception of walking upon solid ground, with the earth beneath his feet and the sky above, nor does he have the advantage of an all-round vision and hearing. He is not, as we would say, 'out in the open'. To the contrary, he is fully enclosed within the earth, shut up in a medium that affords movement only along its cracks and crevices, and that insulates him from sensory contact with his surroundings. Unable to see where he is going he can have no idea, when paths diverge, of which to take. [2007:54]

For those who venture underground to explore and survey, this characterization could not be farther from their experience.¹⁶ All Venezuelan speleologists I interviewed, regardless of age, education, and even, their commitment to the "scientific" enterprise of the Society, enjoyed the experience of cave exploration first and foremost, and repeatedly spoke of caves as if having personalities, as sensuous living beings. In their view, caves do not close in on them, but instead, "open up" (see also Brucker and Watson 1987).

Analyzing caver subjectivities, human geographer Sarah Cant suggests we think about caving as a form of poetics that “flux between human geographies of exploration and encounter, and physical geographies of space within rock: limestone, water and calcite” (Cant 2003:69). Further, she argues, caver accounts of their experiences, some of them expressed through poetry and sculpture, suggest “relational understandings of

¹⁶ For others, this characterization might in fact be exactly what comes to mind at the mention of a cave. That caverns can elicit such contrasting and equally powerful reactions speaks to their ambivalent and mysterious character, a topic I address more fully in Chapter 3. However, I argue that *despite* the possible reactions, an accurate description of a cave environment cannot deny its varied and often, organic, materiality.

bodies and environments that dwell on the human-ness of a subterranean physical geography” (Cant 2003:69).

In his book *The Absent Body* (1990), philosopher Drew Leder argues that “the disappearance of the body from our awareness” characterizes much of human modern experience (Cant 2003:74). Disease, however, can powerfully disrupt this condition of “unexperienceable depth” by bringing to the fore, in uncomfortable and unwanted ways, the physicality of our existence (Csordas 1994:8). There are other ways, however, that our steady state of bodily unawares can be disrupted. Building on Leder, Cant notes that the prevalence of this bodily condition (the condition of its disappearance from our awareness) is

partly because vision is often elevated above all other senses and because 'awareness' of the individual body often happens when a body 'touches' something else, but here it is not the 'whole' body that is 'aware', only the body part affected by impact. As an activity practiced (in most cases) 'away from everyday life', cave exploration is constructed as an experience which is characterized by a rediscovery of the body, a bringing of somatic awareness albeit in very specific circumstances. [2003:74]

But the world also “touches” back, and sometimes, in unpredictable ways (Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990). Caves’ sinuous volumes—filled, unexpectedly, intermittently, with sand, water, jagged or smooth rock, mud, cave organisms—surprise the human body on the move. Caves’ particular qualities, what Gibson calls “affordances,” engage all of the human senses, sometimes simultaneously (1979; Ingold 2000:166-168). And this occurs even as speleologists *map*.

That Cant’s essay on the poetics of caving focuses on caving as leisure pursuit, and makes no mention of cave surveying raises my suspicions of a tendency to deny any

activities that resemble cartographic practices their own sensuous potential.¹⁷ Cave exploration and surveying emphasizes not just an intimate engagement with place, but also among individuals and their tools as they move about and try to make sense of *where they are* and *where they have been* in the underground environment. While Ingold is correct that there is no perspective that reveals the layout of subterranean cave passages, this does not necessarily mean its visitor will get lost and die, his soul forever bound to wander in darkness (2007:56)! On the contrary, to those who willingly and even giddily venture underground, not having this previous knowledge is precisely what charges their curiosity to explore and map. To many, there is joy in this challenge. To some, even, it is the essence of life itself (Watson 1994). Thus, we must question Ingold's depiction of life as journey restricted to walking on surfaces out in the open, and even, the idea of this journey occurring along the paths of those who came before us. What about venturing off along some other route, a route that we make as we move along, not knowing, and also not really minding, where it might lead?¹⁸

¹⁷ I have already pointed to another article by Cant focusing on speleology among British caving groups (2006). While it addresses the many relevant topics relevant to the social, political, and historical dynamics of cave exploration and mapping as a field sports-science, and even, the role of place in the shaping of these "geographies," there is no consideration of the sensuous and poetic aspect of cave mapping as a central component of the experience of cave exploration and the production of speleological knowledge itself. My work, with its ethnographic emphasis on the exploration *and* mapping as integral components of the same activity, aims to bridge this gap.

¹⁸ What of the indefatigable curiosity of young children eager to climb and crawl wherever they see fit? What of their intense attraction to hidden places, those small nooks and crannies they might call their own (Bachelard 1994[1969]; Goodenough 2003)? In an effort to push an argument within his comparative anthropology of the line, these special places, these special relations to very particular kinds of places that incite curiosity and wonder, Ingold has overlooked, it seems to me, with statements such as "you only go *inside* a place to die" (2007:100), an important though easily forgotten aspect of human experience.

Besides traces and threads, Ingold proposes a third category of lines: "ghostly lines," those that in a sense are "more visionary or metaphysical," such as those we imagine as we link stars into constellations and survey lines used to link triangulation points (2007:47). Here again cave surveying requires we reconsider the explanatory power of this taxonomy. While the orientation in degrees of survey lines drawn in a sketcher's notes obtain their value from a compass reading that aligns directionality with a grid that in fact has no empirical counterpart in the real world, this orientation also roughly maps onto the *actual* traverse of explorers within a cavern's often irregular inner surfaces.

Ethnographic accounts of cave surveying and mapping question yet another one of Ingold's arguments in his comparative anthropology of the line. Beginning with the contrast between a trace, such as the continuous freehand mark we might make with a pencil on paper, and a connector, another kind of line formed by connecting the dots, a set of dichotomies again ensue (Ingold 2007:73-103). On the one hand, the trace is dynamic, such as the one made as we go on a walk, as we move along a trail, carefully noting what we find along the way as we inhabit the world. In the sketch maps we make, these traces, these journeys are not erased. They are, instead, an integral part of our representations. Many traces, at times coming together, each representing individual life trajectories, make up what Ingold calls a meshwork (2007:100). On the other hand, a connector is static, with each of the segment lines in a hurry to get from one spot to another, not caring much about what lies between. No longer taking the line along for a walk, the connector better defines the business of the navigator (as opposed to the wayfarer) who transports goods from port to port, or the traveler whisked from place to

place contained in a fast-moving vehicle that does not move "*with* time," but "*against* it" (2007:102). Connectors as ways of life, the argument goes, have become ubiquitous markers of modernity. Cartographic maps, in which places are marked by dots, are symptomatic of this condition (2007:96).

Yet, these distinctions assume a connector's dots as given. Cave surveying makes an important exception. As caving teams traverse cave passages, and the sketcher diagrams the line plot in his notebook, dots represent the survey stations that, as I have already described, result from a complex negotiation between the cavern's inner form and the group's physical capacity to make its way along. In practice, the points at which the tape leader decides to create a survey station are moments of relative rest. They also are the points at which the survey team members face each other in their coordinated effort to assess the characteristics of the passage just traversed. Did it go up? Did it go down? How long is it? What is its orientation? The segments that the sketcher draws connecting these points roughly parallel the team's actual passage through the cavern. For those who embrace an ecological ethic, the aim is to move along carefully, following along the path trail-blazed by the tape leader—to step where she has stepped, to heed her suggestion to hang the head low at a point with delicate formations glistening from the ceiling—in order to minimize the impact on the cavern. This in no way denies the deeply embodied and engaged relations among explorers and cave.

The final version of a cave map typically does not include the line plot, or, in the words of the SVE members, *la poligonal*. Instead, the lines of the final representation are those lines that emphasize the cavern's inner contours. For some scholars, this "edit" could be interpreted as a move to erase human engagements with place. For others, it

might be just another deceiving gesture aimed to suppress human practice and instead show an objective representation of the cave "as is." I suggest, however, some alternative interpretations: Could the erasure of the line plot be read as an acknowledgement that what matters in the speleological pursuit is the cave and not those that explore, survey, and at times even discover it? Could the emphasis on a caverns' inner contours as opposed to the surveyors' traces be an acknowledgement that different teams might produce slightly different line plots (with different, more, or less survey stations) and yet, at the end, result in similar approximations to the cavern's actual shape?

The views these maps confer are filled with the perils of representation that many have directed at cartographic practice. As Doreen Massey reminds us, there is the ever-present danger of seeing representation "take on aspects of *spatialisation* in the latter's action of setting things down side by side; of laying them out as a discreet simultaneity" (2005:23). Massey's concern here is the pervasive conceptualization of space and time as opposing tendencies, with representation of space understood as taking time out of space. Maps, as all representations, are selective with regards to what elements of reality they symbolically incorporate. By definition, then, maps flatten and simplify reality, often committing acts of erasure of undesirable or simply ignored elements of what is out there in the world. As such, maps are tools of power (Harley 1989; Wood 1992). Cave maps also court the perils of scientific representational practices that tout detached objectivity, their products (maps, reports) editing out undesirable elements, e.g., the "human" elements that "muddy" science but are, inevitably, part of its practice (Latour 1999). In the context of colonialism and nationalism, maps have been crucial to imagine and exercise the capacity to demarcate and appropriate land and everything contained

therein (i.e., Mignolo 2005; Burnett 2000; Winichakul 1994). They have also been viewed as critical components in the construction of imagined communities (Anderson 1991; Radcliffe and Westwood 1996).

Ironically, many of these critiques run the risk of fetishizing maps by detaching them from the very processes that produce them and the landscape in which they are produced. Viewed within this context of production, use, and landscape, the map opens up to alternative readings of our relation (both real and imagined) to place, our attempts at its representation, and of course, our analyses and understandings of these processes. Some scholars, however, have proposed these alternative readings, as they focus on the experience of explorers, cartographers, and scientists enmeshed in their cartographic endeavors. In *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado* (2000), historian of science D. Graham Burnett presents a thorough and critical history of the exploration and mapping of British Guiana, in an effort to "explain how European explorers turned areas they called terra incognita into bounded colonial territories" (2000:xii). Burnett acknowledges Paul Carter's *Road to Botany Bay* (1988) for highlighting this shift in scholarly perspective since Carter "identif[ies] the radical difference between spatial perspectives of an explorer on the one hand and those for whom exploring was done on the other" (2000:10). Carter's work helps dismantle the notion of a homogeneous imperial view, or "the whole of imperial exploration and mapping as a sweeping 'strategy' of European imperialism" and finds, instead, internal tensions and the need for a closer examination into cartographic practices (Burnett 2000:11). As becomes clear in Burnett's own work, the history of cartographic practices and representations of British Guiana require we accompany the explorer/surveyor (and

all of the tensions that slash conceals) along his engagements with the land and its people. This perspective has important consequences on how we analyze and come to understand the relation between space and history:

Explorers perceived the manifold oversights within the feigned oversight of the imperial gaze. A history that recognizes this, Carter lets on, would be a way forward in the wake of empire. Such a history would reject the 'state convention' depictions of space that made empire possible and that (he argues) are regularly recapitulated by standard imperial histories. [Burnett 2000:12]

Often lost in accounts that malign cartographic representations as tools of power, erasure, and potentially, appropriation, is that they are themselves a result of a creative and imaginative process (which does not automatically make them benign) (Cosgrove 1999). The degree to which this is so varies immensely. Cartographic techniques have become highly standardized and sophisticated, with technologies often reducing to a minimum how involved a mapmaker becomes with the object of representation. The point here is that it is worth examining what is it that cartographers are making representations of, and precisely how it is that they go about producing such representation. This emphasis does not deny the critiques leveled at maps and scientific representations (and the powerful ideologies that buttress their production and circulation), but it does help sneak back in some oft-dismissed points, such as the role of creativity and imagination in these processes, and, as in the case of caves, the limits of our vision and our technologies to grasp and order nature.

Consider the often vilified “view from above” (Pratt 1992). As Massey notes, “[n]ot all views from above are problematical—they are just another way of looking at the world” (2005:107). Indeed, views that attempt to step beyond our grounded perspective exercise our imagination, our attempt to approach, although never fully

reaching, an objective stance (Nagel 1986). “The problem only comes if you fall into thinking that that vertical distance lends you truth” (Massey 2005:107). To the caver, this vertical distance, this plan view projection, enables him to find his way, to make a better informed decision of where passages might go, of asserting where he has been. Cave maps, of course, do more, such as signaling a community of practice’s allegiance to a particular ethic of exploration and a particular perspective on space, on nature. But paying attention to the ways these maps are produced and the specific environments where this production takes places reveals a no less embodied, engaged, and collective endeavor simply because they tout some degree of objectivity, of science. In fact, many cavers emphasize the sensual aspects of their practice, and in no way see this as a threat to their cartographic and geological knowledge (Cant 2003; Watson 1994).

Conclusion

The only way to produce cave maps is to explore caverns in the first place, to figure out “where [they] go” (Watson 1994:6). This emphasis on exploration is one that cavers themselves have alluded to when describing why they do what they do. As U.S. caver (Red) Watson describes it,

[c]avers rarely have a goal beyond exploration itself. Not ‘Because it is there,’ but rather ‘To see where it goes.’ Some cavers do explore to connect caves, or to find enough depth or length to make their cave the deepest or longest, but the vast majority do not have these ambitions, and couldn’t be cavers if they did because of the very limited possibilities in the world for big connections and depth records. [1994:6]

In fact, producing maps is a goal that more and more cavers, regardless of “speleological ambitions,” have embraced as an integral part of their caving activities. After all, as cave systems become more and more complex, maps are necessary tools to “see where they

go.” Thus, exploration and cartographic practice must be understood dialectically.

Competitive sports cavers, just as speleologists, need accurate maps to show the extent of their physical feat. In their case, exploration records are based on the shared assumption that "sport records are set only through actual exploration" and that "[f]or a depth or length measure to count, a caver must have traversed it" (Chabert and Watson 1981:7). Exploring and surveying are the flip side of the same coin in the quest of defining both space and one's own relation to it. Embracing this dual commitment as one traverses cave passages also characterizes individuals' identities either as speleologists or sports cavers who are part of a larger and recognized community of practice. As will become clear in the coming chapters, mapping (and then publishing these maps) becomes fundamental in the identity of the Venezuelan Speleological Society's ambitious project of a national cave registry. No less critical in understanding this ambition, and the ability for this group to sustain its activities for over 40 years, is the sensual and collective experience of exploring the underground.

Cave maps not only are representations of a peculiar environment, but also of a social practice marked by distinct human spatial relations and technologies of perception (and the limits thereof) (Mueggler 2005:725). I have suggested that careful consideration be given to the specificities of the environment in which these activities occur, for they have direct implications on how individuals engage with each other and with the object of their inquiry. This engagement is intimately tied to the process of knowledge production and representations of space. It also has the potential of nurturing bonds of friendship as explorers trust their safety on each other as they explore and survey the underground. Moreover, as the case of the Venezuelan Speleological Society makes clear, it is

important to think of exploration and mapping dialectically, with both activities defining both caves and *la Sociedad*. Without understanding the precise conditions of the making of these maps and what they are representation of, we might drown out the social, material, and historical specificities of this practice. Lost too is the chance of a more nuanced analysis of and appreciation for the range and intensity of human lived experience in the world.

Chapter 5

Reading Cave Maps: Correspondence, Continuity, and Growth of the Speleological Cadastre of Venezuela

Knowing that I was working on my dissertation research in the Caripe area, Manuel Carrillo, a geology graduate student, asked me if I could obtain stalagmite samples for a climatological study from a small cave near Caripe.^{1,2} He could not go himself because of a recent back injury. During an SVE meeting in Caracas, he and Franco Urbani (his advisor on the project) explained what I needed to look for and the procedures for obtaining the required samples. They suggested I do this in Eduardo Röhlh Cave. The fact that it was located outside of the park, Urbani noted, would mean there would be no problem getting the work done (e.g., no need for special permits).

Manuel pulled out the SVE bulletin volume containing the cadastral entry of this cave. Its entry abbreviation is Mo. 12 (with "Mo." corresponding to Monagas state and "12" to the fact that it was the twelfth cavern in the state surveyed by the group). I learned that Francisco Pérez and Benjamín Magallanes had surveyed the cavern in 1973. I had already met Magallanes during my work in Caripe. He had worked as a Guácharo Cave guide for many years and had offered invaluable support to the speleologists in their

¹ Manuel Carrillo is a pseudonym.

² In recent years, geologists and climatologists have turned to cave stalagmites to study changing climate patterns, in a similar way that researchers study the rings of ice columns extracted from the arctic ice caps. The concern of over-sampling and improper sampling techniques has led to a concern within the international caving community.

explorations. The prospects to having Magallanes accompany me on this venture immediately sparked my interest. “Perfect ethnographic opportunity!” I thought, especially if he could recount his experience aiding SVE member Pérez as we explored the cavern together using the very map he helped create. From the entry I also learned that the cave is 263 meters, and that it also is known in the area as "Teodorito" and "The President" (SVE 1974:100-101).³

With my photocopy of Mo. 12’s cadastral entry (description and map), I headed back to Caripe. But as I soon realized, using this information to guide myself in the field, both to the cave and then *inside* of it, was no simple matter. I was able to bring Magallanes along, but he could not remember the specifics of that cavern he helped survey over 30 years ago. Time had also abated his desire to get muddy to help confirm a correspondence between the cave on paper and the one we eventually entered.

In this chapter I describe this and other attempts to read the Speleological Cadastre of Venezuela. This reading takes place both within and beyond the very caves it aims to represent and order within a particular system of knowledge. This reading takes different forms. As in my visit to (what I *think* was) Eduardo Röhl Cave, my “reading” attempts to find correspondence between the representation and place in the world. It emphasizes an understanding of humans’ engagements with place as relational, temporal, and multiple (e.g., Massey 2005). Where do the map fit in this relational approach? I argue we consider these engagements in dialectic with representations (Csordas 1994).

³ The first speleologists who explored this cavern to its end were, at the time, members of the Speleology Section of the Venezuelan Society of Natural Sciences, who, led by Eugenio de Bellard Pietri, opted to name this cave in honor of a famous Venezuelan naturalist (Eduardo Röhl). Respecting the precedent of this exploration, the SVE maintained this name in the cadastre.

This includes *both* their symbolic *and* material qualities, since representations also are things with social lives (Appadurai 1986; Keane 1997, 2003; Hull 2003:290-292). Thus, their materiality also must be considered in our analysis of human experience (Mueggler 2005a, 2005b, 2011). While the past chapters have focused on the process of producing these representations (defining survey standards, mapping in the field), here I turn to their multiple and sometimes contentious readings.

Other cases illustrate the complexities of this process of reading, such as the experience of us newer SVE members during the 2008 Alto de la Palencia expedition already mentioned in Chapter 3. I show our efforts to gather from the Cadastre the necessary information regarding previously surveyed caverns in the area we were about to visit. Reading this information in the field proved even more challenging. I consider as well ongoing efforts to pool all cadastral entries into one computerized database. The goal is to produce a country-wide map with the location of all surveyed caverns. Here again, challenges to read the cadastre emerge. These cases show how readers' capacity to read and use this registry depends not just on the validity of the representations, but on the way knowledge is ordered and the ease with which it is retrievable. In this analysis I build on the work of science studies scholars Michael Lynch and John Law, who consider parallel challenges that bird watchers face in the field (1999[1988]).⁴ As they argue with bird watchers, SVE members' challenges are not just epistemological, but also social as we strived to *become* speleologists and not mere leisure hikers or eco-tourists. Not only were our identities as members at stake in the ways we enacted speleological knowledge in the field, so was the continuity and growth of this knowledge. With continuity I mean

⁴ This work was originally published in 1988 in the journal *Human Studies*. Here I quote from the reprinted version in Biagioli 1999.

the challenges of keeping past knowledge alive by its constant use. As it turns out, having surveyed caves once and published their maps is not enough to ensure its livelihood.

With growth I mean the commitment of newer members to acquire the necessary skills to explore further, to survey new caves, and to include them, as many had done over 40 years, in the Speleological Cadastre of Venezuela.

Experience/Representation

A number of scholars have addressed contrasts between realist and constructivist perspectives in social research (e.g., Csordas 1994; Ingold 2000; Hacking 2001; Jackson 1989, 1996; Latour 1999; Ness 2011:71-72; Tibbetts 1988). While I align myself with those who privilege human experience in the world (a realist perspective), my ethnographic case takes this further with the need to consider human experience beyond the habitual, the day-to-day qualities of such experience (e.g., Bourdieu 2000[1972]; Feld and Basso 1996; Ingold 2000, 2007; Knapp and Ashmore 1999). Yet, to privilege a realist perspective does not mean rejecting constructivist points of view. Both anthropologists and human geographers have made this point. Already in 1994, even as he called for analysis of embodied practices that views humans as being-in-the-world, Thomas Csordas stressed that this does not replace anthropological focus on representations (i.e., language, texts) (1994:9-11). Instead, they should be viewed together, so long as the representational view does not drown out our capacity to acknowledge and examine the immediacy of human experience (Csordas 1994:20).

Similarly, some human geographers have cautioned against this either/or approach in what Nigel Thrift calls non-representational theories (1996).⁵

Science studies scholars also have been concerned with the realist/constructivist debate, although their focus predominantly has been on the issue of representation of scientific knowledge (Hacking 2001; Lynch 2002; Lynch and Woolgar 1990; Latour 1999; Tibbetts 1988). They have addressed, from many different angles, old philosophical questions regarding epistemology, such as how it is that we come to know what we know of the world and whether or not the knowledge (representations) we produce of the world is accurate. In contrast to philosophers, however, science studies scholars ask these questions as they analyze specific case studies (as opposed to dealing with them in the abstract) (Lynch 2002). As soon as sociologists, anthropologists, and historians began to meddle with these topics, however, strong (and often bitter) reactions ensued, particularly from scientists who saw their enterprise critiqued and attacked (and by non-specialists, no less) (Latour 1999). Even among social scientists, the debate has been fierce regarding the proper domain of sociological explanations of scientific practice.

Some propose models that explain scientific knowledge in terms of social constructions (i.e., primarily, if not exclusively, the result of actors agreeing on what this knowledge is). Others, in contrast, suggest a realist basis for such affirmations. This basis is “external” to the social vicissitudes of practitioners (Hacking 2001; Latour 1999;

⁵ Lorimer (2005) would have preferred a different term, such as “more-than-representational,” since the issue is not a rejection of representation but of broadening/shifting the conceptual and methodological toolbox to acknowledge and examine human experience as process that at least at some level might be pre-symbolic, pre-cultural (Macpherson 2010:2).

Tibbetts 1988). This is, admittedly, a schematic simplification of positions, the kind that has been referred to (and caricatured) as the Science Wars that peaked in U.S. academic circles in the 1990s (Latour 1999:15). In fact, many scholars have produced nuanced and thoughtful analyses that go beyond the trite “either you believe in reality or you don’t.”

Already in 1988, Tibbetts had argued for moving beyond these all or nothing positions. In his view,

[there is no need to commit] to either a realist or a constructivist account in a mutually exclusive sense; elements of both in fact appear in most writings on the subject. The contrast between constructivism and realism is the emphasis respectively given - or not given - to the social contingencies surrounding RDs [representational devices, such as pictures, maps, graphs] and associated evaluative criteria, and the supposed epistemic independence of the data points from such considerations. [Tibbetts 1988:118]

He dismisses the “either-or” character of the realist-constructivist debate as a “red herring,” and suggests instead we focus on the extent to which realist and constructivist elements are mutually at work and interactive in the design and utilization of RDs (representational devices) in scientific contexts" (Tibbetts 1988:119; see also Hacking 1983, 2001).

This is the perspective that Michael Lynch and John Law take in their analysis of bird watching practices (1999[1988]). I summarize their case (which goes beyond the domains of institutional scientific practice and into the field): A novice joins an expert bird-watcher for a walk around a pond. With binoculars and field notebook in hand, they try to identify as many birds as possible. The novice left her bird field guide behind, so she relies on the knowledge of her expert companion for proper identification. Soon, problems ensue. First, birds often are difficult to see clearly (and long enough) in the distance. While the expert birdwatcher may point out that the duck in the marsh is a

gadwall, the novice feels trepidation to add “gadwall” on her birding list. For, although she sees the bird, would she be able to identify it when she sees it again? Will she remember how to distinguish this bird from another? To Lynch and Law, the novice’s “problem is to get the name ‘to stick’” (Lynch and Law 1999[1988]:318). If she at least had at her fingertips (or better yet, in her head) “a compact device *collecting and contrasting species identities*” or some other form of “synthetic *table of possibilities*” listing the names of and characteristics of birds in the region, her experience may have been more productive; she would have been able to get those names to “stick” (Lynch and Law 1999[1988]:319). The closest thing to such a case is having an actual field guide with her. However, as Lynch and Law suggest, this is not without its drawbacks. Field guides can be too large and clumsy to use in the field. If one does not know what bird is out there, then how does one navigate through the index of possibilities in the book? Birds rarely pose long enough for the curious onlooker as he fumbles through pages with text and pictures. The arrangement, kind, and quality of these texts and pictures matters as well. Lynch and Law compare three guidebooks representing the schematic, photographic, and dioramic modes of picturing birds in the text. Handled in the field, each has its positives, but also its negatives.

To Lynch and Law, this bird watching episode

[b]rings into relief the way in which “experiencing the meaning of words” in a specific naturalistic domain requires an apprenticeship to a social organization of reading and writing. More generally, an examination of this game enables us to appreciate how “natural order” is discovered and organized through the use of texts. It also enables us to appreciate that “natural kinds” are not simply representations of what the eye (or mind’s eye) sees. In place of a perceptual model of observation, we suggest open-ended investigations of *situated practices of reading and writing*. [1999[1988]:319]

These practices “require an active consultation of texts as part of the embodied performance of a socially organized activity” (Lynch and Law 1999[1988]:320). A novice bird watcher might attempt to read her field guide, or, as the case the author describe, follow the guidance of her expert companion. With this information, she attempts to find correspondence between this information and what she perceives. She tries to link words and things. Lynch and Law’s open-ended investigation of this situated practice of reading and writing (in this case, annotating in the field notes the birds identified in the field) suggests that “bird-watching is not a naked matter of looking and seeing.” Instead, it is an activity that requires constant back and forth between textual sources of information (field guides), tools that aid one’s perception (binoculars), time, and patience. Moreover, “the outlines of the game differ significantly when it is played along, by groups of novices, and by groups of experts” (Lynch and Law 1999[1988]:320).

This bird-watching analysis emphasizes the “reflexive relationship between the literary phenomenon of the list and the embodied and interactional performance of observation and representation” (Lynch and Law 1999[1988]:321). The relationship between perception and the natural world resists over-simplification when examined in practice. This does not deny the reality of the natural world, nor the human capacity to perceive it and know it. However, these capacities are not automatic givens, but processes that “[depend] heavily upon the textual, interactional, and authoritative production of lists” (Lynch and Law 1999[1988]:321).

I describe this case at length because it provides productive counterpoints to the different ways of reading the speleological cadastre. First, both cases involve practices in

the field, in spaces that are less structured or controlled than the laboratory, the more classic “site” of scientific production. In both cases, these field practices are accessible to the amateur (and the ethnographer) (Kuklick and Kohler 1996). As in the case of bird identification, identifying caves in the field rests on the criteria and knowledge produced by a relatively well-defined community of practice.⁶ Again in both cases, the design and materiality of the authoritative source of knowledge (the field guide/the cadastre) critically impact the experience of putting this knowledge to use. This last point raises not only the issue of how, but of why: What is the purpose of this knowledge? I turn to this question in the conclusion.

Reading the Cave Map

The complete cadastral entry of Eduardo Röhl Cave (Mo.12) reads:

State: Monagas. *District:* Caripe.
Geographic coordinates: Long. 63° 31' 15" W; Lat. 10° 12' 43" N.
Consulted map: Sheet 7446, Cumanacoa, Dir. Cart. Nac. [National Cartography Office], Scale 1:100.000, 1° edit., year 1964.
Entrance: 1,310 a.s.l. [above sea level]
Horizontal development [total length]: 263 meters.
Vertical extent: 27 meters.
Surveyors: F. L Pérez, B. Magallanes, 12-20-1973.

Descriptive location: The cave is located south of La Guanota, taking a right at the second road split once one enters the hamlet. Then one continues walking for 1,200 meters in ESE direction.

Description: The Eduardo Röhl cave is also known by the names "Teodorito" and "The President."⁷

⁶ Although as I have already argued, this might be less so among speleologists than ornithologists.

⁷ The first speleologists who explored this cavern to its end were, at the time, members of the Speleology Section of the Venezuelan Society of Natural Sciences, who, led by Eugenio de Bellard Pietri, opted to name this cave in honor of a famous Venezuelan

It is formed by six main salons, following the general W-NE direction. The mouth of the cave, 7 m in width by 4 high, gives way to a salon with large blocks on the ground, that in turn communicates by a soft incline to a second salon, 10 m high and with a small lateral gallery along the north face.

Going up a 2 m escarpment, after a small stretch of a gallery with stagnant water, one arrives at a third salon that has various water ponds and one small bat colony.

The next salon is a very wide *laminador* [a wide gallery with a minimal height that forces the explorer to lie on the floor to traverse it], with a 55° slope and rocky walls for the most part.

To arrive to the fifth salon, the conditions are similar to the ones of the previous salon, one has to cross narrow passes. Lastly, and going up a small slope, one arrives to the 6th and last salon, the largest in the cave, with a maximum height of 15 m.

There are numerous speleothems in all salons of the cave, but in this last one finds the greatest number, with a column 3 m in diameter and some 10 m in height at the center, and one gallery some 15 m in height and 17 m in length, that one reaches going up a 4 m escarpment. At this point two descending galleries open up that communicate with a lower level where a small water current runs. The greater of the two communicates by means of an 11 m chasm that is closed off at the end with breakdown.

The cave is well known in the sector. [SVE 1974:100-101]⁸

A corresponding map accompanies the cave's description. In anticipation to how I was to use it in the field, its materiality became a matter of concern. The map is printed on an inserted 8.5 by 11 in sheet folded in half to fit the journal's format. I welcomed the manageable size, since I had to make copies of it to take to the field. Taking the actual volume would have been a bad idea. Not only would it have been more cumbersome to

naturalist (Eduardo Röhl). Respecting the precedent of this exploration, the SVE maintained this name in the cadastre.

⁸ The elements of these cadastral entries changed slightly after the 1975 meeting among Venezuelan speleological groups I describe in Chapter 3. Note for example that we have no assessment of the survey quality.

hold as I explored the cave, there are only a few early BSE bulletins available of their original 500 run from the early 1970s. It would have been a waste to take it into the cave and trash it in the process. In contrast to the bird watcher, I did not need to worry about identifying a phenomenon as one of many possibilities, a representative of its species. There only is one Eduardo Röhl Cave, as opposed to one gadwall of many of its kind. My challenge involved finding and identifying *that cave*. Thus, in my case, no need to have in my fingertips “a compact device *collecting and contrasting species identities*” or some other form of “*synthetic table of possibilities*” (Lynch and Law 1999[1988]:319). If I failed to establish correspondence between the cave represented and the one located and explored, I would have to get out and locate and explore another nearby.

The map of Eduardo Röhl Cave contains both a plan and profile view at a 3 cm = 15 m scale. Three cross-sections offer yet another perspective of distinguishing passages of the cave. Both plan and profile views contain reference points marked with letters to help the map reader find correspondence between both cave perspectives.⁹ Both cadastral maps and bird images in the bird guides that Lynch and Law analyze use a “picturing model of the RD-RO relation,” whereby the RD (representational device) “graphically resembles” the RO (represented object) (Tibbetts 1988:120). Precisely what it means to “graphically resemble” is open to many possibilities. I already have attempted to describe what the various cave map perspectives represent (see Chapter 2 and 4). I concluded that these representations involve a number of imaginative leaps that construct a perspective that is not like anything that is “immediately” perceived or experienced as one traverses the cave landscape. And yet, the lines of the map *do* attempt to trace real

⁹ See Chapters 2 and 4 for a description of these views and the perspectives of the cave they aim to represent.

forms in nature that would be perceptively evident *if* we could slice the cavern along horizontal, vertical, and perpendicular planes. Lynch and Law analyze the various “representational devices” adopted by each of the guide books they analyze. Schematic drawings of birds have the benefit of allowing artistic license to emphasize key features that will help the bird watcher identify the species in the field (Lynch and Law 1999[1988]:323-327). Drawings also ensure consistency: all birds are shown with the same pose. However, rarely are birds *seen* in the field in the ways depicted in these drawings. Other guide books opt for a more naturalistic representational device, such as photographs in the field. This gives the advantage of providing the context of the bird’s habitat (if the background of the image is not knocked out), but loses the accents and consistency that make the drawings effective (Lynch and Law 1999[1988]: 327-329).

In my experience viewing cave maps, there appears to be less diversity of representational devices when it comes to representing caves. The basic notion of the plan, profile, and cross-sectional views remain the norm, or at least the foundation, of the way caves are represented in the speleological community. Technology (and creativity) have made other “views” possible, however. Computerized images of the caves’ volumes are increasingly common, but the benefits of such a view are usually lost in print. Cave photography has been part of speleological pursuits for over 150 years, but it usually provides accents that complement the textual description of a cavern. As I have already noted, cave photography involves an arduous process that is both technical and creative. It is also time consuming. Rarely are survey teams also photographing the caves they aim to represent. However, for caves that have entrances or geological formations that are out

of the ordinary, a photograph certainly aids the process of establishing correspondence. This was not the case with Eduardo Röhlh Cave.

After receiving Carrillo and Urbani's instructions on sampling in the SVE headquarters, I studied the Eduardo Röhlh cave map. There, in the musty basement of a Caracas residential building, my immediate concern was not whether the cave corresponded to reality. That would come later. Assuming this was an accurate representation of the space I had already agreed to explore for rock samples, my issue had to do with *me*, my exploration skills, by body, in relation to the cave. Any tight "squeezes" through which I might not go through? Any black pools to wade that would suspend my body over unknown depths? Any big drops or vertical pits that would require electron ladders or climbing equipment for major rappels and ascents?¹⁰ Running my fingers along both the plan and vertical views of the cave, the answer seemed to be "no" to all of these potential hurdles. The description's assertion that "one has to cross narrow passes" from one salon to the next worried me at first. However, checking dimensions I concluded that I had endured far worse spots during my limited experience underground. Yet, I could not trust my judgment. I struggled transforming these black lines into volumes, volumes that I tried to imagine in relation to my body and its size, its strength, its skills. Whether or not I would be able to handle my fear of darkness was another matter.

The scalar—indeed, the phenomenological—relation between the bird watcher and the bird contrasts dramatically to that of explorer and cave. The bird watcher is a distant observer; the explorer an intruder in a space that contains her. The first relies

¹⁰ I describe how cave explorers utilize this equipment in Chapter 6.

primarily on vision (and sound) as the primary senses of perception engaged in the process of identification. For the second, vision is no less important (getting caught deep in a cave with no light could be disastrous). Audition may be critical when determining the proximity to an underground waterfall or river. The smell of damp sand or decomposing vegetation brought in by rain often overwhelms. Is it touch, then, that becomes the driving sense in the process of identification of caves? I suggest moving away from thinking about the senses in disembodied isolation. What is critical here is the explorer's capacity and willingness to *explore*. As I did in Chapter 4, again here I emphasize thinking of this activity as humans' (although not solely human) intentional probing of the landscape. To Tim Ingold (2000), this is an event, a process whereby "body and landscape are complementary terms: each implies the other, alternately as figure and ground" (Macpherson 2010:3). Even this description falls short of what I hope to convey. The terms used must contain *movement*. The notion of the body's "emergen[ce] through its 'interweaving' with the world" gets closer (Macpherson 2010:4; Damasio 1999; Deleuze and Guattari 1987). In this process, not only is the explorer "reading" the landscape, since "reading" primarily implies visual practice that transpires in one place. Feeling along? Too passive, too "soft." Perhaps best to embrace concepts put forth by Non-Representational Theorists, such as thinking of the "physical body and sensations [as] on the move, interconnected with other bodies and contexts [which] means our sense of embodiment is dependen-dant [sic] on how our body is put to use" (Macpherson 2010:4). What this perspective leaves out is the sense of *newness*, the sense of the *unexpected* that so profoundly characterizes traversing a cave. I am left with no better alternative than to go back to *exploration*, which captures the sense of purposeful

movement, sometimes involving great effort and risk, through an unknown space that at times *resists*. This exploration leaves imprints on both body and place (Ness 2011:83). Indeed, from repeated explorations, a cavers' body transforms: it becomes stronger, more nimble.¹¹ As much as the conscientious cave explorer is careful to tread softly, the cave environment is impacted.

If there is such a thing as a cartographic reading of “anticipated embodied experience” this had to be it. This embodied experience would not be primarily about which way to go, how to get from point A to point B, what things I would find and see along the way, or even how to orient myself and select a path in a given space. At least in this case, the cave appeared to be small enough, dispelling concerns about getting lost. Most likely, the cave's inner contours would likely determine (or at least highly delimit) my “path.” I read the representation before me as that of a space that would contain me, challenge me, surprise me, and at times even scare me. While it gave me some idea of what to expect, that was hardly reassuring.

For my first visit to Eduardo Röhlh Cave, two people accompanied me. The first was the veteran Guácharo National Park ranger Blas Salazar. Always concerned about my safety, he stressed coming along. He was the one who suggested having Benjamín Magallanes to join us.

From Magallanes's small home located in the town of San Agustín, we took a short five-minute cab ride to the small town of La Guanota. We did our best to follow the description of the location of the cave noted in the SVE bulletin, realizing that it could be

¹¹ During my training in a cave geology course in Kentucky in 2004, a woman classmate commented with pride on the bruises on her body. For her, they were signs of having enjoyed an intense caving day.

outdated. I had no GPS reader, so I could not compare satellite coordinates to those in the text.¹² Magallanes could not remember how to get to the cavern, either. As soon as we veered right off La Guanota's main road, we walked by a lush watercress plantation with men working in knee-high water collecting the crop. We asked if anyone knew where the Eduardo Röhlh Cave was. The request elicited blank stares and shrugs. "What about Cueva Teodorito o Presidente?" I asked. This time one of the men, a teenager, came towards us and offered to guide us. He said it would take 15 minutes to reach its entrance.

Encouraged, we followed him across more farm fields and up the southern hills of La Guanota's fertile valley. The path leading up to the cavern was barely visible through the vegetation. Yet, once we arrived at its mouth it was clear that people visited the place. There was graffiti and trash (plenty of soda cans and beer bottles) both in and out of the cave.

I asked Magallanes if he recognized the cavern from its entrance, but he seemed doubtful. As he explained, he had not been here for a long time, perhaps since that December day in 1973 with SVE member Francisco Pérez on that survey trip of caverns along the ridge. Perhaps he would recognize it once inside, I thought optimistically. Yet, both Salazar and Magallanes turned back as soon as the main passage required stepping through a narrow point filled with water and mud. Fortunately, our young guide offered to accompany me inside. I would not have gone in alone. Salazar and Magallanes decided to wait for us at the entrance.

¹² Even this would need to go through conversions to get at some basic correspondence, since the coordinates used to locate the cave in 1973 are based on the system used by the 1964 map, which is not the same system used by GPS. Moreover, the thick forest vegetation of the area may have made getting a satellite reading virtually impossible.

I pulled out the copy of the cave map that I carried in a plastic bag in the chest pocket of my caving overalls. I focused my headlight on it. Is the cave we are standing in and traversing the *same* cave that SVE surveyors mapped in December of 1973? Does this map represent this space I am *in*? I tried to locate a prominent feature of the inner landscape that I could see, given the range of my light. I then tried to find a match on the map. Precisely what constitutes a “prominent feature,” however, is subjective. How much detail of bulging rocks, stalagmites, and stalactites a surveyor includes in his sketchbook varies immensely. Too much detail would crowd the graphic and make the general inner contour of the cave ineligible. My effort at matching a single feature in the cave to the map was very difficult to do. So I shifted tactics. With cave map in hand, I strained my eyes, trying to make sense of the predominant inner form of the cavern. I soon resolved it would be best to go in as far as we could, and then, with a better idea of the cavern's whole, turn back and read the map from back to front. This had the advantage of shifting perspective from specific points in the space to *sensing* trajectories. As my body moved along, I could begin to feel/imagine a form coming into being. The floor slopes down, then up again. At some points, whether I focused on points or trajectories was less a matter of choice and more a matter of necessity. Where the floor sloped and the passage narrowed, I needed my hands free to hold on, push along, and through. Forget the map!

I moved along while dealing with my own anxieties about lacking the company of a caver more experienced than myself. My companion was a complete stranger. Such anxieties mixed with the physical effort of pushing along, especially through the three tighter angled passages that challenged my body: there were no hand or footholds. Here, we helped each other, holding our hands and feet to keep each other from slipping down

the steep incline... slipping down to who knows what. Soon I was drenched in sweat. The cave's passage was damp and muddy. Still, we managed to move ahead, eventually reaching what I would later know, with more certainty, to be the cave's final main gallery.

I stared at the map. If this was not the same cave, then it had to be a very similar one to the one represented on paper. As its most distinguishing features, the three tight and angled passages seemed to match. The drawing of the last final gallery included a thick stone column in the middle of the room, and there it was, next to us, as we scanned the place with our lights. I decided to turn back. I told my brave companion that it was not prudent to carry on: the cave seemed to continue along two narrower legs, much like what the map suggested, but they were not easy walking passages, their vertical distances requiring some climbing (so, according to the map, we did not descend to the second level). We also did not have much light. I brought with me the recommended three sources, but I had left one with Salazar and Magallanes, and the other I gave to my companion. As we made our way out, the cave seemed much smaller than what we encountered on our way in, a result, most likely, of familiarity, of knowing what to expect. I also paid more attention to formations. The farther one was in the cave or along the extremes of the passage, there were more formations standing, most seemed small and somewhat amorphous in shape. And of these, the best ones would not be easy to get to. What to do? I tried taking some photographs, but knew that I would have to return. At least for that day, I was content to have made it this far: locating what we believed, with guarded certainty, to be Mo. 12.

Some of the challenges I faced that day in La Guanota involved classic epistemological problem of establishing correspondence between reality and representation. Was the cave I was in the same represented in that cadastral entry? What precisely was the relation between the “RD” (representational device) and the “RO” (the represented object) (Tibbetts 1988:117)? Chapter 4 addresses the process of making cave maps. Here I focus on the process of reading the cave map, both prior to arriving at the field and then the experience of finding and traversing the cave. In my account I have pointed to the process of “reading” a representation that has both symbolic and material qualities. These qualities intertwine, in practice, with the cave’s own physicality and by own. Together, at the rhythm of my own traverse alongside my companion, a spatial cognitive and affective appreciation comes into being. I never perceive or sense the cave *in its totality*. I do so only piece meal, slowly, between shrugs and grunts as I chug along. My light only shines where I focus it, its intensity a function of the LED bulb, the battery that feeds it, the changing volumes of the cavern, and the reflective quality of the inner stone.

I could have brought a measuring tape and measured the length of the passages. This could have reduced the guesswork. Most of the passages did not allow for much room to move, so the paths I took must have been very similar to the paths the 1973 surveyors took. Their actual survey stations are not marked in the final map. These graphic clues of the itinerant quality of the map-making process have been erased from the final map. For erasures such as these, some scholars accuse the map of editing out the processes and experiences involved both in their production and reading (de Certeau 1984:121; Ingold 2007:100-103). Here’s an alternative interpretation: By not depicting

their exact survey traverse, I felt unconstrained to follow their exact path. Not that this mattered much. Again, the cavern's inner contour did not allow for much room to maneuver. As a "blank" template, the map could suggest, "Welcome, go on ahead, and discover your own cave, make your own path." Recalling the limits of exploration and representations of caves, it was not impossible that some passage may have been passed up, or even, that blocks had shifted. Regardless that others had been in that space, measured it, and sketched it, every move, every encounter was new *to me*, to my body in motion, to my mind imagining wildly, not quite sure what to expect.

Reading the Cadastre

The SVE periodically has published a listing of all of the caves featured in the cadastre. The 40th volume *Boletín* has one of these lists, with entries organized alphabetically by state and survey number. Still, locating these caverns on a map requires finding their entry in the volume where they appear, their coordinates, and transposing them on a map. This is what some of us faced as we prepared for an expedition to the region of the Alto de la Palencia of northern Monagas state in 2008 that I introduced in Chapter 3. In one of the SVE meetings leading up to the expedition, a veteran member emphasized the importance of doing our homework, of becoming well acquainted with the survey work that the SVE had previously done in the area we were about to visit. Of the eight SVE members committed to the expedition, four (Maribel Ramos, Luz Rodríguez, Juan Acosta, and myself) had never visited this region. We made a copy of a topographical map of the area produced by Cartografía Nacional (National Cartography) in the 1960s. We found it in the Society's dusty map archives. Carlos Galán, the SVE member going on the

expedition with the most experience exploring this area, used this copy to note the approximate location of limestone formations along the ridge. He also marked with a dot the location of some of the caves already explored.

While in the field, however, establishing a correspondence between the dots on our map and actual caves was a challenge. We had not written down the geographical coordinates of the already explored caverns. Only Rodríguez carried a GPS unit that may have determined whether we stood in front of the gaping mouth of an already explored cavern or not. Yet, even this technology has its limits. As a seismic geologist who routinely does fieldwork all over the country studying fault lines, Rodríguez explained to me that GPS technology is really in fashion, but often useless when hiking within heavy forested areas. "You just can't count on satellite readings," she told me (Rodríguez, Personal Communication, April 29, 2011). Several times we walked by what seemed to be tantalizing entrances in the exposed limestone, and several times those of us who were hiking this area for the first time asked whether these caves had been explored and how large they were. Yet, the general mood by those more experienced members was that *that* was knowledge that a careful study of the published data could provide. The subtext here, at least as I perceived it, was that they were not in the business of serving as guides or slowing down the pace of the expedition. As Carlos Galán emphasized at one point of the trip, "This is a speleological expedition, not a tourist excursion."

The experience of us newer SVE members in the Alto de la Palencia 2008 expedition highlighted how much individuals' capacity to read and recognize the karst landscape depends on previous speleological engagements with this landscape. Moreover, our experience revealed the effort required to translate the speleological

knowledge contained in the Speleological Cadastre of Venezuela into practical knowledge in the field. Society members had acknowledged these limitations before. In SVE meetings during my time in Caracas between 2007 and 2008, the proposal was made of creating a computer database of all caves and their locations by state, and then graphically linking this database to topographical maps of different regions of Venezuela. As Francisco Herrera stressed, this would be for the group's own members, particularly the newer ones who had no previous experience in these karst regions requiring repeat visits. Well acquainted with reading topographical and geological maps and handling and imaging geological data, Rodríguez volunteered to lead this effort. She assigned different Society members with entering into an Excel file template the data needed to plot cave locations. They have first focused on three of the states with the most cave potential beyond the many already explored and surveyed: Zulia, Falcón, and Monagas. Yet, the task has proved more complicated than originally thought. As Rodríguez explained, attempts to plot the location of caves onto maps sometimes "do not match" [caían en sitios dispares] (Rodríguez, Personal Communication, April 29, 2011). By this she meant that the cave coordinates in the cadastre do not coincide with the cave's *expected* location. She and long-time SVE member Franco Urbani, also a geologist, believe that perhaps there were errors in the data entry, or perhaps the explorers based the calculations on outdated maps.

How could they tell that the coordinates did not match with the actual cave location? Doesn't this require being *in the field*, standing at the cave entrance in question? Recalling Rodríguez's explanation about the limits of GPS technology, how else could cavers establish a correspondence between presumed geological phenomena

based on written reports and the phenomena themselves? She began by describing the case in the field: "Actually, the best way to locate yourself [in the field] is to read a good topographic map together with a good geological map," she explained (Rodríguez, Personal Communication, April 29, 2011). Knowing the location of rivers, particularly where they emerge from or submerge into the ground, is useful information that a topographical map provides. Geological maps, such as those produced by Standard Oil's subsidiary company Creole in Venezuela in the 1950s, note the location and extent of exposed limestone, the soluble rock with the greatest cave potential.¹³ Even when not in the field, as Rodríguez and Urbani tried to "place" caves on a map based on coordinates, they relied on both topographical and geological maps to determine if such numerical location made geological sense. If coordinates placed a cavern far from a limestone outcrop that contains other caverns, they suspected an error. The only way to correct such a mistake would be to return to the field, locate the cave using as many reliable clues (other than the coordinates) as possible, and reenter the correct data. This would be an arduous task, and, as I expressed it to Rodríguez, it puts into question the accuracy of the entire cadastre.

The urgency of this project has grown as more experienced cavers have left the group and new ones have joined. Newer members yearn to make speleological knowledge more accessible and practicable while in the field. Doing so would enable them to make both the karst landscape, *and the cumulative project of over 4 decades of speleological pursuits*, more legible. Such urgency speaks to the concern with continuity

¹³ During his tenure as a geology professor in the Universidad Central de Venezuela, Franco Urbani scanned all of the Creole maps and has made them available to many of the country's geologists.

and growth both of the cadastre and the Society. The idea of what speleological knowledge is *for* is tied to these concerns as well. The belief that such knowledge has use and value beyond the limited confines of speleology might support efforts to popularize both the project and its content. One potential downfall here is that such popularization might lead to cavern's destruction. Another is that it might tip off competing exploration groups of potential new discoveries. This actually is a contentious issue in many speleological communities around the world (I return to this topic in Chapter 7).

I suspect that in the case of the SVE, the idea of popularizing speleological knowledge beyond the confines of speleological scientific practice might be associated with the vulgarization of this practice. Recalling my argument in Chapters 2 and 3, where I describe the group's general embrace of an ethical stance against both geological and personal monumentality, it is probable that the idea of popularizing speleological knowledge could be seen as a form of self-aggrandizement.¹⁴ Let us recall here my contrast among the speleological identities and contributions of Charles Brewer and Eugenio de Bellard. Despite the claim that Brewer and de Bellard popularized their explorations in non-scientific publications, their efforts also have (and in the case of Brewer) continue to reach a broader audience. In contrast, the SVE publications have limited circulation. In Venezuela they are scattered, often missing many volumes, in academic libraries and the personal bookshelves of its members. So used to this internet age, it seemed preposterous to me that this material not be accessible on the web, specially since that kind of accessibility could also raise the Society's profile among other

¹⁴ I suggest this point with trepidation. A closer look at specific moments and events in the group's history counters this evaluation. I return to this point in Chapter 7, where I describe the group's relation with the state.

international speleological groups. The idea had come up before, SVE member Francisco Herrera told me, but it was dropped given the concern that such easy access on the internet of the bulletins' content, particularly the cave maps, could easily be appropriated by some other group that could just copy them and put their name on them. "If somebody really wants to learn about Venezuelan caves, they can come here [to the SVE premises], or visit libraries that contain the *Boletín*" (Herrera, Personal Communication, 2008).¹⁵

One person who has been doing just that is José "Capino" Díaz, a graduate of the geology program of the Central University of Venezuela. Having Franco Urbani as one of his professors encouraged him to pursue speleology. He did so as member of his university's caving club, the CEIC (Centro de Exploraciones e Investigaciones de Campo). During my time in Caracas I witnessed friendly relations between this group and the SVE. Twice they collaborated in technical rope practice sessions, once in a cave in the outskirts of Caracas and another at an abandoned cable car tower on Avila mountain which flanks Caracas to the north (a perfect place to practice rope techniques such as ascents and rappels). Several times CEIC members attended SVE meetings. Sometimes they would bring drafts of their cave maps to get feedback. The group has contributed to the Speleological Cadastre of Venezuela.

Along side his geological and speleological interests, Díaz has created an eco-tourism company. He takes tourists (typically young Venezuelans) on one-day trips to caves nearby Caracas. The Alfredo Jahn Cave, two hours east of Caracas, is a popular destination. In the 1950s, members of the Speleology Section explored this cave of

¹⁵ As of this writing (January 2012), the Society again has a website that does feature the electronic version of some of its most recent publications, but they do not include cadastral entries, much less a search engine of caves. See <http://www.sve-espeleologia.org.ve>.

relatively easy access. The SVE finally published its map in 1973 (SVE 1973).¹⁶ The cavern is not gated, and is within the Avila National Park. Thus it is accessible to anyone. In a 2007 visit to the cavern with friends (two SVE members and their families among them), we found a sign near the entrance that Díaz had produced. It was tastefully made out of wood. It encouraged visitors to keep the area clean, and to respect the cavern by not trashing it, marking graffiti, or destroying its formations. This was not an anonymous gesture. Díaz “signed” the text with his name. No mention of this tourism company is made, however. Regardless, to the SVE member next to me, this was a blatant case of self-promotion. While I did not push the topic further, I suspect he would look down at Díaz or anyone else’s use of speleological knowledge for personal gains. Not everyone would agree. Franco Urbani welcomes Díaz’s use of the Speleological Cadastre of Venezuela to locate potential tour destinations. “This helps keep this information alive. If we don’t use it, we lose it” (Urbani, Personal Communication, October 21, 2011).

Conclusion

Unlike the case of bird watching guidebooks, the purpose of the Speleological Cadastre of Venezuela has been a topic of debate within the SVE’s history. This debate is

¹⁶ Alfredo Jahn is a fun cave. My father took my brothers and I there when we were children several times. The cavern’s inner river makes its exploration a wet affair, but the water is warm, and so are most days of the year in this region of the country. So long as basic precautions are followed, Alfredo Jahn is a wonderful place to introduce children to cave exploration. In the 1980s, my father created a children’s nature camp that included fieldtrips to this cavern. The business venture did not last long, but people’s memories of the experience remain. More recently however, concerns with crime in the area have dissuaded such trips. A family friend had his car and all personal possessions stolen near the entrance of the cavern by gunpoint. For this reason, my father was adamantly opposed to my return visit to Alfredo Jahn with a group of friends (some SVE members among them) in 2007.

implicated in the materiality and organization of the knowledge itself. Different attempts to access this information and read its content point to this fact. As I describe more fully in Chapter 7, debates regarding the purpose of speleological knowledge also take on a territorial hue, particularly when it comes to foreign caving groups visiting the country to carry out explorations. Here my focus has been on attempts to read the cadastre and the maps it contains both within and beyond the caves they describe and represent. Those doing the “reading” are primarily individuals committed to the SVE speleological project, most of us recent (and less experienced) members of the group. As I have described, our “inexperience” represented a number of problems regarding the “use” of speleological knowledge. I mean “use” both in its more abstract (what is this knowledge *for*?) and material (*how* do we take this information and use it in the field?) senses. And again, the cases I consider illustrate the dialectic among speleological knowledge, sociality, and landscape. In the case of the Eduardo Röhl Cave, which I visited with the aim of collecting samples for a climatological study by an SVE member, reading the map involved the epistemological challenge of correspondence. Had I explored the cave represented on paper? Yes, but precisely how I got to that conclusion involved a complex process whereby my twitching muscles, beating heart, strained eyes, and anxious mind *explored* the inner contours of caves. I did not do this alone. Without the kind and accidental companion who joined me that day, I would not have ventured more than a few feet beyond the cavern’s low entrance.¹⁷

¹⁷ I returned to Eduardo Röhl Cave after that first visit. The second time I was with two experienced Australian cavers whom I had met at an international speleological congress in 2005. I was able to arrange for their visit of the non-touristic sector of Guácharo Cave. In return for my favor, they agreed to help me determine the feasibility of sampling stalagmites in Eduardo Röhl. We took photographs of some of the more promising

There are many more ways in which the cadastre, and cave maps more generally, are read. These readings concern less the problem of correspondence and more their qualities as meaningful objects beyond (or alongside) their qualities as objects of science. Recall my concern with taking the original SVE volume containing the Eduardo Röhl cave map to the cave. I noted the risk of trashing the volume, citing the fact that its original run was limited to only a few hundred. When Francisco Herrera helped me collect all 40 volumes of the *Boletín* for my research, he stressed how some numbers were close to extinction and thus jealously guarded and kept in locked storage in the SVE premises. I knew I was being granted a privilege, the privilege to *own* the *complete* material instantiation of over 40 years of speleological practice.

Prior to my fieldwork in Venezuela, I often scoured my father's home library for speleological data. I would borrow his copies of the *Boletín*, but I always did so with care, making sure I returned them to their proper place. During my time in Venezuela, when I went to people's homes to interview them, they would treat their volumes with care, and sometimes speak of them with pride, even tenderness. Throughout the years, these irreplaceable volumes have become embodiments of memories of past expeditions with friends, of extraordinary and varied cave landscapes explored. They have become objects of love. I believe this quality does not apply to any one volume in particular, but

formations, although they argued that none seemed ideal for the research purpose as they understood it. I passed along the photographs to Carrillo, but the issue was never followed up. I was relieved. Soon after our initial meeting, it began to dawn on me what I had just so casually volunteered for. I was to visit a cavern near Guácharo Cave and retrieve cave formations. All of the sudden, the image of me walking through town with caver overalls and three broken stalagmites for a science project hit me as ludicrous, even dangerous in terms of what local Caripenses might think the true motives of my project were.

to all of them *together*, stacked side by side. In this way, they emphasize the collective enterprise of *la Sociedad*, a collective enterprise with a history that to some spans most of their lives. This was most evident to me when Francisco Herrera pointed to his complete volumes in his personal library and said, “When I see them... I cannot let this end” (Herrera, Personal Communication, 2008). In this “reading” of the cadastre, their very materiality, spanning over 40 volumes, embodies not just their past, but also, the possibility of their future.

I turn to one last example of an alternative reading of cave maps. In Chapter 2 I already introduce Beatriz, Eugenio de Bellard’s daughter. During our many conversations together in Caripe, she spoke passionately about her father, highlighting his many achievements not just in speleology but other sciences, law, and public service. In part her decision to move to Caripe was about carrying on her father’s dream: making Guácharo Cave a UNESCO site.

A daughter wildly enamored with her father had just met yet another. Our paths crossed, each of us in our own way retracing the paths of our fathers, two men, who in turn, had known each other through my godfather, Juan Antonio Tronchoni. Tronchoni and de Bellard had been best friends for many years. They had, together, fed their passion for caves, and had, eventually, parted ways. Always with Beatriz I was cautious with my words, cautious about extolling my “speleological allegiances” which, in her view, rivaled and even denigrated her father. I attempted objectivity as I asked countless questions, obsessively attempting to reconstruct her father’s relation to caves, this Guácharo Cave where so many stories have coalesced.

But stories coalesce and gain meanings not just in space, but in and with its representations. In April of 2007, on one of my visits to Caripe, I took de Bellard's old friend, Ramón Hernández, with me. One evening in Beatriz's home, I pulled out a copy of the Guácharo Cave map that the Venezuelan Speleological Society had published in its 40th anniversary commemorative issue (Fig. 2.8). This map was a plan view of the cave, including both of its touristic and non-touristic sectors. The image based on a computerized vector file version of the original maps published in 1968 and 1971 (SVE 1968, 1971). I placed on Beatriz's table after dinner, eager to prompt stories of exploration and to *place them* in the space represented on paper.

With pencil in hand, Hernández sketched in by memory the two galleries that he knew existed but were not graphically depicted. These were the *Salón Agustín Codazzi* and the *Galería Negra* that members of the Speleology Section discovered and explored in 1961. Hernández had been part of their first exploration. Hernández's edit did not dispute the accuracy of the map, however. In fact, he recalled being part of the discussions that led to wanting to block the entrance of these two rooms because they were considered extremely delicate, beautiful, and even dangerous.

Beatriz brought out a box of old photographs, as well as some of her father's survey notebooks. She carefully unfolded a working draft of her father's Guácharo Cave map. Like the SVE graphic, it projected the top-down, or plan view, of the cave. Beyond what appeared to be the cave's Humboldt Gallery, the main passage coiled like a nautilus, a shape and orientation radically different from the one represented in the SVE map. "It is a perfect shape! I do not know which map to trust," Beatriz exclaimed.

Checking which map was more accurate would not have been very difficult. Although she had been in the non-touristic sector of the cave many times, however, she had no cave surveying skills. In fact, all that would have been necessary to dispel the authority of any one representation was a compass. Admittedly, despite having gained some basic cave surveying skills myself, I did not put them to use at Guácharo Cave. I *trusted* the SVE map as the most accurate representation. Our conversation that evening, however, was less about the veracity of the representations before us than of the competing allegiances we each had invested in each of these images: my father, my godfather, their *Sociedad*... versus her father, his speleological ambitions of finishing what Humboldt had started, stunted, scooped.¹⁸ Interestingly, Hernández, despite having been a close friend of de Bellard until his death in 2000, sided with this SVE effort, which included his own labor, properly credited in the pages of the *Boletín de la Sociedad Venezolana de Espeleología*. But there is more. To focus here on these maps as representations alone misses each of our emotional investments in these objects and ignores their power in our own constructed relatedness to that space that they—accurately or not—claim to represent. Particularly for Beatriz, to hold, unfold, and carefully trace her finger on that working draft was the closest she had to touching her father's muddied and sweaty hands as he steadied himself in the irregular cave passage and attempted, as best he knew how, to survey that space he adored. A map, yes, but also a relic, a heirloom, an object of love.

¹⁸ When one survey party picks up the cave exploration of a cavern that had already been started by another party, without this first group's knowledge or consent, this group has been "scooped."

Hernández also had been an enthusiastic cave photographer. With other members of the Speleology Section, such as Danny Adler and Carlos Tinoco, Hernández experimented with different bulbs to produce powerful enough flashes to light dark passages. Carefully picking up cues from cave pictures of speleological publications from Europe and the United States, they creatively played with the position of their flashes to create intriguing contrasts of light and dark so as to capture the cavernous shapes, volumes, and depths. Hernández did not limit himself to these carefully composed images. He was an avid photo-journalist, both within and beyond caves. He kept well organized photo albums and slide boxes in his small room in a Caracas catholic school that had been his home for over years. One of his favorite photographic tools was a stereoscopic camera that produced three-dimensional pictures. With it he took a picture of Eugenio de Bellard with his daughter Beatriz in Guácharo Cave in 1984 (Fig. 5.1). Beatriz could barely contain her excitement when she saw this picture through Hernández's stereoscope. "Oh, my God!" she gasped, "This is the only picture of me with my father where he is hugging me!" In the photograph, Beatriz, a smiling high-schooler, stood next to her father, his arm wrapping her shoulders. This image does not exhibit any play with shadow to highlight the cave. Rather, the flash was fired directly at its human subjects, the surrounding cave formations draping around them, glittering.

Chapter 6

Encounters with/in the Cave Frontier: Speleology as Boundary Practice

To the Chaima who have made the mountains of the greater Caripe region their home, the area's rugged terrain and relative inaccessibility have been a haven. In these mountains their ancestors found refuge from the violent incursions of Spanish conquistadors, Catholic missionaries, and landowners seeking potential Christian converts and cheap labor (de Civrieux 1998:40-73). However, this relocation denied them access to their culture's most sacred site, Guácharo Cave. Fortunately, the spirits of nature are generous: these mountains are peppered with caverns, all of them housing sizeable guácharo colonies. In their quest to locate these caves and hunt their prized nocturnal dweller, many Chaima have become expert trekkers and explorers themselves (Galán 1981, 1991).

This same region also has been a key stage where the Venezuelan Speleological Society has enacted a particular ethic of exploration. This ethic challenges persistent threats to its identity as a scientific, volunteer-based, and non-profit organization.¹ I have already pointed to the group's rejection of geological and personal monumentality. It has done so with its promotion of a collective project whereby caves, all caves, gain value as part of a national registry. Here I examine the group's efforts to challenge two stereotypes. The first is that of wealthy urbanites engaged in ecotourism, seeking some

¹ These "threats" are not so much external to the group as they are part of the group's own constant need to define its identity and guard its boundaries to *itself*.

brand of adventure in “pristine” nature (Vivanco and Gordon 2006). The second regards the trope of the imperial white/European/Europeanized naturalist who exploits local labor and knowledge in quest for knowledge or resources. The Society’s relationships with the greater Caripe cave landscape and its indigenous inhabitants offers a glimpse of how the group has coped with these stereotypes. The dynamics, both real and imagined, of these relationships are the focus of this chapter.

These stereotypes stem, in part, from speleology’s dual quality as a “sporting-science” that I introduce in Chapter 1. E. A. Martel, who popularized speleology in Europe and beyond in the late 1800s, hoped that its adventurous quality would lure mountaineers by presenting the underground world as a pristine environment awaiting discovery (Chabert and Watson 1981; Shaw 1979). But Martel, who had not formally trained as a scientist, also aimed to appeal to the established scientific community. Although member of the Paris Geographical Society, his efforts to secure speleology’s place within French geological research did not succeed (Schut 2006). His 1895 presentation in the Sixth International Geographical Congress also went largely unnoticed (Cant 2006:775-776). Even today, speleology remains a marginal science, rarely featured as an established sub-discipline couched within geology departments in universities worldwide.

In contrast, Martel’s speleology caught on spectacularly among outdoor enthusiasts. Among them were academic scientists as well, mostly from fields such as geology, biology, and archaeology. Martel’s dedication to speleological societies and journals provided an organizational template that many, including the Venezuelan Speleological Society, aimed to follow. More importantly, his many publications about

his expeditions, speleological knowledge, and technique promoted a common purpose and language (Shaw 1979:385). Key here was the belief (and commitment) that *anyone* could do science. The cave landscape made this possible.

In this chapter I examine this sporting-science duality as it plays out at different points of the SVE's history. To Sarah Cant, speleology's dual character contributed to the breakup of the British Speleological Association in the 1930s since it pointed to irreconcilable differences between the scientists and non-scientists (2006). In contrast to her case, however, I offer descriptive accounts of how this presumed duality plays out in the field. I suggest that in practice, speleology's sporting-science quality has the capacity to unite as much as to divide. Again, it is critical to appreciate the dialectic between sociality and landscape prior to assuming the ubiquity and effects of this (or any other dichotomy). With caves, I suggest, we are dealing with a particular kind of landscape whose exploration, mapping, and study involves a group effort whose success is premised on a variety of skills and expertise. The previous chapters have emphasized these qualities of practice. I again turn to them here, this time moving beyond the cave itself to include the broader karst landscape. In Chapter 3 I argued we think about the cave map and registry as boundary objects. Here I consider thinking about the cave landscape as a boundary space whose exploration has the potential to bring diverse actors together in a common task, a common experience. This examination also aims to temper the "scientific" bias in my own analysis by attending more to the "sporting" side of human engagements with/in the landscape. A focus on mountaineering offers a contrast to the caving case.

Also in contrast to Cant's case, my exploration involves a drastically different historical and cultural context of practice. Part of this "context" is the other key source of the stereotypes members of the Society aim to dispel. Both for the Venezuelan speleologists and the social scientist studying their practice, the trope of the imperial explorer is impossible to dismiss. In this chapter I examine some ways in which cavers have attempted to dispel and subvert the imperial eurocentrism of speleology. I focus on the SVE's engagement with a specific karst region, that of the greater Caripe Valley, and its inhabitants, several of them of Chaima descent. This "engagement" takes three forms: First, it includes the specific relationships that SVE members have established with particular inhabitants of these mountains throughout the years. These relationships include field practices (hiking, setting up camp, sharing food), but also how the cavers have chosen to address them in their speleological publications and in recent interviews. Thus, caver published representations and stated interpretations of these relationships are the second form that my evidence takes in my argument. Third, I analyze specific events that transpired during two expeditions to the Monagas karst, one in 2002 and the other in 2008.

Scholarly attention to "cultural encounters" frames this discussion. In particular, I contrast the SVE-baquiano relations to other encounters in the field: Venezuelan elites and indigenous and mestizo workers in a famed 1951 expedition to the Orinoco River headwaters (Reig 2006/2007) and international mountaineers and their Sherpa porters in the Nepalese Himalayas (Ortner 1999).

There is a glaring deficit in this chapter, and that is the voice of these individual Chaima men. In the case of the specific relationships I address in the first part of the

chapter, by 2008 the Chaima men it features had already died or moved from the region. My plan for a more rigorous ethnography in existing Chaima mountain communities, a necessary preamble to conversations with Chaima *baquianos*, remains pending.² I acknowledge the limits and pretensions to capture “the voice of the subaltern” (Spivak 1988). Still, there is no excuse for not trying. I thus cautiously embrace the risk of perpetuating and even romanticizing the views of predominantly white urbanite males as they encounter “the Other” in Venezuela’s “nature.”

In the case of speleological practice, forging speleological identities also is a deeply embodied process. Actors are intensely and constantly aware of their physical capabilities, dispositions, and skills in relation to the broader cave, or karst, landscape. They depend on these capabilities, dispositions, and skills as they make their way to, into, and then back out of the caves they explore and survey. In the context of the SVE’s collective enterprise, this process also is performative—not to an audience as in the case of spectator sports—but to other members of a team upon which the speleological enterprise depends (Dyck and Archetti 2003). As in the previous chapters, the current analyses strive to keep in the forefront the particular dynamics of human engagements with the landscape. Scientific practice in the field results in particular forms of sociality that, in turn, shape science, the landscape, and the individual and collective subjectivities.

² The term *baquiano* refers to a local guide whose knowledge of the landscape and its ecology derives from his lifestyle’s deep involvement in his environment. During my research I heard the term used in two particular settings. The first was among SVE members referring to these men whose knowledge they depend on to find the cave entrances (I never heard of a female *baquiana*). In this case there is always a sense of respect for local knowledge, testament to a living Chaima tradition. The second was among Guácharo Cave guides to whom *baquiano* typically referred to a less educated and untrained guide, often providing tourists with misinformation. I examine the case of Guácharo Cave guides in Pérez and Galindo 2009.

Exploring the Karst of Northern Monagas: From Contact to Engagement

The knowledge of expert mountain trekkers of Chaima descent has been fundamental to the success of SVE explorations to the caves of northern Monagas state since the late 1960s. Not only have these baquianos guided speleologists to the caves located within this very thickly forested mountain region, they also have carried equipment, built shelters, and even provided a warm meal late in the night as the explorers emerged from hours of work in a cavern. In SVE lore, the relationships established with these men intermingle with the experience and significance of the landscape. In a 1991 article on the karst of northern Monagas, SVE member Carlos Galán writes:

The area of Mata de Mango ... holds for us much more than a simple listing of cold facts about a group of caves. It is a formidable region and, to speak of it would require much more space. Regardless, we would like to make at least some reference to the "environment" in which explorations have taken place and the impressions [of the region] made upon its explorers. [Galán 1991:1]

German naturalist Anton Göering, who traveled extensively through Venezuela between 1867 and 1874, carried out the first documented visit of the caves of this region (Briceño Monzón 2005; Galán 1991). The trip took him seven days from the town of Caripe, by mule and by foot. Chaimas were his guides. Göering did not explore inside caves but produced watercolors of their entrances. Members of the Speleology Section of the Venezuelan Society of Natural Sciences visited the area in the early 1960s. Member Julio Lescarbourea was the first to reach the region of Los Gonzales and lead the first exploration of the cave by that name, but lack of proper equipment to access its vertical pits impeded much progress (SVE 1982).

This "environment" is also unknown, at least to most: "Mata de Mango or Caves Ridge are names that do not figure in on maps," Galán notes (1991:1). The ruggedness of the region forms tight valleys with abrupt changes in altitude within only a few hundred meters. There is limited geological information on the area, most of its topography estimated by photographic overview from the air. The extraordinary density of vegetation makes accurate geological readings difficult even *on the ground*.³ It is by exploring and surveying caves and reading them as internal geological blueprints that the SVE has constructed an overall "picture" of the region that includes both surface and subsurface features (not just caves but also their hydrological affinities to the many rivers that traverse the landscape). Finally, Galán characterizes this "environment" as one having demanding caves to explore. Not only do most require 3 days of strenuous hiking to get to them, "most caves are important *simas* or vertical pits with active sumps of epigean rivers" (1991:1). Almost constant rain ensures large water volumes of internal cave rivers, their levels increasing with little warning and making their exploration treacherous. Even when entry into a cave is possible, the chances of having to wade or even swim good stretches are high. Becoming involved in technical rope techniques, such as those that rock climbers use, to descend and ascend cave pits, often gushing with their internal rivers, is the norm in Mata de Mango. This translates into heavy cargo to and from caves, particularly when the ropes are wet. On the return hikes, they always are.

But as Galán notes, there is much more to this "formidable" region than challenging speleological research (1991:1). Galán expresses deep gratitude to Domingo Maita, José Zapata, Pascual Roque, Felix Morocoima, among others, men of Chaima

³ See Chapter 5.

descent who guided SVE expeditions to these caves. Navigation within the jungle alone would have been extremely difficult without the knowledge and skills of these expert guides who had traveled the mountains during hunting missions, many leading caves in search of oilbirds. As Galán claims, and other SVE members familiar with this region underscore, the relationships with Chaima baquianos have involved mutual respect born out of the dedicated effort and shared joy of exploration and discovery. This

shared passion for the underground landscape and the challenges involved in traversing them have united *baquianos* and speleologists in fraternal camaraderie ... the achievements of one group could not be understood without the cooperation of the other. For this reason, we do not want to end these lines without expressing our most sincere recognition of the labor of these men who have accompanied SVE members during all of their expeditions to this region. [Galán 1991:2]

Cultural Encounters, Revisited

There are many reasons to be suspicious of these claims. The more common arrangement of these kinds of encounters involves dramatic power differentials between the “Explorer” and the so-called native, where the first exploits the second for his labor, knowledge, and resources. At the end of the affair, it is the “Explorer” who writes history, erasing the contribution of those without whom the whole enterprise would have been a total failure (Pratt 1992; Short 2009). This is the case of the French-Venezuelan Headwaters Expedition of 1951. As Venezuelan anthropologist Alejandro Reig notes, the purported main goal of this 1951 excursion was to locate the origins and survey the course of the Orinoco River (2006/2007). The entire enterprise depended on the labor and knowledge of 50 indigenous and mestizo workers whose critical participation was silenced in official accounts. According to the personal accounts of 15 of these surviving

men, their work, which involved carrying all of the food and equipment, clearing the vegetation for the party, tolerating verbal and physical abuse, was never properly remunerated (Reig 2006/2007:58, 61).

In some ways an SVE expedition to Mata de Mango resembles the Headwaters Expedition. Both cases feature predominantly white creole men, many of very recent European descent (if not actually European by birth), traveling to rural Venezuela to explore and survey “nature,” counting on the labor and knowledge of indigenous guides. Indeed, Reig’s analysis focuses attention on “the relation between the native peoples of Amazonas and the ruling elite of Venezuelans, traditionally coming from the center of the country, which has defined its political administration and the destiny of the territory and its inhabitants” (2006/2007:63). Venezuelan speleology echoes this arrangement. Despite the social and economic diversity of its members that I have emphasized in previous chapters, the SVE can be considered an elite organization. By elite I do not mean that these members have been part of an exclusive and wealthy social class, as was the case for the Speleology Section of the Venezuelan Society of Natural Sciences. The SVE founders wholeheartedly rejected participation and recognition based on that kind of exclusivity. I consider the SVE an elite organization based on the fact that over half of its membership has been university-educated, and of that group, several received higher degrees either in Europe or the United States. As I have described, these academics participated in explorations along side construction workers, mechanics and engineers, insurance agents, bankers, and even the occasional social misfit, but the core of the group’s identity was forged and has been sustained primarily by members of a small educational and cultural elite. Moreover, virtually all of them are from Caracas, the

country's capital, also the place where the group has its home and coordinates its activities.

I also have suggested that speleological practice, which takes place in a very peculiar kind of landscape, engenders a distinct kind of sociality that echoes the group's commitment to a collective and non-hierarchical brand of civic science. I propose something similar is at play when it comes to the kinds of relations that SVE members have forged with a number of indigenous baquianos of northern Monagas. Attention to the specific practices that go on in the field open up a number of interpretative alternatives to speleological encounters between white, predominantly European(ized) elites and a presumed "Other." On this count I build on recent (and not so recent) work that reexamines and even questions the "cultural encounter" trope that has received so much critical attention.

The study of cultural change has been one of the key concerns of anthropological research. In efforts that gained strength in the 1970s and 1980s, scholars sought to move away from two problematic assumptions (Coronil 1996; Ortner 1984; Sahlins 1985). The first regarded linear paradigms that assumed unidirectional forces of cultural change (Coronil 1995; Mintz 1985; Ortiz 2001[1940]). The second involved the treatment of indigenous communities as isolated and somehow frozen in history (Ortner 1984; Sahlins 1985; Wolf 1982). A more historically grounded and critically motivated anthropology sought to address the colonial and postcolonial condition that went beyond the formal workings of empire (Stoler 1991). A number of scholars turned a renewed focus on the dynamics of contact, of cultural encounter, as a way to escape the structural determinisms of large-scale frameworks such as dependency theory (Scaramelli and Tarble 2005:136-

138). This trend “emphasizes the intertwining and mutual production of the histories of the West and the Rest” (Ortner 1999:17). Such efforts have included, for example, interest in the role of material culture to the focus of the body as a contested site where sentiments, politics, and power, come together (e.g., Appadurai 1986; Mintz 1985; Mueggler 2005a; Ortner 1984; Scaramelli 1986 and Tarble 2005:138; Stoler 1991). Some have looked more closely at the terms of the relationships forged during encounters to suggest more nuanced dynamics that question, at least to a point, the paradigm of the oppressor and the oppressed. Even in the case of the 1951 Headwaters Expedition, Reig highlights the role of the indigenous and mestizo workers’ own performance in the structuring of “symbolic and material – territorial – orders” that the Expedition brought about (2006/2007:66). For my present analysis, I draw particular attention to three works that investigate the embodied and emplaced qualities of culture contact.

In his book *Out of our Minds: Reason and Madness in the Exploration of Central Africa* (2000), anthropologist Johannes Fabian reviews a broad selection of travelogues written by Europeans who traveled to central Africa between 1885 and 1910. In these narratives, he reveals a pattern in the descriptions of encounters between Europeans and natives that challenge the myth of the heroics of exploration: “European travelers seldom met their hosts in a state we would expect of scientific explorers: clear-minded and self-controlled. More often than not, they were ‘out of their minds’ with extreme fatigue, fear, delusions of grandeur, and feelings ranging from anger to contempt” (2000:3). The “ecstatic condition” includes not only “the effects of alcohol, drugs, illness, sex, brutality, and terror,” but also “the role of conviviality, friendship, play, and performance” (2000:9). In other words, Fabian highlights what has been edited out of official imperial

story: that the conditions that have produced encounters with and knowledge of the Other have been anything but rational and disciplined. Indeed, without the “ecstatic,” potential “participants” of these encounters may have never been able to “transcend their psychological and social boundaries” (2000:8-9). I suggest thinking of the role of place in differently positioned actors’ capacity to achieve such transcendence. More specifically, could there be something about the experience of/in place that leads to the ecstatic that Fabian considers a key precondition for knowledge in events of encounter?

I also rely on anthropologist Sherry Ortner’s study of Himalayan mountaineering culture as a productive counterpoint to my examination of speleologist-baquiano relations in the Venezuelan karst (1999). Her approach also focuses on the history of encounter between two groups that have confronted, in different ways and with different degrees of success, the inherent asymmetries of power in their relations: the international mountaineers and the indigenous Sherpas who sold their labor as porters (Ortner 1999:17). Their encounter is considered within the broader context of capitalist expansion, including the rise of adventure tourism and travel that radically transformed the Nepalese social and material landscape. Ortner’s story emphasizes the Sherpa community’s own transformations, both on and off the mountains, in relation to these changes. I draw from her careful attention to expedition dynamics, both in terms of material practices and ideologies, to contrast and contextualize Venezuelan speleological practice. While my analysis does not benefit from in-depth ethnography and interviews on the Chaima side of the relation, it does provide the ethnographic insight that only participant-observation can provide in the development of these expeditions on the ground.

SVE-Baquiano Relations Remembered

From the 7th to the 11th of November 1977, a small SVE team attempted yet again to complete the exploration and survey of the demanding Bastimento 1 Cave. High waters inside the predominantly vertical cave had kept others from reaching its purported end in the past. My father, Wilmer Pérez, along with Juan Enrech and Carlos Bosque, made up the 1977 SVE team. They were led to the cave by Chaima baquiano José Zapata. Pérez's field notes describe high waters yet again, despite it being the dry season. He knew that the complete exploration and survey of Bastimento 1 would require doses of physical strength, skill, and determination that were quickly becoming standard practice in the Mata de Mango karst. Bastimento 1 turned out to have numerous challenging vertical steps, ranging from 3 to 11 meters in height. Climbing ropes were required. At the first challenging vertical pit, Bosque decided to stay behind. Pérez and Enrech continued the cave survey as they struggled with its many inner waterfalls. This meant putting away survey equipment in their waterproof backpacks and connecting their climbing harness to the rope they secured before each drop. Care had to be taken to make sure that the stone did not cut into the rope.

At one of these drops, Enrech dislocated his shoulder. Pérez recalls frustration setting in. Without a partner he could not continue surveying. Fortunately, Zapata had followed them in this far. Pérez asked him if he was willing to help finish the job. A five-minute short crash course on rope techniques and surveying followed an enthusiastic "yes." Zapata picked up the instruction quickly and without hesitation. They successfully made it to the end of the cavern whose map was soon thereafter published in the Society's *Boletín*. The cavern totaled 510 meters (projected onto a horizontal plane), with

170 meters between its highest and lowest point. It “ends” in a deep pool with no apparent current but whose depth could not be ascertained.⁴ Zapata is listed as one of the surveyors in the cavern’s cadastral entry (SVE 1977:225-226).

In his field notes Pérez describes Zapata as an "excellent companion" who would "not say 'no' to anything." In Venezuelan slang, Zapata "le echa bolas," or gives it his all. This is a disposition that a number of SVE explorers, particularly those that participated in the physically challenging Mata Mango expeditions, repeatedly evoke with admiration, a quality tacitly expected of their team mates, whether baquiano or not. To Pérez, the baquianos such as Zapata who accompanied them in these expeditions were “adventurers” who “enjoyed exploration.” He recalls Zapata’s extraordinary willingness to throw himself into the dark pool deep in Bastimento 1, eager to carry on the exploration. “He was very enthusiastic like all of us [SVE members] during that time.”

Prior to an expedition to Mata de Mango, the SVE would send a telegram to Domingo Maita, a respected Chaima elder who lived in Yucucual, a small mountain community near the town of Caripe. The group first established its relationship with Maita in the late 1960s. From then on, this relationship grew and intensified, particularly with those SVE members who made repeated visits to Mata de Mango. One of them, Carlos Galán stands out for his exceptional dedication both to the speleology of Mata de Mango and the indigenous men who made it possible. I want to highlight Galán because of the ways he so powerfully embodies and transcends speleology’s dual character as a sporting-science. Even more intriguing are his explorations of other domains beyond the

⁴ Again an example of the open-ended character of cave exploration and surveying. Could the cave go further? With scuba gear it is probable that further passages might be reached.

scientific that speleological encounters in Mata de Mango have made possible. In these encounters, Galán enacts Fabian's ectasis (2000). We do not have the story of the indigenous counterparts in these experiences, but the length and apparent intensity of their relationship (almost spanning 3 decades) suggests some kind of retribution, some kind of coevalness that cannot be ignored even its precise nature cannot be analyzed and confirmed. I work with the available clues. Among them, is the particular landscape where these encounters occurred and relations were forged. In fact, we ought to consider this landscape and Galán's own speleological sensibilities, both ideological and physical, together as mutually constituting. Surely, Monagas's mountains and caves would be there regardless of Galán's existence, but their knowledge and representation as part of a greater karst landscape would have been different had it not been for Galán's particular engagement commitment to representation. Even more important has been the special relations he has forged throughout the years with the expert Chaima baquianos who inhabit this region. Again, he was not the only one to gain the esteem of these men and vice versa. Yet, it was Galán's vision of and commitment to a different science, an alternate speleology, with a more inclusive and non-exploitative model of knowledge that made a critical difference. The karst of Monagas, its people, and Galán's life-long efforts in the context *la Sociedad*, illustrate how "[m]aking nature, making places, and making persons are ineluctably social and incorrigibly intertwined processes" (Mueggler 2005a:722).

Carlos Galán

To my father, Galán “was the Society's first true, and perhaps only, speleologist.”⁵

Together they participated in many expeditions to the greater Caripe region. They shared qualities that made them perfect expedition partners: exceptional physical endurance and swiftness, survey and rope skills, an intensity focused on getting to the end of the cave and getting the job done. Unlike Galán, however, my father practiced speleology as a pastime, a means to get out into the mountains. His main career was in medicine. Aside from a couple of research projects on histoplasmosis and the physiological effects of long-term cave isolation in the late 1960s, he did not pursue cave science beyond the goal of producing cave surveys. In contrast, since high school, Galán has been focused on speleological pursuits, and of all past and current SVE members, is the only one employed as a speleological researcher (in the Society of Sciences Aranzadi, in San Sebastián, Spain).

Galán was born in San Sebastián, Spain, in 1949. As a boy he moved to Caracas when his mother divorced his father and married a Venezuelan. As a high school student he was part of the Sociedad de Ciencias La Salle, where he met Omar Linares and my father. All three speak highly of these years, of the opportunities that this Society offered, particularly in gaining field science techniques during group excursions. Galán followed Linares and my father in contacting the Speleological Section of the Sociedad Venezolana de Ciencias Naturales, an episode that he recalls with surprise, since “they

⁵ Indeed, of all SVE members, both past and present, Galán is the only one to be hired within a scientific institute that recognizes speleology as one of its specialties. Beyond, this, however, I believe that this characterization reveals my father’s bias towards the exploratory (read “sporting quality”) of speleology. While other SVE members have matched Galán’s dedication to the *science* of speleology, no one has done so while at the same time pushing the boundaries of speleology as a sporting pursuit. Galán has done both, simultaneously, because, as Galán himself has stressed, each relies on the other.

were received with open arms" (Galán, Interview, March 7, 2008). Upon graduating from high school, Galán returned to Spain to study biology at the university. He grew interested in cave animals, and began collecting specimens that he would take to researchers focused on biospeleology in both the Society of Sciences Aranzadi and at the Laboratoire Souterrain de Moulis (part of the National Center of Scientific Research). He always was encouraged to pursue his speleological interests. But along science he grew increasingly enthusiastic about overcoming the physical and technical challenges of vertical caving. He joined international expeditions that explored the deepest vertical pits in the region. Interest in rock and mountain climbing followed. In 1970 he was invited to an expedition in Argentina. There he ended up staying for 7 years, and even helped form the Centro Argentino de Espeleología.

Galán describes his time in Argentina, which coincided with the country's "Dirty War," as a sad period. In 1976 he managed to exit the country and return to Venezuela, a change that he recalls as extremely positive, since he was able to reunite with old friends. The Venezuelan Speleological Society became a home. In 1997 he moved back to San Sebastián, where he formally joined the research staff of the Society of Sciences Aranzadi. Even while living abroad, his commitment to Venezuelan speleology remained strong, traveling to Venezuela at least once a year, joining SVE expeditions, writing up biospeleological research papers, and producing cave maps to add to the National Speleological Cadastre (Galán, Interview, March 7, 2008).

Upon his return to Venezuela from Argentina Galán made Sucre state, just north of Monagas, his home. The Society's correspondence archives contain many of Galán's letters to the group, most of them addressed to geologist and long-time SVE member

Franco Urbani, reporting on his very frequent trips to the karst within the Turimiquire Range and neighboring regions. The letters are either handwritten with neat and small handwriting, or typed, all of them barely leaving any blank space or margin. Their content is extremely descriptive, focused on the exploratory and scientific potential of the area in question, often eager to discuss potential hypotheses of karst formation. Their frequency, formality, and speleological rigor befit a man so intensely focused, both intellectually and physically, to speleological practice and all that entails: exploration, science, surveying, and critically, writing.

During his many visits to Mata de Mango, Galán befriended Domingo Maita. To my father and other SVE members who often traveled to the northern Monagas karst, Maita esteemed Galán as a son (Maita also was 30 years Galán's senior). While Galán does not use kin terms to describe his relationship with Maita, he does provide details that suggest an exceptional degree of affinity between the two men. In a 2011 interview, he described Maita as a shaman with beliefs in spirits who kept Chaima traditions alive. "Too bad I did not record him," Galán noted, "but perhaps if I had he wouldn't have talked" (Galán, Personal Communication, August 5, 2011). Several times he saw him go to the entrance of a cave to ask the guardians (the spirits of nature) to take care of us (before starting the exploration). Several times Galán arrived to a cave that had small offerings at its mouth. Pérez confirmed this.

As I note in Chapter 2, anthropologist Marc de Civrieux describes the form that some of these offerings took for the Chaima when they were about to enter a cave (de Civrieux 1998:125). These descriptions, however, are based on oral accounts. This is a point that Galán stressed. While conceding the value of de Civrieux's work, Galán was

emphatic that the kinds of insights he and other fellow SVE members gained of the living indigenous conception of the landscape and its spirits is based on a radically different relationship. This relationship is premised on going on expeditions together. Along expeditions, SVE members appreciated knowledge and practices that went beyond the ritualistic and utilitarian aspects of Chaima-cave relations associated with guácharo bird capture described in Chapter 2. In the 2001 obituary of Domingo Maita that Galán authored and published in the SVE's *Boletín*, he describes him as an "speleologist in the sense that he had explored many caverns, had descended imposing pits with ladders made of reeds, and had climbed subterranean walls and vaults to reach the nests from which young oilbirds would be captured" (2001:70). By describing him as a *speleologist*, Galán broadens (and perhaps even challenges?) the kinds of knowledge and practices associated with science. Maita, along with the other men who repeatedly joined the SVE Mata de Mango expeditions, could describe, often with perplexing accuracy, the dimensions and connections of underground systems. They described their findings orally, using "brazadas" (arm's length) as unit of measurement. This knowledge resulted from entering caves *well beyond* what is necessary to capture oilbirds. On this point, Galán, Pérez, and other SVE members that joined them in these expeditions are emphatic.

SVE explorers often arrived to the entrance of a cave, many of them considerable pits, that had already been rigged with wooden ladders and "bejuco" or reed ropes that baquianos had crafted to aid in their bird hunting and exploration (I witnessed this in the 2008 expedition described below). In 1981 Galán authored the most thorough description of the tools and methods associated with these indigenous exploratory techniques published anywhere (Galán 1981).

Guácharo hunting involves teamwork among hunters (with parties ranging from 4 to 20 men) with the skills to build and use the necessary tools to access the caves and collect the live guácharo chicks from their nests. As Galán notes, moreover, guácharo hunters are careful not to decimate the guácharo population of any one cavern, so they rotate among the many caves of the Mata de Mango region. This emphasizes the exploratory aspect of the practice, which goes beyond trekking back and forth to habitual hunting grounds. Before a hunting trip every season (usually between April and May after guácharo chicks are born), several reconnaissance journeys are made to determine exactly which caverns provide the best hunting options. This is done by exploring the cavern's mouth, whether this means climbing down a pit or climbing up to the ceiling of a cavern, to determine the location of the nests. This exploration is done with tools that the hunters produce with their hands and machetes and materials they gather around the cave. Their production takes place in a group, usually under the direction of a more experienced hunter who, because of his age, might not actually participate in the hunting. Wood logs of different lengths and widths are used as "ropes" to pull oneself up to reach higher ledges. For less accessible ledges, the hunters build ladders that they lean on the cavern's walls. Other times a single sturdy pole is used with attached stepping logs (Fig. 6.1a, b, and c). To descend vertical pits, flexible ladders are made with *bejuco* (lianas, woody vines) and fixed at the pits' entrance. During the actual hunts, captured chicks are tied to a belt secured out the hunter's waist. An entire hunting trip might last up to a week. Several hundred chicks might be fetched at one time (Galán 1981:28-35).

Galán's research help dispel the stereotype that indigenous practices associated with caves are limited to functional uses of the resources.^{6,7} They involve "an adventurous spirit" (Galán 1981:31). Others have made this claim. Based on his ethnographic work among the Shuar Indians of Ecuadorian Amazon, Steven Rubenstein challenges the assertion that such experience belongs to the domain of modern Western culture (2006:236) Moreover, in the context of ongoing indigenous politics, not just in Caripe but in Venezuela and Latin America more generally, his publication helps challenge the idea of the Chaima culture "as dead."

Baquianos as Hired Laborers in Comparative Perspective

To Pérez,

Those guys [the baquianos] were proud to share with us ... we did not pay them much ... we established a unique relationship, they enjoyed exploration, but their methods were limited and in a way we [with our climbing techniques] made it possible for them to explore further. There was no difference among us. They were our companions. [Pérez, Personal Communication, August 8, 2011]

In fact, baquianos (including Maita) were routinely paid a daily amount. I have no data to compare this payment to these men's other sources of income. It appears that baquianos were not routine hired day laborers.⁸ Thus, there was no straight-forward way of calculating the compensation for a day's loss of wage. In any event, SVE expeditions to

⁶ See Watson 1974 for an early and classic commentary on this theme.

⁷ Galán emphasizes that baquiano incursions into caves show no negative impact on the cave itself. This contrasts markedly with caves closer to the town of Caripe and whose location are common knowledge, most of which have been trashed and vandalized (they lack protective gates) (Galán 1981:30).

⁸ In a conversation with Francisco Brito, one of three baquianos who lead the 2002 SVE expedition to Mata de Mango, he noted that he "worked the land." However, I do not have details regarding precisely what this meant, if he worked his own land or somebody else's for a daily wage. This is a topic that begs further research.

Mata de Mango typically took place during Holly Week, which was the longest national holiday during which most Venezuelans did not work. Moreover, the baquianos of Mata de Mango do not, beyond the SVE explorers, lead tourists on mountain treks. This contrasts to the indigenous guides of Canaima National Park, for example. Given the amount of tourism in the area, they have organized and set the fee for their services. Sherry Ortner's analysis of mountaineer-Sherpa relations in the Nepalese Himalayas emphasizes the importance of payment to the Sherpa porters (1999:66-67). Without wages that porters considered worth the extraordinary risks involved in their work, most would not have ported foreign mountaineers up Mount Everest. With her analysis, which includes a broader appreciation of the role of wealth within Sherpa culture, Ortner helps dispel (or at least diminish) the romantic ideas among some foreign mountaineers that the Sherpas were in it for the love of the mountain (1999:202).

The SVE never has established set rules regarding how much to pay the baquianos. In fact, according to Pérez the topic was often debated within the group. Some, including himself, argued that the baquianos should be paid more than just a token amount. Others, such as Galán, cautioned against excessive amounts that would threaten collaborative and seemingly egalitarian quality of the affair. Both perspectives were deeply (and I believe genuinely) concerned with exploitation. It is important to note that Galán's view was a commentary on the ways he perceived both his baquiano friendships and the SVE: By paying more, the impression might be given that the group was made up of wealthy members. In fact, the personal wealth of individual members at any one time of the group's existence always has been variable, with some truly making an effort to come up with their share of the pooled resources to pay for gas, food, and, in this case,

baquianos. Thus, “more pay” for baquianos could, at least in theory, stress the apparent egalitarian quality of the SVE’s own internal structure by burdening some members much more than others.

This is a topic that begs further investigation. There is, however, evidence to suggest that despite the presence of pay (in the form of money), the SVE-baquiano relationship was not the kind that characterized the mountaineer-Sherpa situation or even the more evidently exploitative arrangement of the 1951 Orinoco headwaters expedition. To begin to appreciate the difference, we must understand that this was not just an SVE-baquiano relationship, but one that developed within a particular kind of landscape that both groups experienced and valued in complementary and perhaps even shared ways. Moreover, these were relationships forged over many years. Thus, I evoke the notion of “encounter” with caution: although my present case has much to relate to the literature on cultural encounters that I have briefly referred to, in other ways it departs from it. The longevity of these relationships, based on shared experiences during many expeditions, is an example of this.

As Ortner notes, the Himalayan mountains were sacred to the Sherpa (1999:128-130). This sacredness involved a distanced reverence and respect. In other words, Sherpas did not venture up mountain peaks. They only began to do so as part of the growing popularity of adventure sport and travel that Westerners initiated in the early 1930s and which dramatically expanded and accelerated after the WW II (Ortner 1999). While there were some Sherpas that embraced the sporting challenge of mountaineering and even exhibited competitive ambitions among themselves and even with the international mountaineers, the concern about polluting, about disrespecting the mountain

have remained very strong (Ortner 1999:127-130). Again, I am limited here by my own ethnographic scope; I have no direct evidence regarding the baquianos' views of caves in terms of their sacredness. I cannot ascertain whether or not the Chaima indigenous worldview that anthropologist Marc de Civrieux describes (1998) was (is?) relevant to the baquianos of Mata de Mango specifically or even to the broader indigenous and mestizo community living in northern Monagas and southern Sucre states. Galán considers most of the baquianos he has personally known as Chaima descendants; only a few maintain "their traditions." It is certain, however, that Domingo Maita was one of them. It also appears that the baquianos who joined the SVE expeditions while Maita was alive highly respected him as a shaman, as a cacique. Thus, it is probable that his beliefs might have influenced/reflected other baquianos' conceptions of and practices within the Mata de Mango landscape, including their incursions into caves and their guácharo hunts.

This brings me to a key point, and that is that unlike the Himalayan Sherpas, baquianos *did* venture into caves independent of the SVE's speleological goals. As I have already noted, they did so to hunt for guácharos but also to *explore*. We know what this experience meant for the speleologists, both in terms of embodied practice and the broader meaning of *la Sociedad* as a unique project that celebrated collaborative and democratic forms of civic science in Venezuela. Based on the speleologists' accounts, it appears that baquianos deeply enjoyed the experience of venturing into caves (although they did not always do so *along side* the speleologists during their expeditions together). The possibility must be considered that the intensely embodied encounter with stone, within an underground landscape that *opened up* in unexpected ways, appealed to these men in ways that similarly captivated their speleological counterparts. What we do know

for certain is that they (the baquianos) were willing and able to traverse passages together, engaging in the teamwork that cave exploration and survey demands.

The camaraderie that such engagements engendered extended beyond caves themselves to the greater karst landscape. Part of this camaraderie, it appears, was based on the speleologists' performance. According to Pérez, Maita repeatedly expressed his pride in the *caraqueños*' abilities to keep up with his pace along arduous hikes and to carry their own bags. It is Pérez's interpretation that men such as Maita and Zapata felt great honor in having SVE members depend on them for their wellbeing deep in the Monagas karst. Both Pérez and Galán coincided in the belief that the baquianos acted as hosts to visitors in their own backyard. Many times baquianos swiftly constructed a refuge with banana leaves under which the explorers would sleep or share the day's hunt. In Maita's obituary, Galán notes:

How many times have we not exited a pit, well into the night, under inclement rain, and there awaited Maita to help us with ropes and guide us back to camp, where a [recently hunted] and roasted limpet or armadillo waited for us while we explored a cavern. [2001:70]

The tasks of building a refuge, clearing a path with a machete, carrying some of the explorers' collective equipment (typically ropes), and cooking a meal might well describe the kinds of arrangements between tourist/explorers and their paid guides. However, viewed from the perspective of hosts honored to provide for their guests, these tasks take a different hue. (In my knowledge, SVE members *never* required their baquianos to perform any of these tasks beyond the arrangement, set before the start of the trek, of helping carry some of the shared climbing equipment, typically ropes.) Moreover, these were tasks that embraced the baquianos' unique skills and knowledge of *their* environment. As Pérez described it, "These guys would prepare a limpet as if to say, 'We

do this because *you don't know how.*' I never saw Domingo *serv*ing me. Much less Zapata. That would have been deeply embarrassing" (Pérez, Personal Communication, August 8, 2011).⁹

I asked Galán what was "in it for them." In his view, based on conversations with Domingo Maita, they (the baquianos) "did good [because by doing so] nature would be good to them." Galán insisted on these men's relational conception of nature and in their own poetic capacity to acknowledge its beauty: "[With Maita] we spoke about the beauty of stalactites, he did so with pure poetry, I don't know where he got his words. I was very fortunate to get to know Domingo. His teachings have been very valuable to me." In Galán's view, Maita's appreciation of nature emphasizes the apparent contradiction between science and mysticism. "Science is cold ... its terminology is castrating, along with the ideology behind scientific thought ... of course there is something magical in those sacred spaces" (Galán, Personal Communication, August 5, 2011).

I have chosen to consider Pérez and Galán's interpretations and recollections of their relationships with the baquianos of Mata de Mango as examples of "encounters"

⁹ Pérez and Galán's suggestion that we think of the baquianos as their hosts leads us to ask how might have these relationships affected the baquianos' relations within their own communities. Did Maita's affiliation with the speleologists translate into social capital that bolstered his position as a cacique? Were there other men in their community that aspired to participate in an SVE expedition but were kept from doing so by Maita himself? For example, in the 2002 Mata de Mango expedition, Pérez expressed the concern that the three baquianos José Roberto Cordero, Abraham Cordero, and Francisco Brito had not had a direct say in how much they would be paid per day. Instead, their wage was determined between their community elder Miguel Morocoima and the SVE expedition coordinators. Because of this, Pérez asked that their pay be raised. Fellow SVE members Carlos Galán and Francisco Herrera cautioned that doing so could dishonor a previous arrangement. They also put forth the counterarguments noted in my discussion above. How precisely did SVE involvement impact community dynamics? Might they have encouraged hierarchical arrangements within the communities that their baquianos called home? These are all critical questions that a thorough ethnographic inquiry into the "indigenous" side of the "encounter" needs to address.

that appear to deviate from the trope of the exploitative relations between the “Westerner” and the “Native.” I want to suggest thinking about their encounters, which were repeated over a period of three decades, in terms of friendships forged through collaborative engagements in/with a particular kind of landscape. This was a landscape that promoted, indeed *demanded*, teamwork and did not lend itself to the competitiveness that often characterizes mountaineering. The only way that Pérez could survey to the apparent end of Bastimento 1 was with Zapata’s help. In turn, Zapata benefitted from Pérez’s climbing equipment to explore beyond the point he would have reached with his own techniques of exploration. Hiking through the forest, the baquianos set the pace. It was the speleologists’ challenge to keep up. There was no evident payoff in getting there first. First where and for what? The geographical goals of expeditions were hardly as evident as a mountain’s peak. This was true both along the hikes in the dense vegetation and closed valleys and within caves themselves. On Everest, the goal is clear. It also is evident who made it to the top first. Moreover, porters make repeated ascents, making them the indisputable experts. As Ortner notes, their expertise sometimes threatened international mountaineers’ sense of accomplishment (Ortner 1999:170, 192). Mountaineers not only competed against the mountain, but also among themselves and with the Sherpas. I do not contend that the mountain *caused* these behaviors, but it certainly made them possible.

I will push this contrast further. Ortner makes clear that most Sherpas questioned the goal of reaching Everest’s summit, often with extraordinary cost of lives (to both Sherpas and foreigners) (1999:6-8, 127). The fact that more and more westerners were drawn to repeat the feat may have added to the sense of purposelessness from the

Sherpas' perspective. In contrast, SVE expeditions explored and surveyed “new” caves every time. A repeat visit was necessary only if previous attempts had not been successful for one reason or other. Thus, no particular cave became a recreational stage for adventure-seekers willing to measure their might against the challenges of nature, as some might judge the case of Everest and its climbers. (This difference, however, does not absolve speleology from the “conquering” gesture that characterizes mountaineering, but this is comparison or characterization that cannot be done lightly. I address this point below and again in Chapter 7.)

It appears, then, that baquianos understood and even supported the SVE cadastral project, at least indirectly, by their willingness to lead speleologists to unsurveyed caverns and to repeatedly point to other potential sites worth exploring. At times speleologists shared their surveying progress with their guides. This was the case with Pérez and Zapata in Bastimento 1. Pérez recalls showing Zapata his field book where he was noting the survey measurements and the sketch of the cave. According to Pérez, Zapata took interest and quickly grasped the fundamentals of the practice. “I am sure if I had given him the necessary tools Zapata would have surveyed on his own.¹⁰ He had an extraordinary spatial conception of the cave” (Pérez, Personal Communication, August 8, 2011).

Spaces of Ecstatic Encounter... but also of Socialization and Alienation

In Chapter 3 I suggested we think about the cadastre as a boundary object in its capacity to bring together the diverse membership of the Venezuelan Speleological Society. Here I

¹⁰ By this Pérez meant that Zapata and him could have traded the place of sketcher and tape leader that I describe in Chapter 4.

propose extending that argument to include men such as Domingo Maita and José Zapata who repeatedly joined the group's expeditions to Mata de Mango and critically contributed to their success. Much like the non-scientifically inclined of *la Sociedad*, the baquianos appeared particularly attracted to exploration, not just within caves but beyond them as they hiked along the heavily forested ridges and valleys of the region that they knew best. This invites thinking about speleology itself as a boundary *practice*. Its collaborative and embodied qualities also set the stage for "ecstatic" encounters in which speleologists and (it seems) baquianos enjoyed intense experiences of risk-taking and sharing during evening camps. Even if these men's conceptions of the spaces they traversed were not the "same," shared practices may have promoted "transcend[ance of] psychological and social boundaries" at the moment of encounter (Fabian 2000:8-9).

But just as speleological pursuits united diverse actors in the ridges and pits of Mata de Mango, they also alienated others, this time within the SVE itself. This occurred as some in the group embraced a different approach to exploration, one characterized by a minimalist ethic. As I will show, this ethic was intimately tied to notions of identity and ideology beyond speleology itself.

Speleological Practice and the Minimalist Ethic

I have joined Carlos Galán in three SVE expeditions in Venezuela. Every time Galán's stamina and stoic minimalism expressed in everything from his talk to his gear has impressed me. He packed his old blue bag without sparing a gram, volume as much of a premium as the white space on the paper he used for correspondence. Throughout each trip he wore the same clothes, ate little, but smoked constantly. In 2002, when I first

joined, along with my father, an SVE expedition to Mata de Mango, I recall him saying of his friend Galán: "That son-of-a-bitch [coño de madre] always has been and will always be like that, waiting for the rest of the group puffing a cigarette."¹¹

From his strong and lean body, his choice and manner of packing his expedition equipment, and his determination to get the job done in the field, Galán epitomizes a minimalist ethic that pervaded much but not all of the Venezuelan Speleological Society in the 1970s.¹² This minimalism was not always the concern, much less the imperative, of Venezuelan speleologists.¹³ In an article that provides a retrospective view on the SVE's

¹¹ Galán recently joked with me regarding his smoking and my endless questioning of his experiences:

You see that many caves are sites of power. For their natural radioactivity and the elevated ionization in the air, they transmit positive and youthful energy, even to smokers like myself, ha, ha. Take note of this for your anthropology of caves, I am serious. [Galán, Personal Communication, December 1, 2011]

¹² This was not unique to their time and place. As Ortner notes, a similar ethic became dominant within the mountaineering culture at around the same time (1999). New developments in technical equipment that was lighter, smaller, and more effective also broadened the horizon of what was possible. Specifically, this opened the doors to smaller expeditions in terms of participants and equipment. This shift also signaled a rejection of the militaristic and hierarchical arrangements of expeditions in the past. Most of the SVE members who embraced these changes were either close to or personally engaged with their practice outside of speleology. As I have already mentioned, Galán spent several years climbing mountains in southern Latin America. Pérez also pursued mountaineering, rock climbing, and other "extreme" sports two decades prior to the coining of the term and their commodification. The community of these "proto-extreme sports" enthusiasts was very small in Venezuela in the 1970s and 1980s and their ideas and practices spilled into speleology.

¹³ In a 1962 group picture that has become emblematic of a by-gone era, the 8 members of the Speleology Section of the Venezuelan Society of Natural Sciences embody the essence of *the Explorer* (Fig. 6.2). Wearing construction overalls, knee-high boots, and fiberglass miner helmets with an attached carbide lamp, the men, in their "proud and determined posture" wearing "travelers' quasi-military garb," exhibit a "proud and determined posture" (Fabian 2000:5). As both pictures and personal accounts reveal, some of these cavers wore belts with knives or even guns, items they deemed part of the proper equipment to meet the field challenges that a speleologists, in their view, might face.

55 years of exploration, the authors (one of them Galán) attribute part of the shift in exploratory techniques and approaches to the geographical and geological challenges posed by unexplored caves:

When searching for new horizons [of exploration], since the caves of easy access had been explored, springs forth on its own the notion of lightweight [exploration], of small, autonomous, and efficient equipment. This also obeyed a geological imperative. [Urbani, Galán, and Herrera 2006:21]

Until the early 1970s, most explorations had been carried out in "places of relatively easy access, in predominantly horizontal caves, and at most, in vertical pits with only a short succession of small drops" (2006:21). Whenever more substantial drops were encountered, such as in the case of Walter Dupouy Cave (east of Caracas), a ladder would be used (SVE 1975:114-119). This 1,122 meter-long cave has a number of drops throughout its development, totaling a vertical distance of 120 meters. The most challenging of these is towards the middle of the cave. At 10 meters, this drop—a waterfall—plunges into a subterranean lake dubbed "Lago Isabel," after de Bellard's wife. The SE-SVCN cavers overcame this obstacle as did most of speleologists at the time: with an electron ladder. French caver Robert de Joly (1887-1968) first designed electron ladders to aid in his own ambitious cave explorations in Europe. They quickly became popular among speleologists given their lighter weight and strength. Electron ladders are made of steel cable wire and aluminum footsteps. Although these ladders can connect together to expand their length, their safe use to overcome vertical distances is limited. For one, the explorer had to be able to secure the ladder at the top prior to a pit descent. Thus, if exploration required climbing up a steep wall, and no conventionally sturdy

ladder was available, the electron ladder—itself a hybrid between a conventional ladder and rope—would be useless.¹⁴

The SVE's retrospective article points to the lack of proper equipment as another factor explaining the limits of exploration of the earlier generation of speleologists.

Description of this fact, however, is tinged with judgment of how an explorer *ought* to traverse the karst landscape. In the old timers' explorations, the authors remark,

[i]numerable equipment items and supplies had to be transported for work in the caves. The explorers carried on mules countless bags (that included

¹⁴ In 2008, I used an electron ladder during a short weekend trip with some members of the SVE and the Universidad Central de Venezuela's Centro de Exploraciones e Investigaciones de Campo (UCV-CEIC) to Walter Dupouy Cave. The ladder was secured with rope to a protruding boulder just above "Lago Isabel." Water gushed down the passage and along this wall. I carefully observed the proper technique: one must make an effort to turn the ladder perpendicular to the rock, lest one's fingers get clipped by the aluminum steps and cable wire draping the rock. Going down feet first requires placing the heels of the feet on each rung. During my descent I struggled to keep my form, the cable ladder turning and painfully clipping my extremities against the wall. I tried to use my elbows, knees, and toes to separate the ladder from the stone; but it was very difficult, especially since it now bore my entire weight. I finally managed to descend the short pit. Exhausted and bruised, I gained a greater respect for the "old timers" who routinely used ladders in their caving exploration.

Some cavers who trained in the ladder tradition evoke the bygone era, which by the 1970s gave way to more technical rock and mountain climbing techniques, with a sense of nostalgia. Italian geologist and caver Paolo Forti, already in his 60s, expressed that cave exploration with the ladder required more teamwork, more trust invested in one's partner, who would help secure and stabilize the ladder while one either descended or ascended its wobbly rungs. Not so with more technical rock and mountain climbing techniques, which he argues allows for more solo work. Not all cavers share this opinion, however. My father, who lived the transition from the electron ladder to the new climbing techniques applied to cave exploration, was happy to see the ladder go, describing it as inefficient (it is bulky and heavy to carry for the amount of meters it allows you to overcome), cumbersome, and dangerous. He dismissed the idea that the ladder promoted greater teamwork. Whatever the opinions, it is beyond question that new climbing techniques exploded the exploratory capacities of cavers, and it did so in a way that also helped minimize the impact on the cave rock itself. Caves with extensive vertical development became accessible to explorers' bodies and shining lights. Speleological practice delved into depths unimaginable. The current world record of deep cave pit exploration is held by a team of Ukrainian cavers for their exploration of Krubera Cave in the Arabika Massif of Abkhazia, Georgia. As of 2007, this cave is 2,191 meters deep.

work tables, folding chairs, tarps and tents, gas lamps, hammocks, nets for bats, innumerable and heavy equipment including cages for living mice for mycological studies, materials for archaeological excavation, and the most diverse implements imaginable) to set up camp at the mouth of the cave whose access did not involve long trajectories. This was the case with Guácharo [Cave], el Agua Cave, Alfredo Jahn, and many others. A system of lightweight exploration by foot, in which all of its members carried on their shoulders all of the necessary equipment for a week of fieldwork had yet to be conceived. [2006:21]

This description reveals the contours of the minimalist exploratory ethic that Galán would embody and enact in the field. This system of lightweight exploration was and is not just about the equipment available to the explorer or even a geological imperative. It was and is about embracing the idea of self-sufficiency in the field, of packing only what is needed, and to carry it yourself, *on foot*. Viewed in the context of naturalist activities in a post-colonial context, this self-sufficiency also may be read as a rejection of the imperialist model of science and exploration. As Ortner notes, Everest expeditions increasingly adopted this perspective in the 1950s (1999). In the context of speleology as a field science, whether or not particular members embraced and enacted this ethic also points to the complex dynamics that furthered, united, but at times also strained the collective enterprise of *la Sociedad*.

The description of the “old timers” exploratory practices also contains a judgment on material excesses. Despite his climbing and athletic skills, and attraction to the sporting aspects of outdoor activity, Galán has been and remains concerned that sports (and its related equipment) further speleology. In a 1980 letter to Franco Urbani, then president of the SVE, Galán states concern with the embrace of new climbing gear without focusing on the purpose of their use: "Personally I fear that the novelty of the jumars and the exploration of large deep pits instigate sports caving tendencies

[tendencias espeleítas] contrary to the scientific practice that has characterized the work of the SVE for so many years."¹⁵ Galán scoffs at sophisticated and expensive equipment that serves no purpose. Worse yet is sophisticated and expensive equipment used in exploratory pursuits that claim to be speleological but that in his view are more about individual showmanship than science. On this count Galán offered several illustrations. After the creation of the SVE in 1967, which followed the rupture between two of its leaders, Juan Antonio Tronchoni and Eugenio de Bellard Pietri, de Bellard went on to reconstitute a new speleological group, again under the umbrella of the Venezuelan Society of Natural Sciences. This group once sponsored a scuba-diving exploration of several sumps in Guácharo Cave. To Galán, these efforts were completely useless, more about showmanship and promotion than about cave science. Even more than de Bellard, many SVE members constantly contrast their exploratory and scientific ethic to that of Charles Brewer, a popular personality in Venezuela, widely recognized by the general public as the country's premier explorer and naturalist.¹⁶ Galán scoffed at some of Brewer's claims in cave discovery and exploration, many of which resulted from aerial surveys and, the SVE argues, improper measurements. To Galán—indeed, to many members of *la Sociedad*—these practices are symptomatic of "facilismo" – the easiness or shortcuts with which money, success, or power were increasingly being achieved in "Venezuela Saudita" [Saudi Venezuela] where oil money and its associated cult of wealth permeated all of society (see Perera 1976a).

Even as Galán decried “sports caving tendencies,” however, he embraced a minimalist ethic that in practice was hardly different from sports caving pursuits. While

¹⁵ See Chapter 1 for a fuller discussion of the definition of the term *espeleista*.

¹⁶ See Chapter 3 for more on Charles Brewer.

the ends might have deferred, the means of achieving them overlapped. This ethic, which, according to the SVE retrospective article noted above corresponded to a “geological imperative” (Urbani, Galán, and Herrera 2006:21), altered the composition and dynamics of exploration teams. Less sports-oriented (and typically, although not always) older members opted to participate in less physically and technically challenging outings. The embrace by some of these exploratory techniques effectively created a group of elite speleologists within the SVE. Dubbed “los cunaguaros” (the ocelots), these few men were able to push the boundaries of speleological knowledge in Venezuela. In the particular case of the Monagas karst, these men’s capacities and skills also created the possibility of long-term engagement and collaboration with Chaima baquianos. At the same time, however, they created rifts within the SVE and concern for those who emphasized the collective ideal of the speleological enterprise.

Some of the newer members to the Society in the 1970s and 1980s took on the challenge of joining the “ocelots” on their grueling expeditions to Mata de Mango. This was an opportunity for them to learn from the experts, a process that involved socialization and embodied disciplining that could either make or break an aspiring speleologist (or at least SVE member). Despite the emphasis on expeditions during long vacation breaks, many trips were done over the weekend, with barely any time to sleep. Alejandro Reig recalled his first trip to Mata de Mango in the 1980s when he was a teenager (Reig, Interview, July 6, 2007). On their hike back to the cars that they had left in the community of Yucucual, he could not keep up with the pace of the group. He stopped in the middle of the dark jungle and fell asleep. Next thing he knew my father, who had to turn back to find him, was shaking him, telling him to wake up: “¡Despiértate,

carajito! (Wake up, kid!)" Falling behind was not an option, since a long drive back to Caracas awaited. Several of the expedition members needed to work on Monday morning. Jose Antonio Lasso, a contemporary of Reig, also reminisced on the intensity of Mata de Mango outings (Lasso, Interview, January 13, 2008). On his first trip he was miserable, literally unable to keep up with the hiking pace. He recounted how at the time he made the commitment to get into shape, so as not to be left behind, an effort that paid off in future expeditions.

These stories are part of the SVE lore regarding both the Monagas karst and the cavers that pushed the exploratory and survey efforts in the region. When juxtaposed with the accounts of caver relations with the indigenous baquianos, I suggest we move away from the sports versus science dichotomy that in the case of Sarah Cant's analysis of British speleology appeared to explain much of the internal divisions among differently positioned actors (2006). In the rugged hills of Mata de Mango, with its predominantly vertical pits, "sporting" abilities are an important part of what made critical long-term relations with baquianos possible. Both, in turn, result in the growth of speleological knowledge. And yet, some SVE members question arrangements that result in only a few very elite cavers successfully participating in a caving expedition. To Francisco Herrera, who has been a member of the SVE for over 20 years, doing speleology also is about sharing with friends, enjoying the outdoors, about being part of a more inclusive team. Omar Linares, who joined the Speleology Section as a teenager along with my father in 1965 and then remained an active SVE member for many years, shared a dimmer view on the speleological elitism lead by Galán. To him, the rise of new exploratory technologies in the 1970s is to blame for shunning the participation of the older cavers ("los viejos").

Tronchoni, the most respected and loved of the “old timers,” offers an emphatic case against simple dichotomies (young vs. old, sports vs. science, etc.). Moreover, he reminds us of people’s changing perspectives over time. In the editorial of the Speleology Section's second edition of its bulletin *El Guácharo* (1965), he is emphatic about what constitutes a proper speleologist. Certainly, just visiting and exploring caves is not enough (that is what *espeleistas* do). Instead, a speleologist focuses on

the very diverse and uncommon study of hypogean fauna (biospeleology); the climatological conditions, temperature, humidity, underground currents (speleohydrometeorology); the intricate study and survey of underground galleries (speleometry); the varied photographic techniques (speleophotography); etc., in addition to the geological, archaeological possibilities and exploratory techniques... [all of this in addition to] intense teamwork... discipline and a spirit of camaraderie... skill, agility, and physical strength... Those who do not feel the calling of our "world," to work in some or all of the noted activities, will never be true speleologists. [Tronchoni 1966:1-2]

In an interview 40 years later, Tronchoni softened his stance. He regretted that “espeleismo” had become a dirty word among many members of the Society (as it had, for Linares and others). To Tronchoni, this attitude made the group at times throughout its history too exclusive, effectively jeopardizing its capacity to recruit new members and keep many who had interest in caves and the physical skills to explore them but no particular interest or professional ambition in science. In fact, in his own case, he had fallen in love, first and foremost, with the exploratory aspects of speleology, the very “espeleista” qualities that at one point he decried as a threat to the “goals of this young science,” but which he recognized characterized institutional Venezuelan speleology in its beginnings. Tronchoni’s view suggests that the field-based threats to speleological practice—the diversity of its practitioners, the difficulty of guarding its boundaries—are also its sources of strength.

Forging New Paths and Relations: 2002 and 2008 SVE Monagas Expeditions

The Monagas karst continues to yield new opportunities for exploration, mapping, and engagements with its indigenous community. Zapata died from a snake bite in the 1990s. Domingo Maita died in 2001. Another regular baquiano, Pascual Roque, had apparently left the area and settled in the town of Caripito. In a brief 2007 visit to the small community of Yucucual, I learned that Miguel Morocoima, the last remaining elder which whom the SVE had close ties, had passed away. Changes had occurred in the SVE as well. Older members left the group. Some, like Pérez and Galán, left the country, although Galán continued to travel regularly to Venezuela to join expeditions. New members who only knew of Mata de Mango by name joined the ranks. Moreover, the group shifted its focus to the northwestern region of Perijá in Zulia state to pursue the exploration of what turned out to be the longest cave in the country. There also was enthusiasm with cave potential in the Roraima region of southeastern Venezuela. These changes cooled speleological activity in Monagas, breaking the continuity that nurtured the unique relations I have described above.

Yet, potential for new caves in Monagas always remained. Galán had kept notes of Maita's many recommendations for future explorations. I turn to descriptions of two more recent expeditions to Monagas, one in 2002 and the other in 2008. With them I illustrate in greater detail the dynamics of speleological practice beyond caves themselves. They also point to changing relations both with the landscape and their indigenous inhabitants who traditionally have guided and even befriended SVE explorers in the past. I emphasize particular episodes that involve the kinds of socialization for us newer SVE members who have been part and parcel of speleological dynamics in these

mountains for over four decades. Exploration, science, and “society” –in the form of sociality both within and beyond *la Sociedad*—come together in the rugged Monagas karst, revealing their mutual definition, production, and hopefully, future.

The 2002 Expedition

In 2002, the SVE again returned to Mata de Mango for one of its Holly Week expeditions. Galán and his wife Mariam flew in from Spain.¹⁷ My father decided to join as well, embracing the opportunity to return to his country and share with old friends. I was a last minute addition, after my mother decided not to travel due to a back injury. As I noted in Chapter 1, this experience spurred my interest in speleology and eventually led to my dissertation project.

The 2002 Mata de Mango expedition again relied on baquianos. With Maita gone, the elder Miguel Morocoima helped coordinate who would guide us into the forested hills. He chose José Roberto Cordero, Abraham Cordero, and Francisco Brito, three men who knew the landscape well given their numerous trips to hunt guácharos in the region’s caverns. Morocoima began the trek with us as well, but soon turned back because of a painful hip (he walked with a cane). The Corderos and Brito also helped carry some of our collective equipment, mostly ropes. They did so in makeshift backpacks out of fruit sacks and rope. They also carried their guns. On one occasion they hunted a peccary, which they skinned and smoked. Some they shared with us; the rest they packed to take home. At night they also prepared two shelters with their machetes—a tilted roof made of

¹⁷ Marian Nieto has been participating in expeditions alongside her husband Galán since the late 1990s. Her exceptional strength enables her to keep his pace, although she admits that Galán carries most of her personal items in his bag, making her load much lighter.

tree branches and banana leaves. The SVE members slept in their sleeping bags under one of them. The other was the baquianos'. One evening they treated us to guácharo meat that they had fried over a fire. I recall the sheen of the liquefied fat that collected at the bottom of the pan. It was then that I first learned of its prized qualities and value to the Chaima that I describe in Chapter 2.

During this expedition the Society explored and surveyed four caves: El Culta Cave (254 meters of passage), Cave of the Caituco (64 meters), Cave of the Chorro (171 meters), and Nueva Cave (632 meters) (SVE 2003:45-49).¹⁸ All of the caves were previously known to the baquianos, although precisely what this meant I did not ask at the time. Three of the four caverns were relatively easy to access (no technical climbing required). The smallest of the three, Cave of the Caituco, had signs of previous visitations; a number of stalactites were broken. The entrance of the Cave of the Chorro was a spectacular vertical pit that formed a waterfall. Here the explorers rigged their ropes and rappelled in. It seemed as the crevasse seemed to gobble them up whole. What they did underground struck me as a complete mystery.

The 2008 Expedition

During my dissertation fieldwork in Venezuela, I joined the 2008 SVE expedition to El Alto de la Palencia. This region, located along the northern flank of the Caripe Valley, is very similar to Mata de Mango. Again, we would need the guidance of expert trekkers. This time, however, arrangements had to be made in Las Margaritas, and not the Yucucual, the community that the SVE had traditionally visited and was home to Maita,

¹⁸ The meter values correspond to the development of the cave projected onto a horizontal plane (the “length” of the cave) (see Chapters 2, 4, and 5).

Zapata, and Morocoima. Since I was in Caripe during the weeks prior to this outing, I was assigned the task of making preliminary contacts.

After several attempts to coordinate with several Guácharo Cave guides or park rangers to accompany me, I decided to head on out on my own. From an area map, I knew Las Margaritas to be just east of the town of Caripe, along the descending slope of the Caripe Valley that ends in the town of Caripito. A series of public bus rides got me so far. During my two hour wait for I am not sure what, I befriended the young woman who managed a food store right across the bus stop. She promised to flag down a reliable and trustworthy ride to Las Margaritas. At the sight of a white pickup truck driven with two men, she gave me the thumbs up. I could not have been luckier. The passenger was Danilo Carrera¹⁹, who not only lived in Las Margaritas but suggested potential baquianos. I met two of them at Carrera's small shack that he shared with his delightful partner Ofelia.²⁰ Both Eufebio Morocoima and the older Alex Matos were introduced to me as extremely experienced hunters who grew up trekking the region's forest.²¹ Eufebio's last name immediately signaled to me that he was of Chaima descent (de Civrieux 1998; Zapata, Interview, September 9, 2008). I explained what the Venezuelan Speleological Society was and the purpose of the upcoming Holy Week expedition. I explained too that the Society had a long history of exploration in the region, particularly towards the area of Mata de Mango, beyond the community of Santa Inés and Yucucual. I also stressed that Domingo Maita and Miguel Morocoima, both now deceased, had closely

¹⁹ A pseudonym.

²⁰ A pseudonym.

²¹ Both pseudonyms, although I preserve Eufebio's actual last name of "Morocoima," since it is a very common last name and, according to Chaima activists, a marker of Chaima ancestry.

collaborated with the cavers in many of their expeditions. I brought with me a copy of the 40th *Boletín*, which featured a picture of Maita next to the map of a cave he had helped explore. True to what several past and current members of the Society had explained to me, I used the *Boletín* as a presentation piece of the group's profile and activities.

I caught myself eager to prove that the Society was not an eco-tourism enterprise. I also did not want to give the impression that the Society was out to hire a guide for an ecological excursion. "We are different," I recalled Francisco Herrera telling me, stressing that the Society aimed to establish collaborations with a sense of exchange, of informal partnership, in contrast to the more blatant consumerist tourist-host model that pervades so much eco-tourism. And yet, I was to hint that we (the SVE) would provide some form of retribution. How to do so without spurring false expectations? As I entertained these anxious thoughts, Alex Matos started laughing with surprise when he recognized the picture of the late Domingo Maita in the SVE's journal. "He was my cousin!" he said.

Both Matos and Morocoima expressed eagerness to join us. They did so prior to my mentioning anything about pay. It is my impression that their eagerness was less about helping the SVE than having an excuse for a long trek in the mountains. Missing those long treks were precisely Morocoima's words. He worried, however, that a chronic muscle pain would keep him from joining us. He asked if I could bring him some ibuprofen. I agreed. They also asked for flashlight batteries and ammunition for their homemade rifles. After finishing the nth cup of coffee, I thanked the gracious Ofelia and

bid farewell to my potential baquianos, all agreeing to meet up again at the same place the weekend prior to Holy Week.²²

My SVE friends arrived to Caripe from Caracas on Saturday March 15th in the afternoon.²³ They came in two cars. One was SVE president Joaquín's small personal sedan. The other was an old Toyota Landcruiser, property of an ecology project that Herrera directs at the Venezuelan Institute of Scientific Investigations (IVIC). The car

²² Feeling that I had successfully completed the first part of my mission, I turned my focus on gathering the requested items. The ibuprofen and the batteries were easy to find. The *conchas*, however, were another matter. I started my search at a hardware store. I was told they had none. Similarly with 2 other stores. By the fourth shop, the salesclerk mentioned to me that he had none, and even if he did, he would not sell them to me, since they were illegal. At first I assumed he was teasing me, but as I later found out, this was in fact the case. Regretting not having consulted first with my Caripe host family, I managed to announce to half the town of Caripe that I was searching for illegal rifle ammunition, surely raising suspicions as to what I had in mind. My friend Beatriz De Bellard warned me against buying ammunition for the men, commenting that she had heard of individuals targeted by guerillas who were in search for the prized commodity. As ludicrous as that suggestion struck me—especially since I was only to buy enough for 10 shots—I began to worry about the consequences of the goods that I would provide our potential guides, especially since I would do this on behalf of the SVE. I contacted Francisco Herrera for advice. He dismissed De Bellard's suggestion, along with congratulating me for promoting non-ecological practices (hunting). While he meant to nudge me with a joke, I grew concerned with the consequences of my purchases... and ingenuousness.

The *conchas* pursuit ended with the help of Danilo Carrera, whom I bumped into at the Caripe market. He accompanied me to a store that is known for selling the illegal ammunition. Sure enough, the teller was quite hushed about the transaction, unwilling to give me a receipt. Each *concha* BsF. 7, or \$3 (at the official exchange rate). I walked out with 12 *conchas* carefully wrapped in a paper bag.

²³ As noted in Chapter 3, the members of this expedition were SVE president Joaquín Astort, a Spanish immigrant who started caving as a teenager in his native Spain, and continued his hobby alongside his job as an engineer at the Caracas Metro; Francisco Herrera, an ecology researcher employed in Venezuela's premier scientific institution, the Instituto Venezolano de Investigaciones Científicas (the Venezuelan Institute of Scientific Investigations, or IVIC); Luz Rodríguez, an earthquake geologist from the Fundación Venezolana de Investigaciones Sismológicas (Venezuelan Foundation of Seismological Research, or FUNVISIS); Maribel Ramos, a biologist working on a research ecology project that Herrera directs at the IVIC; Juan Acosta, an electrician from the Metro of Caracas; Carlos Galán, a biologist working at a research institute in Spain; Galán's wife, Mariam Nieto; and myself.

needed repair, which Joaquín provided in return for borrowing privileges. We were eight in total, and for the first time in SVE's history, the number of women equaled the number of men.²⁴ After picking me up from my host family's home, we drove to Las Margaritas (a one hour drive on a narrow and winding road). Everyone was eager to meet the prospective baquianos, hoping that indeed they would come through with their commitment.

Back in the Carreras' small home, we learned that Eufebio Morocoima would not join us since his muscle pains had worsened (I left the ibuprofen for him with Ofelia). Matos would join us in a couple of days since some unexpected business had come up. We were assured he would find us without a problem. Another baquiano, Jesús Ríos²⁵, would take Morocoima's place. Later that evening, as we set up our tents in our hosts' lawn, a young boy came up to us to tell us that Ríos was drunk at a party. "Let's hope he shows up tomorrow," Francisco Herrera shrugged.

SVE veteran Carlos Galán had already been in the region before in a previous caving expedition. He suggested this return trip since other caves were known to exist that the Society had yet to survey and add to the national registry. The late Domingo Maita provided this knowledge, along with the assessment that these caverns would require long ropes to access given their seemingly extensive vertical entrances. Thus, the SVE made sure to pack ropes and climbing equipment. Both are heavy. They also are, along with meals, a tent, survey tools, cooking stove and utensils, "collective" equipment, e.g., items whose total weight had to be distributed among all members of the expedition. Herrera and Galán monitored what in their experience was the best weight among the

²⁴ See Chapter 3 for a description of all expedition members.

²⁵ A pseudonym.

bags. Not everyone was in equally good physical shape. Likewise, not everyone had optimal hiking equipment (bags or shoes). And, as Galán and Herrera made clear, we would move as fast as the slowest in the group.

Twenty minutes into our walk through the edge of the town of Las Margaritas, we stopped at Ríos's home, which he shared with his mother, Marta Morocoima, her last name again evidence of Chaima heritage.²⁶ While Ríos gathered his items in a large bag for transporting oranges with an improvised loop of ropes that imitated a backpack's carrying system, Ms. Morocoima offered us coffee. Galán lit what was probably his 5th morning cigarette, and spoke again to us about group hiking rules: If you see that the person behind you is falling behind, then it is probably that he is too heavy and you are too light. Offer to take some weight of him. Also, if you reach an intersection in the path, make sure the person behind you knows where you are going... These words would become the object of endless jokes, on the one hand, and a source of tension on the other, for as soon as the hike began, it became clear that the group consisted of people with different training levels, even different attitudes regarding rests, whether or not to converse with other while hiking, stopping to admire the local vegetation, etc. Galán was by far the strongest and most focused in the group. He also was the least patient with anything that was not directed to the task at hand: finding and surveying caves.

The hike led us, for the first day, through “secondary” forest. I learned from Maribel, an ecologist, to read for signs that the vegetation in this area had been recently tinkered with, mostly to cultivate coffee. The *bucare* tree (*Erythrina poeppigiana*), a popular choice for shading coffee plantations, was everywhere. Its orange flower

²⁶ First name a pseudonym.

carpeted our paths. By the start of the second day of hiking, however, there were no more *bucares*. We were in “primary” forest (what Maribel described as *zona no-intervenida* [non-intervened zone]). We also knew we were approaching the caves since limestone outcrops began to appear. While knowing the geological makeup of the land helps guide the caver as to where caves might be located, the only fool-proof way to distinguish a small rock shelter from a more extensive cavern is to get to its mouth and explore it.

By the next morning paths in the forest were barely discernible. We moved forward slowly, the pace set by Juan Ríos's clearing of the vegetation with machete in hand. Carlos Galán was right behind him. The rest of us trailed behind. Several of us chatted and laughed, sometimes quite loudly. At one point, Galán stopped and turned to look at us, with obvious disgust, telling us to quiet down. He stated that with so much noise we would scare away potential prey. Understanding this episode requires considering the history, spanning over 30 decades, of the Society's engagements with this landscape and its inhabitants. As I have noted, these engagements strived, at least from the part of the speleologists, to overcome the colonial trope of the foreign (being from Caracas is foreign enough!) naturalist/scientist/discoverer who "heroically" treks through the jungle while the nameless "native" clears the path with *machete* in hand, and carrying the equipment (Fabian 2000; Pratt 1992). Galán's concern recalls Pérez's perspective of the baquianos as their hosts guiding their guests along their turf. Of course, neither Ríos nor Matos invited us on this trek. Despite the friendly arrangement and the efforts to respect the baquianos' time and purpose deep in the Monagas karst, they remained fundamentally hired guides to the urbanite speleologists who, without them, could not get to those caves, draft their maps, and grow their national speleological project. Perhaps

after repeated expeditions with these men would the kinds of friendships and “ecstatic” encounters that Galán and Pérez recall with a hint of nostalgia emerge. Encounters would morph into relationships that approximated the camaraderie, the collaborative effort, and even, perhaps, a privileged glimpse into living indigenous practices... Only then might a baquiano no longer be a baquiano but a mediator between the spirits of nature and the speleologists (and anthropologists?) eager to learn their secrets.

The episode also involved a form of socialization for us newer SVE members. Responding to Galán’s call, as we all did, we strived to align ourselves with a particular ethic of exploration and encounter, whether consciously or not. I personally did not grasp the weight of Galán’s concern until after lengthy conversations with him and other SVE explorers who had repeatedly visited the karst of the region with their baquiano counterparts. The event also illustrated the capacity of some SVE members to impose their will by the weight of their character, despite the “horizontal” and “democratic” ethos of *la Sociedad*.

Three hours into the hike we reached the mouth of what we would call *Alto de la Palencia Sima 1*, following the naming rules that the Society had been following since the early 1970s.²⁷ The mouth of this *sima* (vertical cave) was imposing, a crack in the earth's surface longer than it was wide that quickly swallowed daylight in its rocky throat. Evidence of baquiano’s earlier exploration lay at the lip of the shaft's opening: we found an *empalizada*, a set of horizontal logs, about 3 to 4 meters in length, held by two other logs staked into the ground at either end. Expert guácharo hunters tie long ropes made of

²⁷ See Chapter 3.

a naturally fibrous plant (bejucos) to climb down and fetch young oilbirds from their nests along the inner cave walls. Often they explore further in, beyond the birds' nests.

Galán swiftly began the preparations for the descent. Purpose driven and silent, he picked up a large branch from the ground and threw it into the pit. The time it took for it to hit the ground confirmed we were staring into a deep cave. Startled guácharos made cackled loudly. Leaning over the edge I could see dozens of birds flying below. One of them slowly made its way up, defying the bright midday sun, and flew away from the cave entrance. Galán had already moved on to secure the climbing rope on a sturdy tree at the lip of the pit. For Astort, however, the tree was too close to the edge for comfort. "Carlos, let's attach a second security rope to another tree," but Galán did not deem that necessary. Astort stated plainly that that's how many caving accidents happen, confidence in one's skill leading to careless disregard for basic prevention. But Galán did not budge. Still, Astort and Herrera attached an extension of the rope to a second more firmly rooted tree, creating a loop where they could clip their own security rope while they attached their descent gear onto the main descent rope. On they went, Galán leading the way.

Rodríguez walked along the perimeter of the pit trying to find a spot where she could get a good GPS reading, but struggled due to the dense vegetation above us. The rest of walked around the area, seeing what we could find. No more than 10 meters from the lower lip of the larger entrance was another pit, about 2 meters in diameter, also covered with vegetation. Ríos cleared the area with his machete. Astort and Galán descended this pit as well. Although they could not physically connect this second pith with the much larger volume of the first, they could see light shining through a chimney. A simple surface measurement between the first and second mouths, and they could

approximate the length of that chimney, adding to the total distance of the cave system. As soon as Astort, Galán, and Herrera were all on the surface, Galán lit his cigarette and began sketching a plan and profile view of the cave in his field notebook. I watched him work closely, amazed at his swiftness, his ability to fiddle and project complex volumes in his head, that he would then define on paper and even further refine in a computer drafting application at proper scale. In his sketch he made note of the spot from where they collected a geological sample for geologist and fellow SVE member Franco Urbani to identify and analyze, as well as a spot where Herrera eyed a peculiar looking crab. Both samples were properly stowed away in bags and canisters.

From the two mouths of the *Alto de la Palencia Sima 1*, we walked downhill to another large cave pit entrance. This would be *Alto de la Palencia Sima 2*. The procedures to prepare for its explorations quickly picked up, Galán defining the pace of work. Log thrown. Guácharos disturbed. Rope rigged (at a more secure spot than in the previous cave), speleologists connected to the rope, and descended into darkness.

Astort opted to stay on the surface this time while Galán and Herrera explored and surveyed *Sima 2*. Us less experienced onlookers promptly came up with something to do. At *Sima 1* we practiced rope knots. At *Sima 2* we practiced our survey skills. Rodríguez, Acosta, and I made a survey team. Our goal was to establish the relative location of the entrances of *Sima 2* and *Sima 1*. This could be useful data when constructing the scale maps of the two systems. Perhaps they connected underground? Acosta was the tape leader. Rodríguez held the other end of the tape and the measuring tools: the compass and the clinometer. I was the scout, helping along the sides by approximating the lateral distances at each “survey” station, as well as the one writing down the measurements and

sketching the landscape. Astort was our willing and patient teacher. He guided Rodríguez with the placement and reading of her equipment (Fig. 6.3). Acosta too got suggestions as to where to stand and how to select the next stations. A bit rusty since it had been 4 years since my cave surveying class in Kentucky, I tried to remember which were the data columns I needed defined on paper. Station number, orientation, clino, left (in meters), right (in meters)... I quickly drew the columns. I was only to sketch a plan view of our survey, a view from the top, but my sketching often included some form of projection, of depth. I also got caught up with making it pretty. This might be forgivable given our relaxed working conditions. But in a cave that is wet and cold, after hours of exploration, the team relies on both the accuracy *and* swiftness of the sketcher.

As soon as Galán was out of *Sima 2*, he again lit his cigarette and sketched (Fig. 6.4). I realized that he did so mostly by memory, at least in these smaller and less complex caves. In fact, vertical shafts lend themselves to use the climbing rope as measuring tape. Stations are marked on the rope with a knot. Cavers then measure the distances between knots on the surface.²⁸

The last stop of the day was what would become *Alto de la Palencia Sima 3*. A much smaller looking pit, Maribel and I convinced the group that we wanted to lead the exploration. After a brief refresher in rappelling and ascending techniques, I connected my harness and rappel rack to the rope, leaned back towards the edge of the pit, and began my descent. Overcome by a mix of excitement and nervousness, my heart rate

²⁸ Ever the efficient speleologist, I would learn a couple of weeks later how Galán transposes his field notes onto the computer screen using the vector-based illustration software Freehand. His technique was full of swift tricks, avoiding unnecessary mathematical conversions or calculations. He stressed the need to consider what the map will be used for, how it will appear in final form. Too much detail in a map that will be reduced to 50% of its size will result in a blurry mess. It would communicate nothing.

increased and muscles twitched. Here I was, going down into a cave that most probably no other human being had ever entered. Might this pit lead to a long subterranean passage? It had happened many times before in these mountains.

I looked up, my friends' faces about 12 meters above me. As I approached the bottom of the pit, my friend Francisco cautioned, "Mari, watch for snakes." Holding the rope tightly to my right outer thigh, in "break" position, I looked down. The bottom of the pit looked dark and unwelcoming, not because of lack of light, but because of the wetness of organic debris collecting on the crevasse's floor. I imagined snakes in free-fall, torrents of gushing rainwater pushing them off the edge of the pit, down there, caught, waiting for a bigger pray, hungry. As my boots touched bottom, they sunk a few centimeters, the earth softly giving way to my weight. I looked around, and not daring take a step anywhere, I quickly disengaged from the rope and called out "Libre!" (Off rope!). Francisco continued to coach me along: "Mari, you can take this time to look around to see if you can find any leads." Right. I moved very slowly, eyes glued to the ground. I was scared. There was the beginning of a dark passage along one edge of the pit. A speleologist would not hesitate to drop to his hands and knees and crawl in. But frankly, I was eager to pass along the honor to Maribel. "Any big leads?" Francisco called out again. "Still looking!" I was trying to buy time. Finally, Maribel made it to the bottom of the pit, and eager to continue exploring, went down the hole, which ended up extending only a few meters before petering out. By the time we climbed out of the pit, it was almost dark. We quickly picked up our pace behind Ríos and Matos who guided us to our camping site for the night.

The very brief exploration of *Sima 3* was the last of this trip in the Alto de la Palencia. Galán would have had it otherwise. Four days of intense hiking with heavy backpacks were starting to take a toll. There was hope that during the return we would deviate northward to find a cave that Ríos mentioned was worth visiting, but that the SVE may have never surveyed. Yet, when we reached the point to decide whether or not to head to this cave, several people complained that they were too tired. The deviation would add at least two more camping nights, exceeding the days the original excursion had been planned for. Food was running low. Why not leave this cave lead pending for a future expedition? Galán vehemently disagreed. "I did not come here to massage my balls," he said. "This is a speleological expedition, not a tourist excursion." Francisco Herrera, who had been caving with Galán for two decades, and was, though not explicitly, the de facto expedition leader, tried to reason with him, but to no avail. Upset, Galán, along with his wife, decided to abandon the group, and hike that very evening back to the cars. Exhausted, the rest of us set up camp for the night nearby, and did not join up with the couple again until the next day. The discussion of the previous night was not mentioned again.

These descriptions of events that transpired during the 2002 and 2008 SVE Monagas expeditions broaden and deepen our understanding of speleological practice. Specifically, they open up speleology's inherent quality as both a sporting and scientific pursuit and reveal them as inseparable, in constant negotiations that forge identities in/of the landscape. In the context of the SVE's explorations of the Monagas karst, this quality is revealed as dynamic and shifting. Unlike the Sarah Cant's analysis of British speleologists who divided up between the scientific and non-scientific camps (2006),

their Venezuelan counterparts are neither one nor the other, but instead embody speleology's duality in different ways at different times depending on context. To be sure, the SVE has counted on the membership of those that had academic careers in the sciences and those that did not (see Chapter 3). However, in the context of *practice*, these categorical identities do not map directly (or even consistently over time) onto either speleology as a sporting pursuit or speleology as a science. SVE founder Juan Antonio Tronchoni, an insurance agent by profession, was one of the biggest promoters of the Society's identity as a scientific organization. In an effort to do this early on in the group's history, he rejected *espeleismo*, cave exploration devoid of scientific aims. Years later, aware of the difficulty to attract and retain new SVE members, he welcomed so-called *espeleistas* into the group, and hoped that fellow SVE members would do the same. His concern was not just about the longevity of the organization, but for the productive practice of speleology *as a field that requires both sporting and scientific efforts*. Pérez and Zapata plunging into Bastimento 1 Cave's deep pool was sports, in terms of physical effort, risk, team-work, even performance as both men measured each other's capacity to push onward both to the cave *and to each other*). It also was science in that they aimed to reveal the cave and survey it along the way. The national cadastral project, in turn, informed and motivated the survey. Carlos Galán, a trained biologist and only SVE member to practice speleology as a career was fastidious about guarding the group's scientific identity, while at the same time embodying a stoic athleticism to the extreme. Along with Galán in the field, newer SVE members learned both implicit and explicit social norms. Whether or not we embraced them beyond the hills of Monagas would determine the future not just of speleological practice but of *la Sociedad*.

But whose ideal of *la Sociedad* must be addressed. Dynamics in the field also reflect diverse perceptions of the group's identity. To Francisco Herrera, sharing with friends and forging new friendships in common pursuits is a critical part of speleology. To him, Galán's impatience at the end of the 2008 Monagas expedition was unreasonable. "We are who we are," he stated simply, with a shrug, accepting the fact that on that outing, most participants could not match Galán's physical condition or exploratory experience.

In the Monagas karst, forging new relationships extends to the expert indigenous and mestizo baquianos who have and continue to play a critical role in speleological success. Recalling Galán and Pérez's description of how they won the respect of men such as Domingo Maita and José Zapata, we might better understand Galán's concern during the 2008 expedition. To follow a baquiano's pace, swiftly and in silence, to exhibit exceptional physical endurance and mental determination to explore, might help forge relations of mutual recognition and respect. This in turn, might help dispel stereotypes of urbanite eco-tourists, or worse, "soft" naturalists exploring and collecting specimens in the shadow of their imperial counterparts of a century ago.

We must ask, however, whether or not there might be other ways of forging these relations of mutual recognition and respect. One evening during the 2008 expedition, Maribel sought out Ríos to invite him to have dinner with us. The following day Ríos shared with the group a bird he had hunted overnight. Another evening Juan surprised Maribel with a makeshift cake, topped with a candle, and a small bottle of rum, to celebrate her birthday. Again Ríos was invited to join us. In fact, all along the hike, Juan continuously offered candy and other snacks to everybody. This led to gratitude and half-jokes that judged a practice that breached expedition protocol: minimalism and self-

sufficiency when it came to packing, avoiding unnecessary weight. Fortunately for Juan, his capacity to keep up with the swifter hikers despite the extra load, spared him from more cutting critique, and even won him Galán's sympathy. At one point he commented not only on Juan's extraordinary strength and jovial disposition, but also on the remarkable fact that a man of his background could be a welcomed part of the SVE scientific project.²⁹

I end this analysis with by reiterating some of its glaring limits. Baquianos' own voice is lacking, as is a more thorough study of their lives outside of the Society's expeditions. I note that the 2008 expedition was the first in the group's history with equal numbers of men and women, and yet, I do not develop the topic of gender relations. Finally, I must emphasize my awareness of individuals' deeply complex lives and inner worlds that change through time, some of their qualities as hidden as the deepest caves of the Monagas karst. On this point I close with Galán. A 1999 letter from Spain that he wrote to Urbani, in anticipation of a trip to Venezuela to the Perijá Range, stands out from the rest of his years of correspondence for its more informal and sentimental tone. He shares with Urbani some of the travails of getting older (he turned 50 that year):

And so we may have to start to think about easier outings [salidas suaves] and more calm activities, because if not now, sooner or later it will catch up with us. And I also think that we have to enjoy a little, now that we can, because not all of life needs to be work to the maximum. Still I think that mountain expeditions as well as intellectual work are activities that can be effectively maintained until well advanced age, adjusting the rhythm according to the circumstances and the capacity of the organism. I recall—with admiration—the capacity of Domingo Maita (who was easily beyond his 70 years) or the more recent and closer example of my late grandfather, who would go out hunting until he was 92 and that beyond his 80 years he would take good day-long walks in the wilderness. In other

²⁹ As I note in Chapter 3, Juan Acosta was the least formally educated participant of the expedition.

words, by maintaining a certain level of training (and with the tricks of experience) we have a long ways to go [aún nos queda para rato].

Conclusion

In this chapter I have focused on the history and practice of speleological engagements in the Monagas karst beyond Guácharo Cave. These engagements are both with the landscape and the expert indigenous trekkers who guided SVE expeditions to caverns ever deeper within the karst frontier. These specific men—Domingo Maita, José Zapata, Pascual Roque, and Miguel Morocoima among them—forged long-term relations with specific SVE members who traveled to Monagas repeatedly to push the boundaries of speleological knowledge. In practice, they also developed and embraced a new ethic of exploration that shunned excess and encouraged extreme athleticism and determination. Their efforts caused rifts within the SVE, while at the same time furthering the group's cadastral project.

Like Sarah (Cant 2006), I also examine speleology's inherent duality as a sporting-scientific pursuit. In the context of the field practices of Venezuelan urbanites in the country's rural regions among its indigenous inhabitants, this duality presents itself as dynamic and complex. Critically, it begs attending to the specific qualities of the landscape in which they develop. I have suggested thinking about speleology itself as a boundary practice in its capacity to bring diverse actors together in practice.

I also invoked the notion of "cultural encounter" to think about the ways SVE-baquiano relations strived to break from an imperial mold of power relations. Here I want to end with an important limit to the speleologists' aspirations of camaraderie, of equal terms of engagement. Despite SVE members' efforts to acknowledge their baquiano

counterparts in their publications, cave maps capture not the “indigenous” view or their relations to that space but the speleologists’. More critically, once produced, published, and circulated, these maps could be used in ways that might impact indigenous livelihoods within the Monagas landscape. Indeed, this has already happened, albeit indirectly.³⁰ In 1975, the National Institute of Parks created the Guácharo National Park to include much of the karst area that the SVE has continued to explore over the years. The impetus driving this decree was the desire to protect guácharo colonies in the region’s caves as well as forests that provide them with food. This Institute also prohibited guácharo bird hunting within the parks boundaries. While these rules have had limited effect on the ways small indigenous and mestizo communities located deep within the forest engage with their environment, the building of roads threatens with greater incursions and policing by the state. Could speleological knowledge serve the objectives of territorial and exploitative interests of either the state or other private enterprises? This is the topic of Chapter 7.

³⁰ Geographer John Short broadens the notion of cartographic encounters to include map-making by both Europeans and Native Americans as a consequence of their “collaborations” (2009:12-13; Malcome Lewis 1998). To Short, a “symbiotic destruction” characterizes the terms of engagement, which involved choices and constraints, compromises and negotiations as well as conflicts and struggles, limitations on Europeans and exercises of Native American power, but set within the long-term story of eventual European victory and Native American defeat (2009:12).

Chapter 7

Territoriality and the Making of Nation

Prior to the 2004 Venezuelan Speleological Society expedition to Roraima, Francisco Herrera, its organizer, obtained the necessary permit from the Caracas office of the National Institute of Parques (INPARQUES). Or so he thought. This expedition required a state approval since its goal was to continue the exploration and survey of a cavern located on the summit of Roraima plateau, itself part of Canaima National Park. The permit granted the group a 5-day stay on the top of Roraima, enough time, Herrera hoped, for the Society to finish its work. After a 12-hour bus trip south into the Amazonas state, we loaded our expedition bags onto the top of a jeep that took us along a bumpy dirt road to the small town of Paraytepu. There, Herrera met with officials of the regional Inparques office that coordinates hiking trips to Roraima. To his great concern, the officials did not honor the original arrangements of the 5-day stay, stating that the SVE had three days instead. They explained that a tourism company was scheduled to take a group of foreign tourists to Roraima on days that overlapped with our visit. (On Roraima, comfortable camping space is at a premium, since there are only a few areas with sandy floors under sizable rock shelters.) Doing his best to not upset the officials, who now effectively held in their hands the fate of our expedition, Herrera emphasized the importance of the Society's work. He noted that its aim was not leisure tourism but

science, lead by Venezuelans dedicated to promoting national geological heritage. He further reasoned that it was unfair that nationals who follow the proper means to obtain permits to visit their own national parks should be made to bow down to the will of profitable tourism companies with foreign customers.

That the expedition had to be cut short to accommodate international tourists added salt to an open wound. This was not out of a xenophobic attitude towards foreigners (this SVE expedition, in fact, counted on the participation of three Spanish and one U.S. caver). At issue was the Society's imperative to finish surveying and publishing the map of what appeared to be an important speleological breakthrough: the longest quartzite cave in the world. Already members of the Slovak Speleological Society and the Czech Speleological Society had been exploring and surveying the same cavern, which they named Crystal Eyes cave (Smida, Audy, and Vlcek 2003). In 2005 the SVE filed a formal complaint to the International Union of Speleology claiming that these cavers had breached international caving ethical standards (SVE 2005). In the words of some SVE members, these Eastern European explorers were committing nothing short of an imperialist affront to Venezuelan speleological sovereignty.

How members of the Venezuelan Speleological Society have interpreted and handled both of these cases, the permit ordeal and the apparent breach of international caving ethics, point to the complex geopolitics of speleological practice. These geopolitics have both national and international dimensions amidst which, I argue, the SVE has aimed both to envision and enact a particular kind of nation. I show that these efforts always assert, whether explicitly or implicitly, the kind of relation citizens ought to have with the national landscape vis-à-vis the state's power to administer and control it

and them. In practice however, the lines between citizen and state often are blurred. This chapter examines some of these blurry boundaries more closely. In counterpoint to the arguments presented in earlier chapters, which present caves as distinct spatial domains hidden from technological and state reach, the Society's national speleological project is revealed here as potentially risky in so far as it could be appropriated by the state for purposes that most Society members might reject both on political and scientific grounds. Are cavers making caves visible for the state? That is a question I consider here, which members of the Venezuelan Speleological Society have asked themselves at different points of the organization's history, with different effects. Here I revisit the 1951 Orinoco Headwaters Expedition (Reig 2006/2007). Rivers as potential sources of scientific, military, and economic value contrast to caves as "empty" volumes. They contain neither land, people, nor resources, which might promote their appropriation and incorporation into either state or capitalist territorial regimes. Beyond the specific case of the SVE, this examination builds on work that counters that prevalent dichotomy in the social and historical studies of cartography that splits mapping as for/by the state/empire or against it.

Yet, like in previous chapters, the qualities of the karst landscape are emphasized in relation to the particular kinds of sociality they engender. Again, the geographies of speleology are shown to have complex and multidimensional spatialities. Their dynamics pervade geological, ecological, and political landscapes that explorers must learn to negotiate in order to practice speleology and explore both the caves, and alternative visions of, the nation.

Beyond State and Capitalist Cartographies

The 1951 Orinoco Headwaters Expedition was publicly celebrated as a commemoration of Humboldt's travels through Venezuelan in 1799. However, as Reig shows, strategic military and economic interests strongly shaped the pace and paths of the expedition (2006/2007). The exploration and later taming of the Orinoco through an ambitious hydroelectricity project, heeded the government's call to create an economic, civic, and cultural infrastructure that materially and symbolically transformed the nation's landscape. Reig takes this event as an important precursor to a series of grand scheme state projects bent on domesticating and exploiting the resources of Venezuela's Guayana, the first of which began during the Marcos Pérez Jiménez dictatorship in the 1950s. Central to his policies was the promotion of the 'New National Ideal,' seeking to create development alternative to oil (Reig 2006/2007:63). Economic development was not the only goal of the expedition, however. Critically, this region of southern Venezuela shares frontier limits with Colombia to the west, and Brazil, and Guyana to the south and east. Increasing state presence in these areas was seen as an important effort in asserting Venezuela's territorial integrity. The political leadership that followed Pérez Jiménez continued to foment his ideal of developing and policing the south, which in the early 1960s took the shape of the Venezuelan Corporation of Guayana (CVG) and the later Commission for the Development of the South (CODESUR). More broadly, these projects must be understood in the context of the Venezuela state's increasing consolidation as the "sovereign landlord over a national territory, as an economic agent with its own base of economic power" (Coronil 1997: 199, 293, 388).

To explore, to demarcate, to populate, to police, to prospect, to exploit, and to represent are all strategies that are part and parcel with a nation-state's efforts to define

its territory. Geographer Robert Sack defines territoriality as "the attempt by an individual or group to affect, influence, and control people, phenomena, and relationships, by delimiting and asserting control over a geographic area" (1986:19). The map—a visual representation that presents the territory as as a united whole—plays a key role in the definition of and how not just a nation-state, but also a colony or empire enact and imagine their power over nature and its subjects (Anderson 1999; Burnett 2000; Carter 1999; Edney 1999; Winichakul 1994). Critical in the capacity of cartographic representations to become associated with a distinct imperial or nationalist character is the definition and location of landmarks (Burnett 2000; Craib 2004; Olwig 2002). As the case of the 1951 Orinoco Expedition illustrates, to define and locate these landmarks requires geographical knowledge of the territory. Obtaining this knowledge, in turn, necessitates a systematic project the coordination and execution of which has and continues to be the domain of state (or colonial) institutions (Carneiro 2005; Scott 1998). These projects typically have involved people and tools in the field surveying the landscape, but increasingly during the 20th century, technologies such as aerial photography or satellite imagery have been aided or even replaced some (and sometimes all) aspects of these activities.

Scientific, political, military, and economic motives comingled within the 1951 Orinoco Expedition, all of them amplified by the river's status as a powerful national icon. For Venezuelans to explore and define its origins would augment its iconic appeal.¹ The river's proper measurements would translate, at least in theory, to the effective territorialization of the region, setting up the stage for greater militarization and

¹ As Reig notes, there was a concerted effort to expel the French counterparts of the mission in order to "nationalize" the enterprise (2006/2007:59).

exploitation of the region. However, only the *fiction* of the first was necessary to achieve the intended goals. As Reig notes, systematic hydrological measurements upriver were never made. Had they been done, they would have placed the Orinoco's origins beyond Venezuelan borders and in the Colombian Andes. Thus, "[r]ather than *discovering* [the main sources of the Orinoco], the expedition *established* [them] politically ... based on historical tradition and the geo-strategic need to situate, within Venezuelan borders, the birth of the country's major river" (Reig 2006/2007:59-60).

Throughout the expedition, economic goals were furthered as well. One of the hired workers (Delfin Acosta) was assigned with prospecting for gold in the riverbeds of all the creeks they passed up. At one point a bauxite seam was discovered, with the expedition scientists claiming its private ownership. As Reig notes, "[i]n a state-funded expedition, this resonates with the lack of distinction between private and profit in the initial days of the Venezuelan Republic, concerning the exploitation of rubber, timber and mining resources in Amazonas" (2006/2007:62). Beyond the Orinoco itself, the aim of revealing the rivers of southern Venezuela responded to a state-sponsored plan of domesticating, integrating, and exploiting the Venezuelan Amazon for its mineral and hydraulic wealth. In other words, exploring rivers contributed to the state territorial strategies that further objectified and exploited nature as source of wealth (Coronil 1997; Reig 2006/2007).

In contrast to rivers, caves hardly held any strategic scientific, political, or economic appeal to either state or capitalist enterprises. Speleology, I argue, did not align itself with the developmentalist and modernizing script that promoted other sciences such as chemistry (for the oil industry) or even zoology (for agriculture) (Texera Arnal 2003).

With the exception of Guácharo Cave, which stands out as the nation's first natural monument for reasons I describe in Chapter 2, caverns in general remain relatively invisible to the broader national imaginary as well, not just to state or capitalist interests. This fact is particularly interesting in the context of Venezuela, where oil and its derived wealth are crucial factors in the shaping of national realities and imaginaries (Coronil 1997; De Lisio 2005). In fact, the leadership of the Speleology Section of the Venezuelan Society of Natural Sciences hoped to appeal to state officials and the public at large by presenting caves as an extension of Venezuela's rich subsoil patrimony. This was and remains true in the technical sense: as part of the nation's underground, caverns *are* national patrimony. In contrast to places like the United States, where a private owner's topsoil rights extend to the underground, in Venezuela they are only surface-deep. This fact has far-reaching implications on the practice of speleology, as explorers attempt to navigate and at times circumvent what are effectively complex property regimes with greater or lesser powerful agents to exert their territorial claims.

Yet, the maps of over 700 caverns are accessible to anyone who wishes to seek them out. While the act of mapmaking *itself* may not involve appropriation of the surveyed space, the National Speleological Cadastre provides knowledge that could lead to territorial claims. I turn to one of these examples.

Caves as Spaces of Subversion/State Control?

Caves played a critical role in securing victory for the Cuban Revolution. Counting with the support of Antonio Nuñez Jiménez, the country's premier geographer and speleologist, Fidel Castro, Ernesto "Che" Guevara, and other key leaders of the uprising

several times hid in caves along the Sierra Maestra to regain energies and plan attacks (Forti 1998). Sensitive to this fact, the Venezuelan military, which faced its own guerrilla threat, requested cave information from the Speleology Section during the 1950s and 1960s. Long time SE and then SVE member Carlos Tinoco recalls that:

We used [our cave information archive] to plan outings and our results were added to it, with the drafts of maps, notes on access routes, etc. This was during the time of guerrillas and the military requested that we pass on to them all of this available information, because there were several incidents (such as Toro Cave in Falcón State, the Goering caves in Monagas, and in [the region of] Las Peonías in Lara) where [guerrilla fighters] were hiding and had camps [in caves]. Every time we traveled [on an excursion] we had to check in with the Ministry of Defense (in La Planicie), and there we were informed about which Operations Center [Teatro de Operaciones, or T.O.] we had to report to upon our arrival. [Tinoco, Personal Communication, May 26, 2010]

Preliminary research suggests that after the guerrilla threat was eradicated in Venezuela by the late 1960s, the military did not pursue a formal agenda of underground surveillance in the country. In a sense, it did not need to. If anyone ever stressed the importance of knowing the location of caves suitable for guerrilla activity, he or she might have realized that Venezuelan speleologists were already amassing this information. Are there any traces of cave maps in military archives? Was the National Speleological Cadastre ever considered of valuable strategic importance? These questions require further research. Yet, it appears that the initiative of systematically exploring, surveying, and cataloguing all of the caves in the country was not of interest to state cartographic or geographic institutions. Even today, the *Instituto Geográfico de Venezuela Simón Bolívar* (formerly Cartografía Nacional) has no information about the location of caves within the national territory, although it does feature thematic maps of other geological and demographic features such as rivers, mountains, and population

distribution. Geological maps produced in the early 1970s by Ministry of Mines and Hydrocarbons pinpoint general distribution and location of limestone rock, which is most prone to contain caves, but caves themselves are absent in such graphics (Menéndez 1972). In a 2008 visit to the main offices of the *Instituto Nacional de Parques* (National Institute of Parks) in Caracas, the then coordinator of geographic systems demonstrated the latest computer information system that graphically represented the country's national parks and highlighted its geographic features and boundaries. He opened the files of El Guácharo National Park, but although this park contains many caverns, the information system only marked with a point in space the entrance of Guácharo Cave.

While this question requires much closer inspection and research, I will entertain for a moment some of the reasons why in Venezuela caves did not become the crucial havens for the guerrilla that they were for their Cuban counterparts. The short answer is that they did not count with the support of an Antonio Nuñez Jiménez who could provide them with key speleological knowledge and skills that would have enabled them to effectively navigate the Venezuelan karst landscape. Yet, efforts were made. As Carlos Tinoco recalled, guerrilla fighters made some of the caverns in the karst region of Sorte, in northwestern Venezuela, a makeshift center of operations. The caves in this region, however, are hardly secret since they are widely known and visited by santeros and people who worship the cult of Maria Lionza (Perera 1988). Not only did the Venezuelan guerrilla not have any cartographic knowledge of the precise locations and sizes of other caverns in the country, neither did the Cuban guerrillas who made a clandestine entry into Venezuela in May 1967 (SVE member Miguel Angel Perera recalled that this occurred barely one week prior to a Society expedition to the coastal region of Chichiriviche, just

north of the Sorte mountains). Even if either the guerrilla nationals or Cubans had had contact and support from Venezuelan speleologists, timing worked against them: by the time these individuals planned their subversive activities, comprehensive cadastral work by the Venezuelan Speleological Society was just beginning.

In fact, Cuban speleologists did have contact with their Venezuelan counterparts beginning in the early 1950s. Recognizing Antonio Nuñez Jiménez as a pioneer in Latin American speleology and eventually, the Cuban Speleological Society as one of the premier organizations of its kind in the continent, Speleology Section founders de Bellard and Tronchoni sought formal correspondence (and presumably, recognition) from their Caribbean colleagues. Indeed, Antonio Núñez Jiménez was listed as international collaborator for both the Speleology Section and the Venezuelan Speleological Society. For de Bellard and Tronchoni, however, this liaison was a scientific and not a political one, and any efforts to meddle with this distinction was viewed as problematic. Tinoco recalls that as director of the Speleology Section, de Bellard received a package from Cuba that led to a cooling of relations between the Section and the Cuban counterparts. The package contained a copy of Antonio Núñez Jiménez's recently published *Geography of Cuba* (1954), a text that, as Tinoco described it, alarmed the conservative de Bellard. Along with the book was a letter from Antonio Núñez Jiménez requesting information on Venezuelan caves. In Tinoco's words,

this letter really caught my attention because it was written on very rough paper, like a piece of brown paper bag, perhaps this was a sign that the Cubans were starting to experience a shortage of basic goods. De Bellard became very agitated by this letter, which he quickly destroyed since he did not want to have any material evidence that could incriminate him as Cuban and guerrilla loyalist, as somehow wanted to help their cause. [Personal Communication, April 21, 2011]

Under Tronchoni's leadership, the Venezuelan Speleological Society continued its correspondence with Jiménez. The Cuban Speleological Society began to receive copies of the *Boletín de la Sociedad Venezolana de Espeleología*. This publication also featured Cuban speleological research. By then, however, the ambitions of a revolution on Venezuelan soil, using its karst as key sites of subversion, had been abandoned. Likewise on the Venezuelan side: When the Society began to work with the printing house of the Universidad Central de Venezuela, its coordinator sighed when he saw the quality of maps and the descriptions of caverns featuring in the cadastral section of the publication. "If only we had had this information when we were deep in the guerrilla..." SVE Miguel Angel Perera recalls him saying (Perera, Personal Communication, May 2, 2011).

Surveying and Accessing the Venezuelan Cavescape: Speleological Collaborations with the State

In its effort to locate and map all of the country's caverns, the SVE's cadastral project echoes the territorial ambitions of a state dedicated to the definition of its geographic domain and the identification of its resources contained therein. This ambition has not been the preoccupation solely of the state. Indeed, prior to the wave of nationalizations that sought for the state the ownership (or at least, a bigger hand in setting the conditions of administration) of its natural resources, private companies invested heavily in revealing hidden riches underground (Coronil 1997; Reig 2006/2007). With the hiring of geologists and engineers, companies such as Standard Oil's subsidiary company Creole produced a wealth of information based on their prospecting and cartographic interests and capabilities. Some of this information became invaluable for Venezuelan speleologists. Some of Creole's geological maps, produced in the 1950s, note the location

and extent of exposed limestone, the soluble rock with the greatest cave potential. During his tenure as a geology professor in the Universidad Central de Venezuela, long time SVE member Franco Urbani scanned all of the Creole maps and has made them available to the SVE, along with many of the country's geologists still doing work today.

In fact, the Society's work benefitted from other state-sponsored geological and military projects. These benefits grew from social networks among some of the group's members and individuals working in these projects, effectively blurring distinctions between the state and civil society. Urbani recalled a visit to Cartografía Nacional in the late 1960s, a time when national cartographic knowledge was still classified information. Through the personal workings of Juan Antonio Tronchoni, who befriended the institute's director Dr. Adolfo Romero, they obtained a donation of all relevant topographical maps (personal communication, September 6, 2009). To the south of the country, which features the geologically distinctive Roraima Formation, with its characteristic flat-top mountains or tepuyes, aerial reconnaissance provided important clues of where caves and large vertical pits might be located. Moreover, getting to many of these places would be virtually impossible without a helicopter or small plane.

Throughout the years the SVE managed to carry out explorations of various scales to this region thanks to the personal friendships with people working within Guayana state institutions. In the 1970s, Urbani, who studied and then taught geology in the Central University of Venezuela, was able to collaborate with old classmates such as Eugenio Szczerban and Pablo Colvee who worked for CODESUR on research of cave formation in pseudokarst located in Amazonas and Bolívar states (Szczerban and Urbani 1974). Indeed, Urbani furthered his contacts by providing geological studies of potential

sites of hydrological dam construction in the region of Caura river basin (Urbani 1977:75). Also key to several expeditions in Guayana was the personal contacts with individuals working for the Frontiers Commission who supported reconnaissance flights and transportation to several plateaus. In the mid to late 1970s SVE member Wilmer Pérez worked as a medical doctor for such a Commission, and took advantage of work along the Venezuelan-Brazilian border to scout out caves. In the heavily forested regions of Urutany, he was tipped off by the presence of nearby caves by the sounds of guacharos. Finally, friendships with individuals working for the Forestry Division of the state-run electricity company EDELCA, provided key access to helicopter flights during the 1980s. Even in the cases of aerial reconnaissance providing tips to the mouths of dark pits gaping towards the sky, cavers still had to reach these entrances, explore, and survey them on foot. In fact, many of the imposing pits of the Roraima region demanded rock climbing techniques, such as in the case of Sima Aonda with -383 meters in depth.

These examples illustrate that while speleology did not directly align itself with the state and/or capitalist territorial practices, indirectly it did benefit from them. Also through personal contacts of other SVE founding members, such as Marcos Sandoval, who worked at the *Cancillería*, the SVE gained transportation support from the *Fuerza Aérea Venezolana* to travel to the Perijá range in 1973 by helicopter (SVE 1973b). The SVE also was able to obtain aerial photographs of the Perijá region, thus defining potential exploration sites: if rivers seemingly disappeared from the surface, only to reemerge at another point, and if the area is limestone-rich, then the potential for caves was high. This was the case of the Guasare River, its subterranean portion containing a number of significant caves, all of which have since been added to the cadastre. Yet, such

aerial support was more the exception than the norm. As soon as the SVE members with these contacts dropped out of the organization, or personal connections vanished with changing jobs, then these opportunities vanished as well. Most explorations required SVE members working out who could volunteer their own cars, and making calculations of how many people and how much equipment would fit given the available vehicles. This is still a difficulty today, especially given the concern of where to leave the car, given the constant real danger of theft.

Speleological exploration in other regions of Venezuela depended on the support of individuals deeply knowledgeable of their landscape. I have already described the case of northern Monagas, where the guidance and support of expert Chaima trekkers has been fundamental for the Society's capacity to explore and survey the caves of the region.²

What these cases emphasize is the Society's own need for both geographical information and logistical support to traverse the landscape. Only by effectively maneuvering this *horizontal* traverse could they even begin their *vertical* explorations underground. This grants the national speleological project a territorial hue. It also emphasizes the complexities of speleological exploration as it attempts to traverse a landscape where various actors have staked their claim.

State and Civil Territoriality and Speleological Practice

The eagerness of some of the Society's old timers to gain visibility and even collaborate with state enterprises cooled by the late 1970s. By then, the younger generation of cavers was taking on leadership roles within the group. Several of them also identified with a

² See Chapter 1 for references to SVE studies of other regions in Venezuela where caves are actively used as sites of ritual, such as in the states of Lara, Falcón, Yaracuy, Guárico, and Zulia.

different set of political views that grew suspicious of and even rejected the state's bureaucratic and policing activities that encroached on the group's capacity to explore the national territory and survey its caves. Even Tronchoni grew increasingly pessimistic about official recognition and support of the Society's speleological endeavors. In a *Boletín* editorial he laments the difficulty of finding support to publish the work of the Society in "our country rich, generous, and splendid, receptive to all kinds of innovation, idea or modality, regardless of how frivolous or costly it may be" (Tronchoni 1969:3). To him, this lack of support was doubly frustrating because it spoke to the misguided morality of the national society as a whole that did not value "the patient and steady work of a group of young men, most of them university students, dedicated team members, without desires of personal aggrandizement and dedicated to the work of exploration, research, and promotion of our vast underground world" (Tronchoni 1969:3).

Not only was the Society unable to gain the official recognition and support for its work, it increasingly had to navigate the bureaucracies of INPARQUES, the National Institute of Parks. On the one hand, the creation of this institute was celebrated as evidence of the governments' commitment to the creation and conservation of national parks. On the other, it was cursed for the circuitous paths it set in order to receive permits for research in its administered territories.

As the case of the 2004 Roraima expedition illustrates, having a permit in hand hardly was a guarantee of its validity and effectiveness. Herrera's commitment to follow the rules and the frustration when his efforts backfired must be understood in contrast to other Society members who in the past have scoffed at the need to get permits at all. Indeed, the group has repeatedly carried out expeditions in the El Guácharo National Park

or the region of Perijá under the radar of state bureaucracies. To Herrera this reflects the arrogance and iconoclasm that has sometimes characterized the group, or at least some of its key members who, in his words, “imposed their leadership with their personalities.” “It is like the people who drive along the service lane of highways [something that is very common in Venezuela] to get ahead ... that attitude that you are above the state ... there has been a lot of this in the group,” he opined (Herrera, Personal Communication, August 12, 2011). He is not alone to make this assessment. I read both positions towards state bureaucracies as idealizations of the proper relation between civilians and the state. More specifically, these idealizations concern civilians’ capacity to set the terms of their own engagements with the landscape, regardless of state territorial claims on it. Again, these dynamics emphasize the broader *political* geographies of speleological practice beyond the caves themselves. In order to get *in* caves, one has to move *across* the territory to get to them.

Of course, the state is not the only actor to place limits on the Society’s capacity to traverse the landscape in search for caves. Private owners who have on their land, sometimes without their knowledge, entrance to caverns effectively own the entrance if not the cave itself. Other times small rural communities act as the guardians of nearby caverns. In these cases, the strategy that the Society has opted to pursue is one based on transparency, communication, and sometimes collaboration.

For some of the newer members of the Society, these terms of engagement are a source of optimism for the future of speleological practice, and perhaps even, Venezuela. Such was the perception I got from Maribel Ramos. “We have been thinking about you a

lot, we wish you were here," Maribel told me on the phone just a week prior to Holy Week 2011. "The Society is entering a new phase," she continued enthusiastically. During the last few expeditions, one to Sucre and the other to Monagas state, the group established a unique relationship with the communities living in the vicinity of the caverns explored and surveyed. In the town of Fuente de Lourdes (Sucre) seven people from the community joined them into the cave, with some eager to learn how to survey. People's homes were offered for the night. In the town of Río Chiquitico (Monagas) they were invited out to eat at a local restaurant. The leaders of the community asked the cavers to give talks about speleology. "We gave them information about their cave, and emphasized it was theirs to conserve, and, in the case of Río Chiquitico, perhaps even use to attract tourists," Maribel continued. To Maribel, speleological knowledge should not be limited to the scientific agenda of the Society, but should be made useful to those who live on or near karst.

A few others in the Society's history have shared this sentiment, most notably Juan Antonio Tronchoni. He envisioned a speleological institute in Caracas that would house both the SVE and a speleological museum open to the public. He purchased a piece of land in the town of Caripe with the idea of building a regional speleological center. Neither of these ideas ever materialized. He was both doer and promoter of speleological education, particularly in schools. This, he believed, would get youth excited about caves and science in general. Such efforts would also help recruit new Society members, ensuring the national speleological project's longevity and growth. Even more critically, caves would be better understood as critical geological and ecological spaces, many of them connected to some of the country's aquifers, and perhaps even appreciated and

conserved. In these ways as well, members of the Venezuelan Speleological Society have imagined alternative relations between civilians and national geographies, relations that circumvent the state altogether and instead seek the growth and participation of the public sphere (Habermas, Lennox, and Lennox 1974) in the recognition, management, and responsibility towards the nation's nature.

A Broader Geopolitics of Speleology

Unlike many ordinary places, territories require constant effort to establish and maintain. They are the result of strategies to affect, influence, and control people, phenomena, and relationships. Circumscribing things in space, or on a map, as when a geographer delimits an area to illustrate where corn is grown, or where industry is concentrated, identifies places, areas, or regions in an ordinary sense, but does not by itself create a territory. This delimitation becomes a territory only when its boundaries are used to affect behavior by controlling access. [Sack 1986:19]

On the one hand, the cadastral project, whereby caves are located, explored, surveyed, and mapped merely circumscribes and delimits, not an area, but a volume underground. In no way does this action lead to a claim of ownership and authority over its existence and content. In this sense, the Society's cartographic efforts are not territorial, according to Sack's definition (1986:19). On the other, there are ways in which these efforts *do* gain a territorial tinge. Appreciating this fact requires understanding the broader geopolitics of speleology.

In his welcome message to the 15th International Congress of Speleology, UIS president Andy Eavis remarks that

Cave exploration is now going on all over the globe, with many new areas being visited. Suggestions 30 years ago that there were no caves in the Himalayas have long since been superseded. Africa and South America are new frontiers with relatively small numbers of caves so far explored. [...] Probably no more than ten percent of the caves in the world have

been explored and only a fraction of the potential cave science accomplished. [Eavis 2009]

Through this optic, the caves that to state or capitalist enterprises might hold no immediate appeal, suddenly become very attractive. For those seeking unexplored or “virgin” passages, a “resource” harder to come by in countries with longer speleological traditions, Africa, South America, and Asia hold extraordinary promise of discovery. Moreover, as SVE member Rafael Carreño notes in a essay on speleological sovereignty, these regions’ underground spaces are also teeming with unidentified species and minerals (Carreño 2004). What to those with no speleological sensibility might just be empty voids, for others they are a treasure waiting to be tapped and even, exploited.

At this International Congress, held in Texas in July 2009, over 1,500 cavers from over 50 countries exchanged reports and images of their latest exploratory and scientific accomplishments. Most of them practice caving as a hobby through affiliations with their local or regional caving clubs. Few (although this number is increasing) have been able to incorporate caving into their careers, such as the case of geologists, hydrologists, and biologists who have specialized in speleological research, despite the fact that speleology has failed to claim its place as an academic science within most universities and research centers worldwide. In virtually all cases, cavers themselves manage the speleological data they themselves produce, mostly of a particular region of the country in which they reside, although a smaller number travel abroad to explore and map caves at international sites. Precisely under what conditions international caving efforts take place and what happens to the resulting speleological data are topics that have been and continue to be debated among cavers. In 1997, at the 12th International Congress of Speleology, the UIS General Assembly approved the "UIS Code of Ethics for Cave Exploration and Science

in Foreign Countries," with subsequent amendments made in the following international congress in Brazil in 2001. These amendments reflect a preoccupation, particularly from cavers of "countries of lower speleological development" to hold UIS Bureau Members and National Delegates more accountable for the activities of their caving community from "countries of high speleological development." The amendments also call for a reduction of this gap of "speleological development" among nations. Point 5.c. reads: "For expeditions organized by countries of high speleological development to countries of lower speleological development, the expedition group shall do its best to offer the transfer of knowledge and to promote local speleological activity" (UIS 2009).

Five years later, at the 14th International Congress of Speleology, tensions ran high regarding several presumed violations of the UIS Code of Ethics. One of the debates involved Venezuela, whose national speleological organization, the Sociedad Venezolana de Espeleología (SVE), argued that cavers from Slovakia and the Czech Republic had violated the Code of Ethics with their expedition to and resulting publications of a cave located within the quartzite walls of Roraima Plateau (SVE 2005; Urbani 2006). As of this writing, this issue has not been resolved. This ongoing debate reflects the concern among many that, with its Code of Ethics, the UIS only makes a recommendation of proper practice. There is no structure set up to hold presumed violators accountable for their actions.

Beyond the specifics of the Roraima Sur Cave lies a broader and familiar pattern that questions the barrier-less global imaginary that UIS President Eavis evokes in his message above. Resource differentials (whether in the form of personal wealth, state support, or access to private exploration and research funds) grants some cavers greater

capacity to travel to less explored regions of the world to carry out exploration, in some cases creating geographies of power that echo a not so distant colonial past. Access (or lack thereof) to passports and visas also hinder or promote (depending on perspective) caver mobility and activity. There is nothing new about this. Cavers everywhere recognize these facts. It is precisely the efforts of organizations such as the UIS to promote ethical (or at minimum, more transparent) practices everywhere. Indeed, it is not just speleological projects that are at stake: so too are communities whose livelihoods are linked in some way to cave ecologies and their surroundings, as well as the conservation of caves themselves.

There are, however, problems with the terms these debates are cast. The cases of caving societies that cohesively and undisputedly represent the speleological efforts of an entire country are few and far between. More typical is the case of several (or many) regional clubs, sometimes loosely organized into a national federation. Efforts to create a national caving society often splinter into more numerous groups, with seemingly irreconcilable differences left in their wake. Sarah Cant's analysis of British speleology is a case in point (2006). Some cavers go solo, preferring no affiliation with any one association, as is in fact the case with a number of Venezuelans who collaborated with the Czech and Slovak societies that the SVE accuses of ethics violations. While the UIS formally works in terms of national delegates and representations, this structure rarely reflects the reality of national speleologies within their home turfs. This fact, in turn, complicates the division of the world into countries of greater and lesser "speleological development." Implicit in these terms is the idea that a caver has a greater right to the caves of his country than a foreigner does. Yet, such territorial claim belies what is

typically a complicated national landscape, with caver nationals themselves sometimes echoing the very inequalities within their countries that they decry at the international scale. Statements defending the so-called "speleological patrimony" can read as intensely parochial, often assuming a national unity that is questioned by nationals and foreigners alike (e.g., Carreño 2004).

Elsewhere I have pointed to some of these inner tensions. The very birth of the Venezuelan Speleological Society was in part the result of the desire to create a space for an alternative model of speleological practice, both within Venezuela and beyond. The debates leading to the definition of the Speleological Cadastre of Venezuela, with its inclusions and exclusions, highlight some of the politics of defining Venezuela's speleological knowledge. Yet, as I have also addressed, these dynamics cannot be understood without regard for speleology as a broader transnational phenomenon. With many speleological groups receiving no formal recognition within academic or state institutions within their own home countries, they turn to each other, beyond national borders, to validate, debate, and support their efforts. Yet, even in this transnational arena, national and regional identities do not disappear, but become reasserted. Indeed, some members of the Venezuelan Speleological Society have led the initiative of creating a Latin American and Caribbean speleological federation.³ Through this organization, the SVE has sought to position itself as a speleological regional player, strengthening its

³ One of the stated goals of producing the *Boletín de la Sociedad Venezolana de Espeleología* was to create a venue for the publication of regional (Latin American and Caribbean) speleology. Breaching this commitment sparked debates within the group about its stated goals as a regional speleological organization. In the spirit of establishing the group's regional influence, SVE member Carlos Bordón's road trip through Latin America in the 1970s was viewed as a success in terms of speleological diplomacy. Together with his wife Nora, Bordón sought caves and cavers in most countries in the continent. These efforts resulted in some long-lasting correspondence.

voice with the support and numbers of its neighbors, while at the same time underscoring its identity at home as *the* national speleological group.

Conclusion

Anthropologist Nancy Peluso was among the first scholars to theorize the impacts of indigenous communities' attempts to assert their claim to their lands by appropriating some of the very cartographic strategies that states use to claim theirs (1995). These indigenous maps, or "counter-maps," become effective tools to challenge the hegemony of typically oppressive states. Similarly, the Venezuelan Speleological Society, with its management of the national cadastral project, has been carrying out, for over 50 years, cartographic activities typically associated with state territorial efforts. Unlike the Indonesian counter-mappers in a fight to lay claim to their forest resources, Society members are not trying to claim caves as their own, away from the grips of a policing state. On the contrary, shortly after its foundation, the group sought recognition and visibility from government officials. The Society aimed to place caves along side other important natural resources, as an important part of Venezuela's subterranean heritage. Their attempts have had little, if any, success.

This earlier attempts for official recognition and support gave way, by the late 1970s, to a growing suspicion and rejection of state bureaucracies and policing strategies that hindered the SVE members' desire to explore the national landscape, survey, and map caverns.

At the same time, the SVE continued to publish its journal, which included the National Speleological Cadastre. Thus, a state official bent on punishing the group's

territorial transgressions or even appropriating its speleological registry for some future use (a future skirmish with yet another guerrilla movement?), need only to seek out this information. Yet, to not publish, to not make public the results of its explorations would threaten the Venezuelan Speleological Society's *raison d'être*. So far, it has benefitted from staying, sometimes literally, under the radar.

Coronil has argued that a defining characteristic of Venezuela's political culture is the view and experience of the nation as constituted by two bodies, "a political body made up of its citizens and a natural body made up of its rich subsoil" and that "[b]y condensing within itself the multiple powers dispersed throughout the nation's two bodies, the state appeared as a single agent endowed with the magical power to remake the nation" (1997:4). I see the speleological cartographic project as an odd case challenging this national anatomy, itself taking up the tools and even some of the ideologies of state cartographic projects and refashioning them to suit its actors' determination to traverse the national landscape, immerse themselves within its hidden crevasses, and produce representations of these spaces, these representations then circulated mostly among an international speleological audience. As such, these practices weave together an alternative cartography, emphasizing not territorial boundaries nor property, but the sociality and movement that the engagement with a peculiar kind of landscape invites, challenges, and engenders.

Chapter 8

Conclusions

During my time in Venezuela, Oscar Garbisu, my father's companion during the 30-day stay in Guácharo Cave, gave me a wonderful gift. As staff of the Cinemateca de la Biblioteca Nacional (the Film Archive of Venezuela's National Library), he located and reproduced for me a copy of a national news cast of that extraordinary event back in 1967. The short clip was played, alongside other national news, in movie theaters all over the country as a preview to feature films.¹ It contains a number of limited views inside of the cave, mostly focused on salient formations. At one point the camera's attention turns to the young speleologists. With an authoritative voice edging on the melodramatic, the narrator declares them the future promise of Venezuelan science, celebrating their efforts in revealing to the country the majesty of its underground natural patrimony.

This clip was valuable evidence of the Venezuelan Speleological Society's early efforts to publicize its work to the broader public. The hope was that such publicity would garner financial support from both public and private sectors. It also reflected the desire to raise public awareness of, and even participation in *national* speleology. Moreover, the film illustrates the difficulty of visually capturing precisely what is so valuable or majestic about the underground. Most shots are confusing contrasts between light and dark, with the silhouettes of stalagmites and stalactites attempting to anchor the

¹ Bolívar Films produced the clip.

viewer onto some recognizable image. Understood in the context of the history of the Society, the clip offers fascinating evidence regarding the changing views of newer members vis-à-vis their “elders” and other speleological “pioneers.” As I have explained at different points in this work, the foundation of the Venezuelan Speleological Society was partly premised on the rejection of an individualistic and bombastic speleology. Such a speleology was not only deemed unscientific, it also was rejected as elitist, sensationalist, and even, imperialistic. While Society members recognized the importance of garnering public support, many (including my father) found the clip over-the-top. Nothing quite like it was ever repeated in the history of the Society.²

Yes, on all of these counts this clip was an extraordinary piece of evidence. But it also was a gift imbued with personal significance that I now treasure along with photographs, newspaper clippings, and recorded interviews that make up the bulk of the data for this project. The same is true of every single volume of the Venezuelan Speleology Society’s *Boletín* that is now part of my home library. These objects are personally significant for three reasons. First, they are material clues that help me reconstruct bonds of relatedness that were so important in my father’s life and eventually, my own. Second, these objects reveal a peculiar geography of my home country, which I left behind at 15 and I yearn “to know” better. Third, through their exchange and my

² This is not to say that the Society completely gave up publicizing its work. However, these efforts always brought with them lively discussions among the members, and at times, even accusations that some were trying to gain individual fame on the backs of the Society by participating in one project or other.

attempt at understanding and reading them, I have forged new relations of my own, to people, the landscape, and their interrelated histories.³

These reflections on objects gathered through my research extend to spaces as well: to the Society's small headquarters in the basement of a residential building in the Caracas, people's homes, hiking along the Venezuelan karst landscape and dipping—cautiously, excitedly—into its caverns. Objects and space come together most powerfully in cave maps. In the stories I tell, I have stressed the collective, poetic, and dialectic qualities of these maps, both in their production and their reading. In doing so, I have proposed opening up the geographies of science by focusing on the relational, affective, and experiential qualities of scientific practice. For the Venezuelan speleologists I have featured here, so much of their science is about exploring extraordinary spaces with others. These experiences often forge new or strengthen preexisting bonds of relatedness. Yet, what happens in the caves, in the field, or even in the group's headquarters is not enough to appreciate the work and commitment necessary to maintain the speleological project through time. Juan Antonio Tronchoni understood this, and for this reason he stressed the need to foster camaraderie, whether in restaurants or members' homes, including his own.

Analyses of dynamics between prescribed spaces of science (e.g., laboratories, the field, conference halls, etc.) and other spaces (e.g., homes, bars, golf courses, etc.), has two important implications on the academic study of science. First, it shifts attention to spaces where new collaborations and even ideas are forged and created that then travel

³ That these objects also are evidence for my work does not make them any less personally significant. If anything, they make them more so, as they help me develop a project that has kept me busy for so long, often far from my home.

back to laboratories and field sites.⁴ Analyzing these dynamics (including *how* this traveling of relations and ideas occurs) might help us understand how and why people come together to start and maintain new scientific endeavors through time. I suspect that such analyses would suggest that people's capacity to navigate different spatial domains to spark and build new relationships of friendship and trust actually further scientific practice. Second, opening up the geographies of science might help us learn how scientific practice, the places where it takes place, and the knowledge it produces might become meaningful to scientists and others' lives. Both of these implications add a relational and affective aspect to the already studied normative and moral dimensions of science (e.g., Latour 1989, 1999; Leigh Star and Greisemer 1999[1989]; Shapin 1998). Some of these dimensions might be entangled. All three are in the case of the production of the Speleological Cadastre of Venezuela I describe in Chapter 3.

From an anthropological perspective, exploring these spatial, material, and affective dynamics of relatedness broadens our appreciation of where, how, and why these relations come into being beyond the more traditional domestic "sites" of kinship, such as homes (e.g., Bahloul 1996; Carsten 1995; Mueggler 2001; Smith 2009:8-9). Some anthropologists have examined kin relations in the context of work (e.g., most recently Smith 2009 among miners in Wyoming; Yanagisako 2002 among Italian family firms). In my work, I emphasize the blurring of and dynamics between spatial domains as

⁴ This proposal was inspired in part, by my own husband, who works in a laboratory at the Physiology Department of the University of Iowa. Both at home and in the car we keep pens and notepads that come in handy whenever a "work" idea pops up and must be scribbled down. If this happens at home, he detaches the piece of paper and puts it on the table near our door, next to the keys. If we happen to be out and about, he puts the piece of paper in his pocket, and *then* put places it next to his keys once we get home. Either way, he never misses taking it back to the lab the next day of work.

these relations are strengthened and forged. In my case, these relations, this spatial blurring, is not the “behind the scenes of science” that some geographers have explored, but critical to the production of science itself (Lorimer and Spedding 2005).

Despite speleology’s and indeed—the Society’s—emphasis on cave *science*, I have strived to present the cave landscape as a distinctly polyvalent space, both as spaces of exploration and represented spaces. The cave landscape’s intense symbolic and material qualities come into being as human bodies traverse its underground passages (Eliade 1962; Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990; Shortland 1994; Williams 2008). Caverns are not spaces of dwelling or habitual practices. Thus, my case study calls on theorizations of space that consider intense human encounters with *newness*. By considering caverns as spaces of exploration, as objects of science, this study also has broadened the range of human-cave relations (Bonsall and Tolan-Smith 1997; Brady and Pruffer 2005). In doing so it hopes to be of use to cave archaeologists interested in enriching their appreciation of potential uses and meanings of caves. In the context of Venezuela, this also has meant considering speleological activities alongside and in relation to other cultural (indigenous, folk) practices that center around caves (Perera 1988).

And yet, as extraordinary as these spaces are, I have stressed thinking of them, of the unique experiential qualities they engender, in dialectic with their representations, and even, other spaces that help make their exploration possible. I return to this topic below as I reflect on my own positionality vis-à-vis my object of study.

In the context of Venezuelan anthropology, this project makes a number of important contributions. By taking mostly urbanite and culturally elite speleologists as its

main focus, the project goes beyond the more traditional indigenous ethnographic subjects. On this front I build on important works that also “study up” such as Fernando Coronil’s analysis of the political and economic elite in *The Magical State* (1997) (Boyer and Lomnitz 2005; Nader 1969).

The present project engages the topics of nature and history that have been critical in providing novel analyses of both state-sponsored and popular discourses of nationalism (Altez 2006; Coronil 1997; Cunil Grau 2007; Reig 2006/2007). This study also contributes with efforts to uncover a broader perspective on history that goes beyond (and may even challenge) state-sponsored official histories, a salient theme in recent Venezuelan anthropology (Altez 2006; Arvelo-Jiménez 1990, 2000; Hill 2000; Coronil 1997; Pérez 2000; Reig 2006/2007). This topic is particularly relevant in the broader context of Latin America. During the years leading up to and succeeding the Columbian quincentenary, Latin America has been at the vanguard of social movements that have challenged the conception and practices of the nation-state (de la Peña 2005; Escobar 2001; Jackson and Warren 2005; Mignolo 2005; Warren and Jackson 2002). The redefinition of cultural (including national) identities, nature, and even the juridical concepts of patrimony and ownership has been a fundamental part of these challenges.

The study of speleology adds an ethnographic case study of scientific practice that also is novel within Venezuelan studies of science. While Texera Arnal has produced valuable social histories of Venezuelan ornithology and zoology, neither follows practitioners to the field (2002, 2003). Moreover, both cases involve “academic” disciplines, although her analyses do stress the contributions of amateur enthusiasts in their promotion prior to their formalization as disciplines. With my emphasis on opening

up the geographies of science and exploring their dynamics and intimacies, I hope to question some of the characterizations of scientific practice as either “of the field” or “of the lab” or even “of academia.” I also take up the idea that “the 'scientification' of society, on the one hand, and the politicization of science, on the other” as one of the main characteristics of Latin American science during the last 100 years (Saldaña 2006:161). In contrast, the activities of the SVE buck this trend, opening up a space for “civic science” (Withers and Finnegan 2003). What other examples such as this might there exist both in Venezuelan and in other Latin American countries? Finding out could reveal a previously unexplored dimension of civil society on the one hand, and experiences and imaginings of the nation on the other.

As I already have noted, this study joins efforts in challenging monolithic imperial and colonial histories by focusing on the particular experiences of explorers (Burnett 2000). In the case of explorers in Venezuelan territory, scholars such as Burnett and Raffles have made critical contributions (Burnett 2000; Raffles 2002; see also Vessuri 1999). Yet, this project tests these studies insights in a different context, since its protagonists are neither formal imperial nor colonial subjects charged with advancing political goals in lands other than their own.

Despite these contributions, this dissertation also poses new questions that deserve further research. Chapter 6 already notes the need to investigate the indigenous baquianos’ perspective on the speleological project. Chapter 7’s tentative conclusions regarding the relationship between speleological practice and the Venezuelan state beg further analysis in relation to the radical political transformations in the recent years. Omitting an analysis of gender relations among speleologists, even if the number of

women as members of the Venezuelan Speleological Society typically has been small, is a limit of this study. The very fact that few Society members have been women begs further analysis. Finally, how might this study help rewrite a world history of speleology? For now, I want to consider some of the ways an anthropological study of speleological practice resonates with ethnographic inquiry more generally.

Adventures in Caving, Adventures in Anthropology

There is immense satisfaction in going not just where no human being has ever gone before, but where — if there *is* any meaning in it — no human being was ever meant to be. — Richard Watson, *On Caving*

Here I want to recall my two experiences leading the exploration of unsurveyed passages. Chapter 4 opens with the account of my claustrophobia in Roraima Sur Cave. Chapter 6 narrates my descent into *El Alto de la Palencia Sima 3* where a fear of snakes cut my aspirations of discovery short. These two experiences contrast with two other memorable cave moments. During a cave surveying course at Mammoth Cave in 2003, my instructor suggested I make my way along a side passage, away from the group, to urinate. "It is so dry here, whatever you leave behind will evaporate quickly," she explained. "Just make sure you do it off to the side — we are on tourist trail." And off I went, with my headlamp piercing the darkness. I had already been underground for about three hours and had felt completely comfortable, but this was the first time I trekked along completely alone. Fear held me back, but the darkness ahead also beckoned. *How far am I willing to go?* I taunted myself. I pushed myself to walk up the passage a little further, heart pounding. I opened my cave overalls, turned off my light, and urinated in absolute darkness. Walking

back to the group, I felt like the dark behind me weighing on my back, as if it wanted to embrace me, or swallow me whole.

Just a few days before, the mood in a dark and much tighter corner of Mammoth Cave was very different. As our geology instructor spoke about the layering of sedimentary rock, I put my pencil and notepad down and relaxed my body on the cool rock bearing my weight. I turned to look up at the rock above me, only a few feet above my face. Thoughts of being suddenly sandwiched between the Ste. Genevieve and Girkin formations gave way to a feeling of calmness, of protection. The smell of dampness and mud overwhelmed me, the voice of my instructor filling the void, coming from nowhere in particular. I closed my eyes, and focused on nothing but *being* there. Being *there*.

During my dissertation research, I have been collecting descriptions like these, all of them highlighting the sometimes bizarre and often surprising experience of going underground. I have been saving these descriptions, doubting they would make their way into my thesis. Yet, I came to think of my self-censoring as an invitation to reflect on the practice, history, and politics of anthropology.

One of my Venezuelan informants admitted that one of the reasons he loves caving was that exhilarating feeling of crawling down a passage that just might lead to a large and beautifully decorated room. He loves the appeal of discovery, which, he quickly acknowledged with a sheepish smile, smacks of imperial fantasies. Cave explorers often cite this draw of discovery, of stepping into uncharted spaces, as a strong motivation for what they do. What to make of this? No anthropological analysis would be complete without deconstructing a claim of discovery, which a postcolonial critique has repeatedly revealed as an imperial impulse characteristic of a Euro-centered paradigm of both

symbolically and materially appropriating nature (e.g., Mignolo 2005; Pratt 1992). More often than not, claims of discovery are acts of erasure, of complete disregard and even overt destruction of alternative systems of knowledge. We should be suspicious of claims of discovery. What motivates them? What differentials of power do they conceal?

Moreover, a critical analysis of cave exploration and mapping cannot miss considering the activity as a part of the rise and commodification of travel. The appeal of adventure, in particular, gained purchase within the context of European imperial expansion, and, more recently, “adventure travel” has become popular within “a system of global capitalism that makes it possible for a small segment of the world’s population to have the resources to journey afield in order to have ludic adventures” (Gordon 2006:20). I have already noted E. A. Martel’s efforts to win over converts from mountaineering to this new “sport-science” by claiming that unlike the popular and well-trodden alpine peaks, an entire world awaited exploration and discovery underground (Cant 2003:70). Moreover, caves were (and still are) the last pristine frontier, spaces befit for the challenges of true Adventurers, spaces where they can either discover or augment their decidedly male heroic persona. Or are they?

In *Tarzan was an Eco-Tourist...and Other Tales in the Anthropology of Adventure* (2006), a number of scholars critically examine the experience and trope of adventure from an anthropological and historical perspective. Contributors take Georg Simmel’s writings on the topic as a starting point. In his 1911 short essay “The Adventure,” Simmel posits that

[w]e are the adventurers of the earth; our life is crossed everywhere by the tensions which mark adventure. But only when these tensions have become so violent that they gain mastery over the material through which they realize themselves – only then does the 'adventure' arise. For the

adventure does not consist in a substance which is won or lost, enjoyed or endured: to all this we have access in other forms of life as well. Rather, it is the radicalness through which it becomes perceptible as a life tension, as the rubato of the life process, independent of its materials and their differences – the quantity of these tensions becoming great enough to tear life, beyond those materials, completely out of itself: this is what transforms mere experience into adventure. [Simmel 1997:232]

As David Stoll suggests, one problem with this definition is that it characterizes adventure as accident, as calamity, while he and the other contributors to the volume stress adventure as “a deliberate undertaking that requires conscious choice and awareness of risk” (2006:271). Other contributors characterize adventure as a form of modernity that has gained purchase in the context of global transformations such as the commodification of travel (Yengoyan 2006:28). Precisely because of such associations, I chose the less charged term *exploration* to emphasize the kinds of intimate and intense engagements in/with place that often (always?) characterize cave traverses. In Chapter 6 I present Venezuelan speleologists’ accounts and interpretations of indigenous baquianos also *exploring*. Their perspective (which I am inclined to believe) echoes Steven Rubenstein’s argument, based on his ethnography of the Shuar Indians of the Ecuadorian Amazon, that adventure is *not* solely an expression of modern Western culture (2006:236).⁵

I also have pointed to Sarah Cant’s analysis of the leisure pursuit of caving, arguing that to some cavers, their relationship with caves’ peculiar spaces can be best described as sensual, intimate (2003:69). But as she argues, “these ideas of intimacy may disrupt ideas of ‘toughness’” that in turn challenge the notion of adventure as cast within

⁵ In the same volume Yengoyan highlights the work of Nerlich (1987) who argues that while “adventure itself is an epic of modernity, adventure has its roots in a period in European thought and history that was precapitalistic and also premodern” (Yengoyan 2006:28).

the frame of male heroics, or, as Simmel suggests, adventure's conquering gesture (Cant 2003:69; Simmel 1997). Challenging conventional stereotypes of the macho adventurer set out to discover and appropriate nature, Cant's attention to individual caver subjectivities reveals a more subtle notion of exploration, one that is closer to another aspect of the experience of adventure, per Simmel, who actually considered adventure's "gesture of conquest" in *dialectical* tension with "complete self-abandonment to the powers and accidents of the world, which can delight us, but in the same breath can also destroy us" (1997).

Closer... but different. Simmel's conceptual pendulum swings from conquest to a passivity courting death, all the while staying within the confines of the accidental, the calamitous. Moving along cave passages, spaces that are as varied as they are dark, the body is not so much challenged (although certain spots surely earn this characterization) as it is invited along in a cautious negotiation with stone. Moreover, in the process of cave mapping, this movement takes on a collective rhythm, challenging the paradigm of the lone explorer/discoverer. As I have suggested, some passages are so delicately decorated that a caver readjusts his bodily position so as to move along without causing damage. Some spots he avoids altogether and may even attempt to physically conceal so as to keep it from view from future visitors with different sensibilities. The risk of damage is too great. In a move that contradicts the performative quality of Exploration as performance, the revealing imperative of Science, the decision to keep great discoveries secret is common among many cave explorers all over the world.

Intimacy, concealment, sensuality. These are attributes not typically associated with the stereotypical construction of modern adventure, much less of cartographic

projects. Even the draw of discovery is not ubiquitous, at least not if framed within the paradigm of Western science. In 2007 I had the opportunity of visiting the non-touristic sector of Guácharo Cave, along with fellow SVE member Maribel Ramos, and two Australian cavers visiting the country.⁶ This was the first time any of us had been in this cavern. Did it matter that it already had been explored and surveyed? Did this preclude each of our personal sense of exploration and discovery, even while accompanied by an experienced cave guide? Not entirely. Traversing this cave's passages was still a novel experience to each of us. At times crawling, climbing, and even swimming, this sense of novelty heightened by ignoring the map I carried in my backpack, and allowing instead the cavern to unfold in rhythm with our bodily efforts, and the always limited reach of our lights.

Whether a deep, subconscious connection that stirs our common humanity is responsible for the intensity of human experience underground is something many scholars have examined (Eliade 1962; Eshleman 2003; MacLeod and Puleston 1978; Sheets-Johnstone 1990). While it might be impossible to provide conclusive evidence for such proposition, physically traversing cave passages is unlike any quotidian human experience *anywhere*. Taking this fact seriously, along with cave explorers' motivations for why they do what they do, has been an important point in my work. I have sought out alternative interpretations by thinking of *discovery* as a process of unfolding, of becoming, as opposed to the *a-ha!* moment of science, itself more fiction than fact. A space of alternative interpretations reveals itself even further when thinking of cave

⁶ Ramos, among the younger and most recent members to join the SVE, was thrilled with this chance. "All serious Venezuelan speleologists *know* Guácharo Cave... How could I not?" she half-joked.

explorers' experiences as intensely embodied practices, their bodily, affective, and cognitive capacities the results of a long evolutionary and cultural history. These embodied practices, of course, cannot be considered separate from the peculiar spaces of caves themselves, their shadowy and sinuous inner worlds a radical departure from the rectilinear spaces of the built environment, or even the paths along which we trek out in so-called nature.

My conclusions, even when tentative, derive not just from exploration narratives and interviews, but also from going along on not one but many treks underground. As an ethnographer, I have sought to go where people are (or in this case, *go*), and, to the extent that it is possible, share in whatever they are doing (Fricke 2004). It is from this epistemological and methodological impetus that ethnographers derive their authority, their claim on authentic and meaningful insights on the human condition. This being the case, as ethnographer I am not exempt from the intensely embodied experiences and imaginings that I have attempted to describe of my informants. This has implications on the representations I produce, this time in the form of ethnographic knowledge.

In his book *Devil's Book of Culture* (2003), anthropologist Benjamin Feinberg features a picture of himself squeezing into a cave, the upper part of his body gobbled up by stone. The caption reads: "The author searches for culture inside the Sierra Mazateca" (2003:227). Cave exploration as metaphor of the ethnographic inquiry, as immersion into a culture. Anthropologist Stefan Helmreich expands on the metaphorical and explicit associations between ethnographic inquiry and "immersion" in the field, as he joins a crew of oceanographers in a dive to the seafloor (2007). He notes:

In what I initially imagine to be an idle pun, graduate students on *Atlantis* have joked that I will now truly "immerse" myself in the culture of deep-

sea oceanographers, seeing their preferred medium with my own anthropological eyes. [2007:621]

Helmreich both sympathizes with and criticizes the immersion-into-the-cultural-medium metaphor, cautioning against the sense that immersion somehow automatically, passively, grants knowledge, insight, and in the case of ethnographic writing, an aura of authority, of being in the present, being *there*. He suggests we think not of immersion but of transduction, and the possibilities that a transductive ethnography might afford:

an inquiry motivated not by the visual rhetoric of individual self-reflection and self-correcting perspectivalism, but one animated by an auditorily inspired attention to the modulating relations that produce insides and outsides, subjects and objects, sensation and sense data. [Helmreich 2007:622]

In caves, Helmreich's proposal extends from the focus on audition to that of all senses, as he himself suggests in a footnote. But recalling Eshleman (2003), our entry into caves as ethnographers just might do more than stir the senses. I have noted some speleologists' imaginings regarding their encounters in the Venezuelan karst. I have not been exempt from imagining myself: Muscles on the move, joints aching, rock all around us, the imagination soars, impossible not to think of myself (and, by extension, fellow cavers around me), as part of a long evolutionary lineage that has been captivated by spaces such as these in the past. It is not even necessary to plunge down such long evolutionary scale... our own developmental paths began with our own coming out of dark and embracing spaces, as psychologist Carl Jung and historian of religion Mircea Eliade remind us. Our the first years of our own lives were marked by an extreme sense of curiosity, a need to explore, first on our bellies, then on hands and knees and onwards. One need not even leave one's home to rekindle our fascinating with exploration and the imaginings it inspires (Bachelard 1994[1958]).

All fieldwork experience—that extraordinary privilege!—is marked by moments of curiosity, wonder, excitement, fear. Our senses are overwhelmed. Imagination soars. In this light it is not a stretch to think of ourselves akin to the cave explorer drawn to discover (no, not "discover," but *discover*). What happens with these experiences as we return from the field, as we begin the process of writing up? Do they get deleted, edited out, lest our professors and/or colleagues confuse our ethnographic writing for a travelogue? This is precisely the kind of editing that the professionalization of anthropology has depended on (Fabian 2000). Concerned about the “imminent danger of disembodied postcolonial theorizing,” Fabian contends that “[e]cstasis, in a nontrivial understanding of the term, is (much like subjectivity) a prerequisite for, rather than an impediment to, the production of ethnographic knowledge” (2000:xiii-xiv;8). In his essay on adventures in mountaineering, David Houston echoes Fabian’s point:

Anthropologists set out to study from a distance those whom we are not ... we maintain our "distance" and our claim to an anthropological core. At the margins of experience, however, this equation is more difficult. Here, we define the adventurer as "Other." ... Is what we do so different from the adventurer? ... Adventure presents us with a challenge to our own denied "nativeness." If we deny a part of us that wears adventure like a well-fitted suit, we risk becoming the object of our own study, our own "other." [Houston 2006:159]

As I ponder on alternative ways of interpreting and understanding cave explorers' motivations for what they do, and my own growing obsession with the spaces that captivate their draw for exploration and wonder, Fabian's suggestion to both acknowledge and embrace the ecstatic appeals to me, as does Helmreich's suggestion of a transductive ethnography. They acknowledge the sensory, the experiential, in that which we do, where we do it, and with whom. Reading Helmreich's ethnographic account of submersion deep within the ocean, I sensed, as I did with Eshleman, an attempt to capture

and validate a sense of wonder, of curiosity, and even joy in the possibilities of exploration and even adventure afforded to us through fieldwork, and even the process of writing.⁷ Recalling those moments both within and beyond caves, I begin to imagine them as new leads to explore—cave passages and flickering shadows a perfect simile to the process of knowing, of imagining, of being human, past, present, and future.

Coda: Guácharo Cave Opens Up

I finally visited Wilmer and Oscar's 1967 Guácharo Cave campsite in March 2008. This was during a tour of the non-touristic sector of the cavern lead by expert guide Benito. Aside from Maribel and myself, two Australian cavers, Julia James and Alan Warild, whom I had met at an international speleology congress, joined us.

The day before our scheduled cave entry, I contacted a reliable taxi driver and friend of the Salazars, my Caripe host family. He showed up at 3:30am, smiling, explaining that he feared sleeping in. Our approach to Guácharo Cave on that Tuesday, March 11th, was very different from Humboldt and Bonpland's hilly trek. The drive from San Agustín to Guácharo Cave is about 15 minutes long, winding its way past homes that are technically within the national park boundary. Benito was waiting for us. We quickly checked our equipment, and headed towards the entrance of the cave, where, for the first time, I witnessed the guácharos flying back in to their home, after a day or more of travel in search for food. It was 5:30 am.

⁷ I use the term adventure here with caution, mostly to emphasize some of the unpredictable and even risky aspects of intellectual pursuits. These pursuits, especially the ethnographic ones, must always be guided by a sense of responsibility and even humility. See Stoll 2006 for an important argument against approaching anthropology as a kind of adventure if this adventure puts others with less power at risk.

We walked swiftly along the tourist path along the Humboldt Gallery, past the Humboldt marble monument, and then into the Gallery of Silence. We quickly reached the point where we veered off the tourist path, a small set of stairs guiding us into the low waters of the out-flowing cave stream. The water slowly made its way up our chins. Our first full-body plunge occurred at Scharffenorth Pass, where we met up with a spot that required some free climbing along a smooth surface of flowstone. The *Paso del Viento* followed a few minutes later. Benito made it through first, carefully maneuvering his white gas lamp through the small air opening that the water level spared for us that day.⁸

As I squeezed my body along the *Paso del Viento*, with barely my mouth and nose over water, I thought of my mother back in 1967 making this same trek to visit her boyfriend who camped cave within. I thought, too of what might have possessed the first explorers, all cave guides, who successfully pushed this passage in 1946 and found the cavern opening up on the other side. I recalled stories of speleologists protecting their equipment in oil canisters so they could be submerged at this point without getting wet. I also regretted not having with me some *chinguirito*, the alcoholic drink made with cinnamon, cloves, sugar, and rum that the families who lived in the hamlet in front of the

⁸ I thought to myself how incredibly cumbersome this lamp was, so delicate with its cloth sheath and glass case. At this point there was the added worry that the glass, hot from the burning of the inner flame, would crack with the slightest splash of cool water. Benito had to turn it off and let it cool before moving ahead. Meanwhile, he pulled out one of his two extra light sources that run on batteries. Why not give up the gas lamps and switch to battery-operated flashlights instead? In the local economy of Caripe, he explained, replacing flashlights and batteries is much more expensive for cave guides than the purchase and upkeep of the durable gas lamps. If handled properly, these lamps can have an extremely long life. I saw guides spending a good amount of time cleaning their lamps, pulling them apart and clearing valves and knobs from the accumulation of gunk. In the cave, the guides managed to handle these lamps with impressive agility. Benito was no exception. Alan, Julia, Maribel, and I, in contrast, relied on our battery-operated and water-resistant head lamps, clipped onto our helmets, as our main sources of light.

cave would prepare and sell to the explorers. A few swigs might have made the pass a more relaxed, maybe even ecstatic affair!

Once past the *Paso del Viento*, we continued to walk 100 meters along a relatively straight passage cut through by the river. This was the *Galería del Jorobado* (Gallery of the Hunchback). Our backs welcomed relief further ahead, where the cave branches into three. Benito guided us to the side branch on our right, known as the *Cuarto del Chorro* (the Waterfall Room). Indeed, as we made our way in, we could hear the rumble of water, heightening our expectation of finding some major waterfall. In fact, it is the size of the room that magnifies the sound of a series of small waterfalls in this salon, with a height at points of 15 meters. We wiggled our way to the very end of the passage, the final portion requiring some free climbing along the flow of falling water. This last room was full of helictites, delicate calcite cave formations that resemble a stoney tangle of yarn. We noticed too a couple of overflowing petri dishes and chemistry flasks, the material remains of incomplete and forgotten science projects of years past.

We returned to the point where the main cave passage branched into three and headed westward up to the *Gran Salón del Derrumbe*. Getting there required some effort to make it up the 4 slippery meters of the *Piedra del Mecate*. Once we were all on the ledge at the top of this pass, we got on hand and knees to squirm through a small tunnel that emerged at the massive and heavily decorated *Gran Salón*, 100 meters along its east-west axis and with the ceiling hovering between 10 to 15 meters in height. It was in this room that the Speleology Section set up camp in 1965. Here too my father and Oscar Garbisu spent their 30 nights in back 1967.

We moved along the main passage of the cave, ignoring some of the side openings that now, with detailed map in hand, I could appreciate as adding over 2 kilometers of cave, some petering out into tight yet inconclusive passages, at least as of the 1971 description. We moved swiftly along a relatively straight passage that allowed comfortable walking, much along the cave's main river.

Before entering the *Galería de los Italianos* (Gallery of the Italians), we stopped for a brief rest and snack. At this point Julia suggested she stay behind since she was feeling tired and struggled to keep up with the group's pace. Coming from anyone any less experienced than Julia, I would have thought it a bad idea. Alan agreed with her, so we moved ahead, Benito calculating we would be back in a couple of hours. The *Galería de los Italianos* fascinated us with its crystalline speleothems, ranging from the absolute clear to yellow to orange to red hues cast by the mix of oxides in the calcite. Along this part of the cave is also the *Paso de la Gallina*, or the Chicken Pass, the one spot that made me most uncomfortable since it required some balance and intrepid gymnastics to make it over a 6-meter crevasse that leads to a level of passages below. Here I appreciated Benito's strength and skill, his arm reaching out to mine providing the assurance I needed to make the leap. The group's easygoing attitude and humor also helped. Alan began at this point imitating a chicken's cackle, making us all laugh (Alan spoke almost perfect Spanish). We reached the large *Salón de los Gigantes* (Giants' Salon), a massive room with over a dozen meters in height difference from end to end, requiring climbing or circumventing large breakdown blocks. At this point the cave divides into three large trunks. The first, which we did not visit, heads towards a northwest direction, and, according to the SVE description, contains impressive gypsum

crystal cups. The other two trunks run roughly parallel to each other in a southeastern direction. The northernmost of the two is known as the *Galería del Gran Cañon* (Gran Canyon Gallery), and ends in what is considered the final point of the cavern, the *Salón de la Virgen* (Virgin's Salon). The SVE description notes that

the year 1957 this point of the cave was first reached, honor which corresponded to the speleologists Juan Antonio Tronchoni and Mario Vega Herrera, accompanied by the guides Ramón Alén and Jesús Rodríguez. Doctor Oramas had left in 1956, in the Room of the Cottons, a small statue of the Coromoto Virgin made of seashells. This statue was taken to this salon that was considered the farthest point from the cave, and later, in 1961, given that it was quickly deteriorating, it was removed and replaced by a statue of marble. [SVE 1971:127]⁹

Given the obvious symbolic importance of this final room in the cave, I was somewhat disappointed when Benito told us we would be going doing the third trunk to the *Salón de las Copas*, or "Salon of the Cups," a much more decorated passage, with thick coverings of gypsum along what is appropriately referred to as the *Galería Río de Hielo*, or "Ice River Gallery." The Salon of the Cups gets its name for an astonishingly beautiful as they are delicate series of yellow-hued calcite crystals that punctuate the center of a crystal-crusting pool, just as solid water lilies, or, flat-topped cups. Since our visit occurred in the dry season, the pool had no water, but one could appreciate the beauty of the formation nevertheless.

We turned back on our way to meet Julia, who patiently waited for four hours in what is, in her esteem, one of the quietest caves she had ever been in. This description would have shocked Humboldt who only knew the part of the cavern that guácharos had

⁹ The virgin statue referenced in the SVE description of the *Salón de la Virgen* was eventually removed from the cave and placed in a small niche located across the entrance of Guácharo Cave. This spot contains other small religious statues, and is said to have been the site, until recently, of catholic masses.

made their home. Once back in the *Gran Salón*, Benito followed through with his promise of taking us into a beautifully decorated room known as the *Salón de Alén*, named in honor of the famous cave guide Ramón Alén who discovered this part of the cave and was, as previously noted, among the first to cross the *Paso del Viento* and reach the *Salón de la Virgen*. It was approximately 4 pm when we saw daylight again.

As I prepared the narrative of my visit to the depths of Guácharo Cave, I looked at my enlarged copy of the 2007 Guácharo Cave map, now scribbled with own notes—my personal palimpsest. I am convinced I *know* the cave better, this graphic representation, providing a two dimensional structure upon which to link notes, histories, paths of relatedness. As for me, the cave map reader—the Guácharo Cave tourist, the ethnographer-in-training—these representations aided my construction of a narrative of yet another visit to this formidable place. They also helped and affected my mental reconstruction of that place. The process was and remains a deeply emotional as well. Through these maps and the stories of people who know Guácharo Cave intimately and knew my father and godfather, I power a fiction, that somehow I am not a stranger like any other tourist, that somehow this is a kind of home coming, that I belong.

Figures

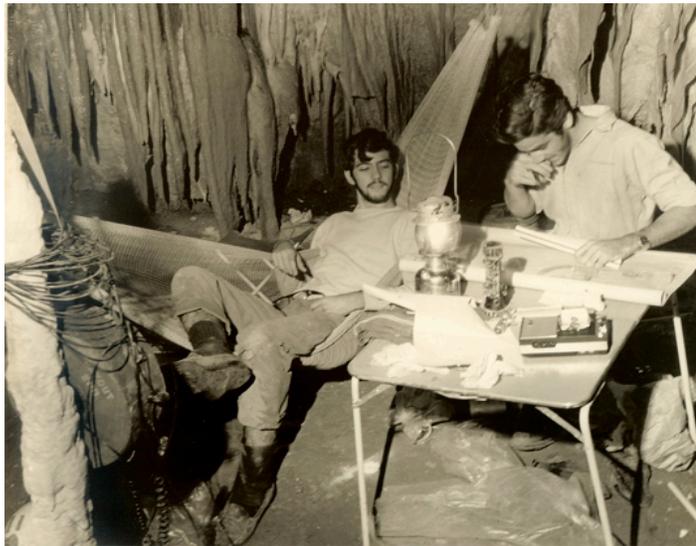


Fig. 1.1. Oscar Garbisu and Wilmer Pérez, Guácharo Cave, Caripe, Venezuela (1967) (SVE Archives).

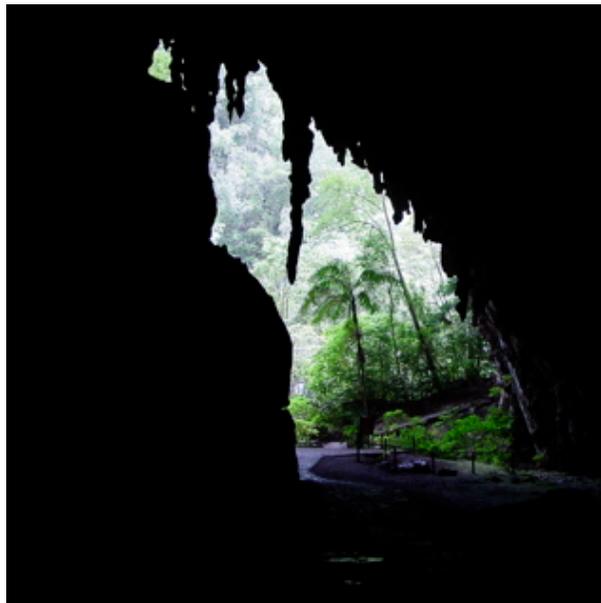


Fig. 2.1. Silhouette of the entrance of Guácharo Cave, seen from the inside, March 2008 (Author's Photo).



Fig. 2.2. A desiccated guácharo (*Steatornis caripensis*) in the Humboldt Museum located on the cave monument premises (Author's Photo).



Fig. 2.3. A tourist inspects the marble plaque honoring Humboldt inside Guácharo Cave, June 2007 (Author's Photo). The text reads:

1859-1959
 The Venezuelan Society of Natural Sciences
 Pays its tribute of admiration and respect
 To the universal wiseman
 Alexander Humboldt
 In the first centenary since his death, who arrived
 to this place the 18th of September of 1799.
 Speleology Section



Fig. 2.4. Eugenio de Bellard, Juan Antonio Tronchoni, and cave guide Ramón Alén in Guácharo Cave, probably in the early 1950s (SVE Archives).

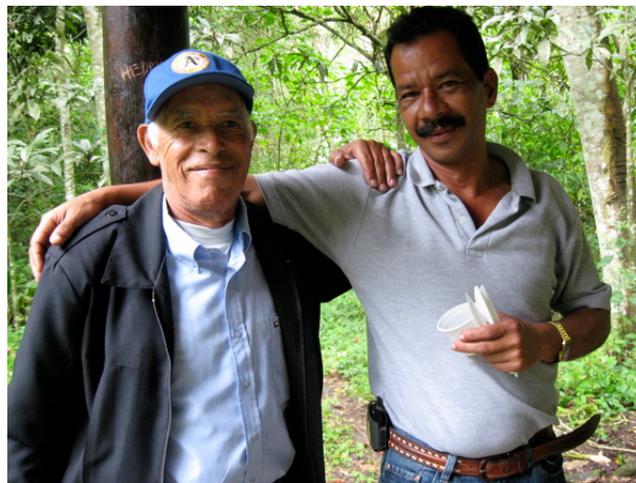


Fig. 2.5. Benjamín Magallanes, retired Guácharo Cave park ranger and guide and his friend Blas Salazar, son of the famed Guácharo Cave caretaker or *celador* Ramón Salazar. Blas is an active park ranger at the cave, February 2008 (Author's Photo).

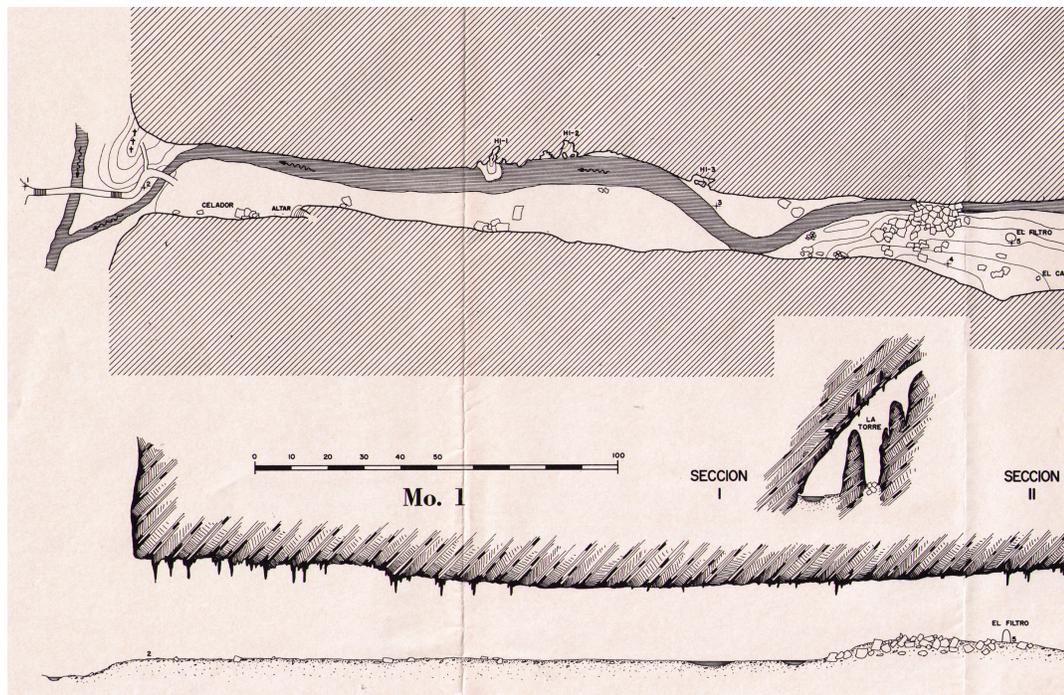


Fig. 2.6. Detail of the SVE Guácharo Cave's touristic sector map (SVE 1968). The top image is the plan view of the cave. The lower one represents the profile view of the same passage (the cave's main entrance). The smaller graphic in the middle right ("Sección I") is a cross-section of the cave, the point just beyond Humboldt's plaque.

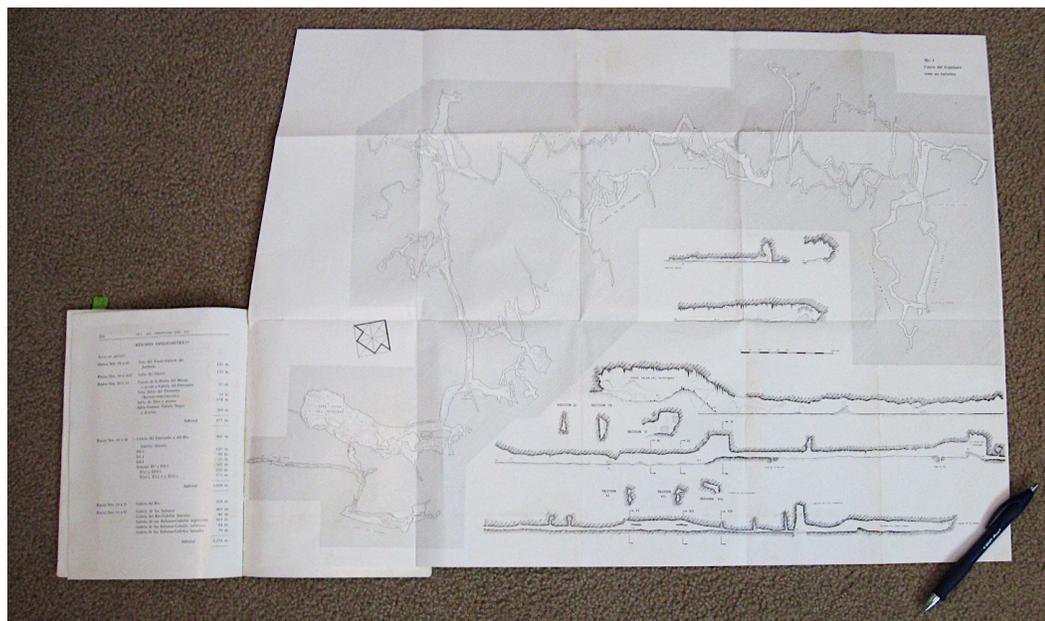


Fig. 2.7. The entire spread of the SVE Guácharo Cave map, from which the following details were taken (SVE 1971). The pen on the lower right hand corner provides scale.

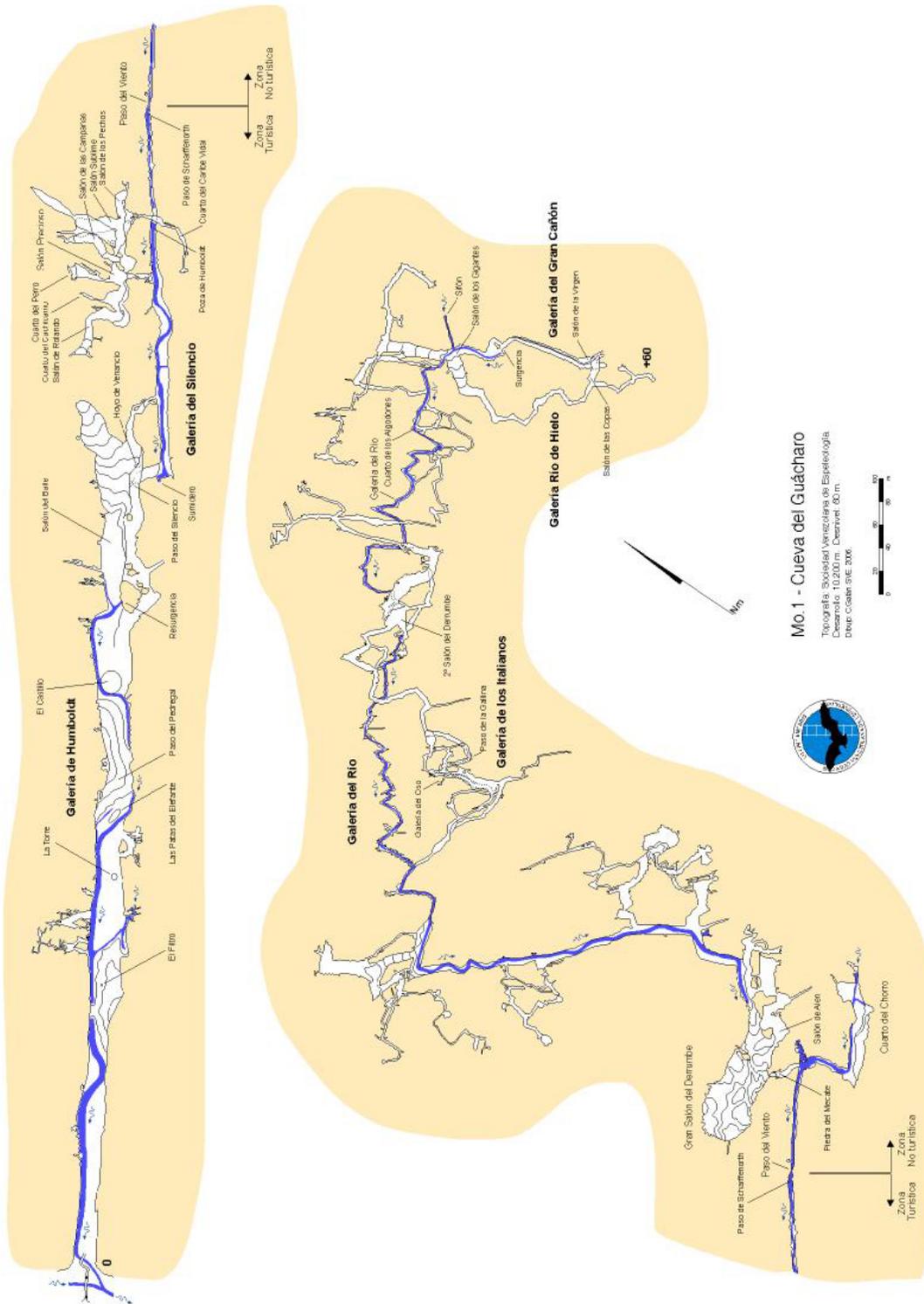


Fig. 2.8. Recent computerized rendition of the SVE Guácharo Cave map (Galán 2006). It only shows the plan view of the cave.

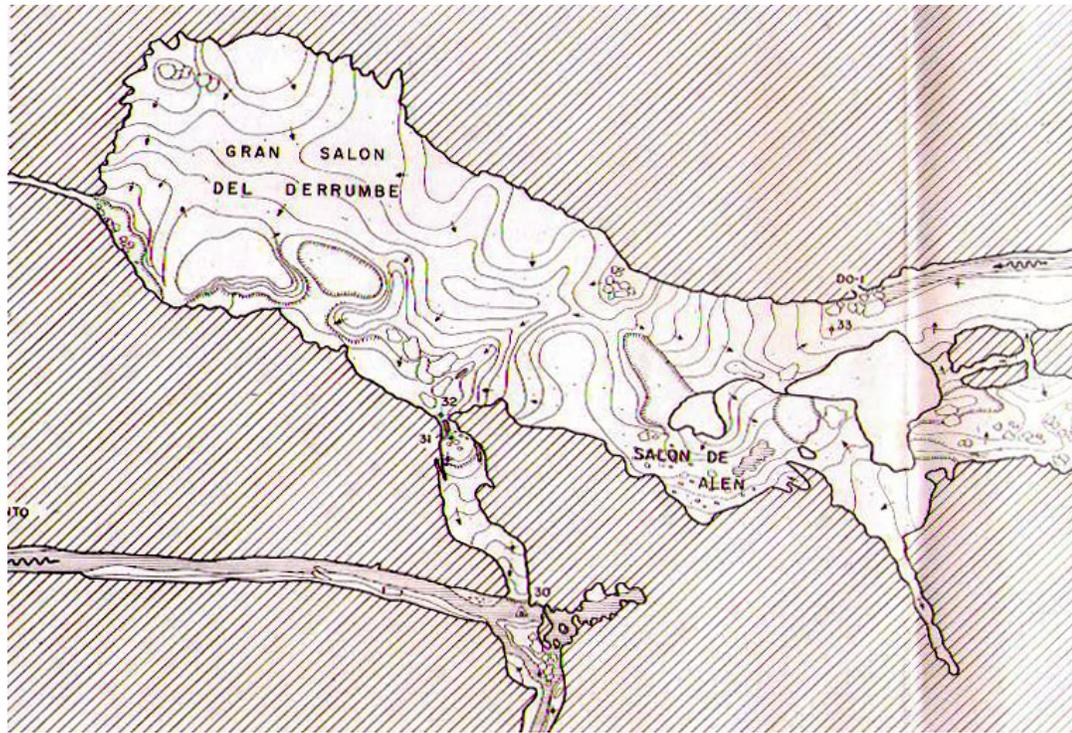


Fig. 2.9. Detail of the SVE Guácharo Cave's non-touristic sector map, showing the Gran Salón's plan view (the numbers 32 and 33 note where survey measurements were made) (SVE 1971).



Fig. 2.10. Detail of the SVE Guácharo Cave's non-touristic sector map, showing the Gran Salón's profile view (the numbers 32 and 33 note where survey measurements were made) (SVE 1971).

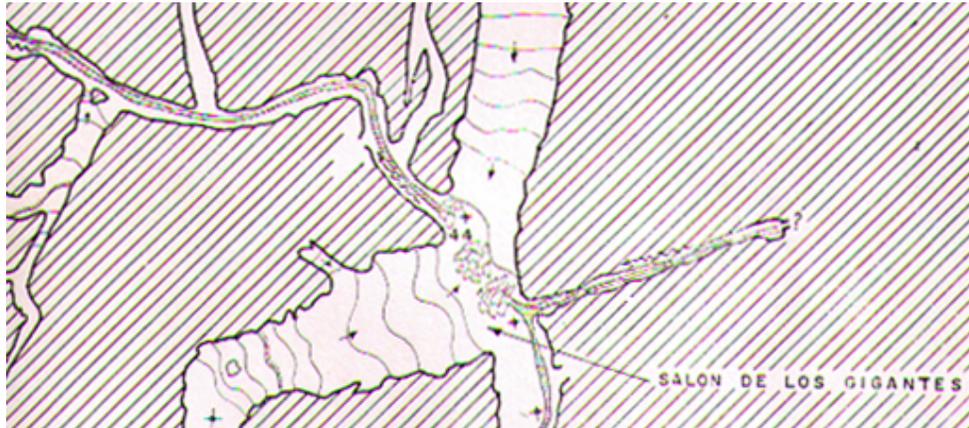


Fig. 2.11. Detail of the SVE Guácharo Cave's non-touristic sector map, showing inclusive passages (“incognitas”) marked with a question mark or left blank (SVE 1971).



Fig. 3.1 Carlos Bordón showing the author a portion of his entomology collection in the basement of his home, Maracay, Venezuela, June 2007 (Photo by Clotilde Pesquera).

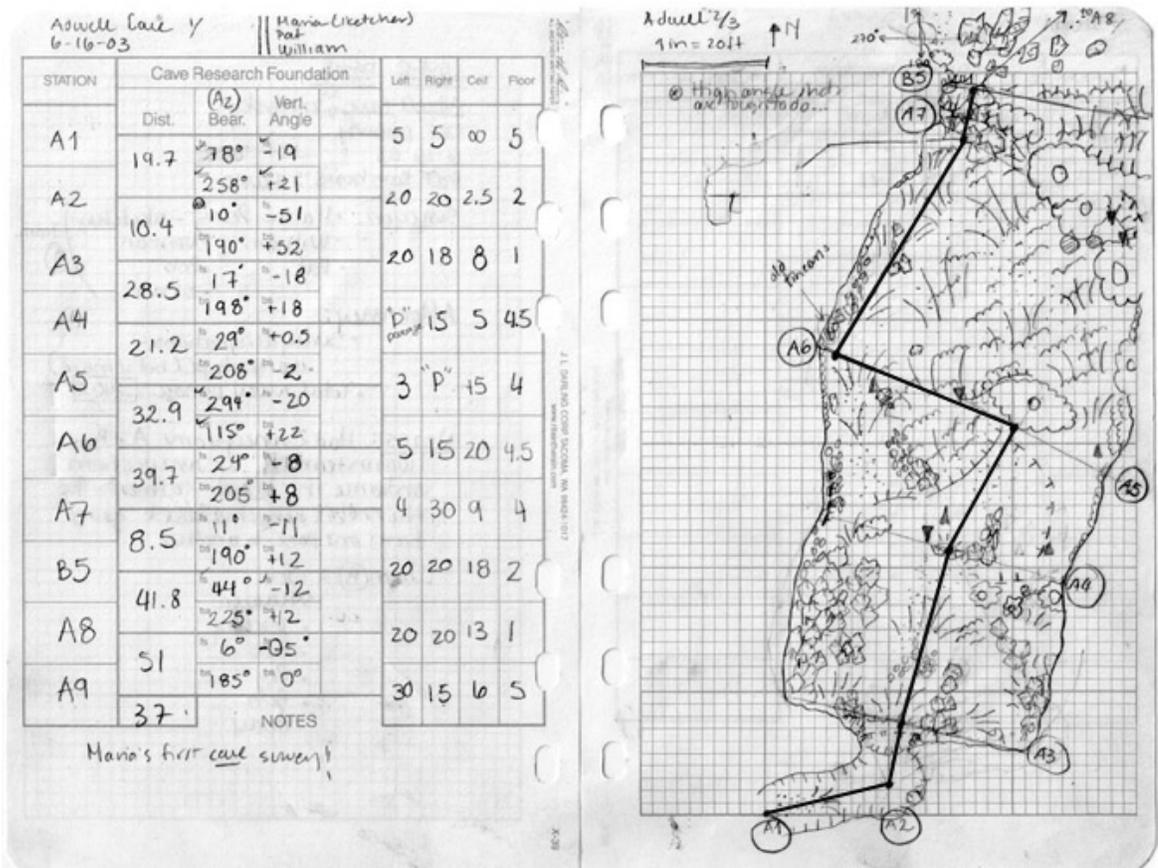


Fig. 3.2. Detail of my survey notes of Adler Cave, Kentucky (June 2003). The sketch is done to scale (here 1 inch = 20 feet). The basic principle of cave mapping involves creating a scaled two-dimensional line plot, highlighted here with a heavy black line, that represents the length, horizontal orientation, and vertical displacement of cave passages. The “view” this perspective affords is a view from “the top.”

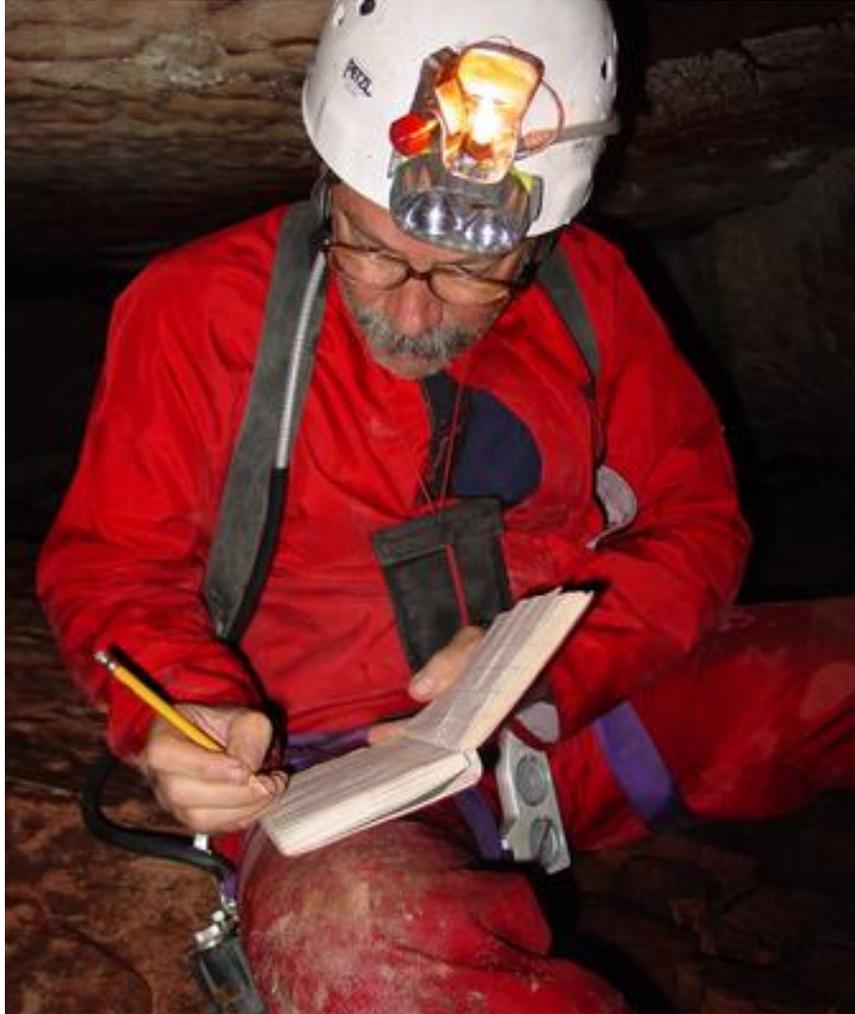


Fig. 4.1. My father, Wilmer Pérez, making survey notes in his water resistant field book inside Sistema Roraima Sur, Canaima National Park, April 2004 (Author's Photo). He uses a pencil because ink might smudge and bleed with water. He relies on a carbide lamp, attached to his helmet, for light. Carbide rocks and water produce acetylene gas inside the black plastic unit clipped to his belt. This gas connects this unit to the helmet front-piece, where a spark generates the initial flame. The helmet also has a battery-operated lantern.

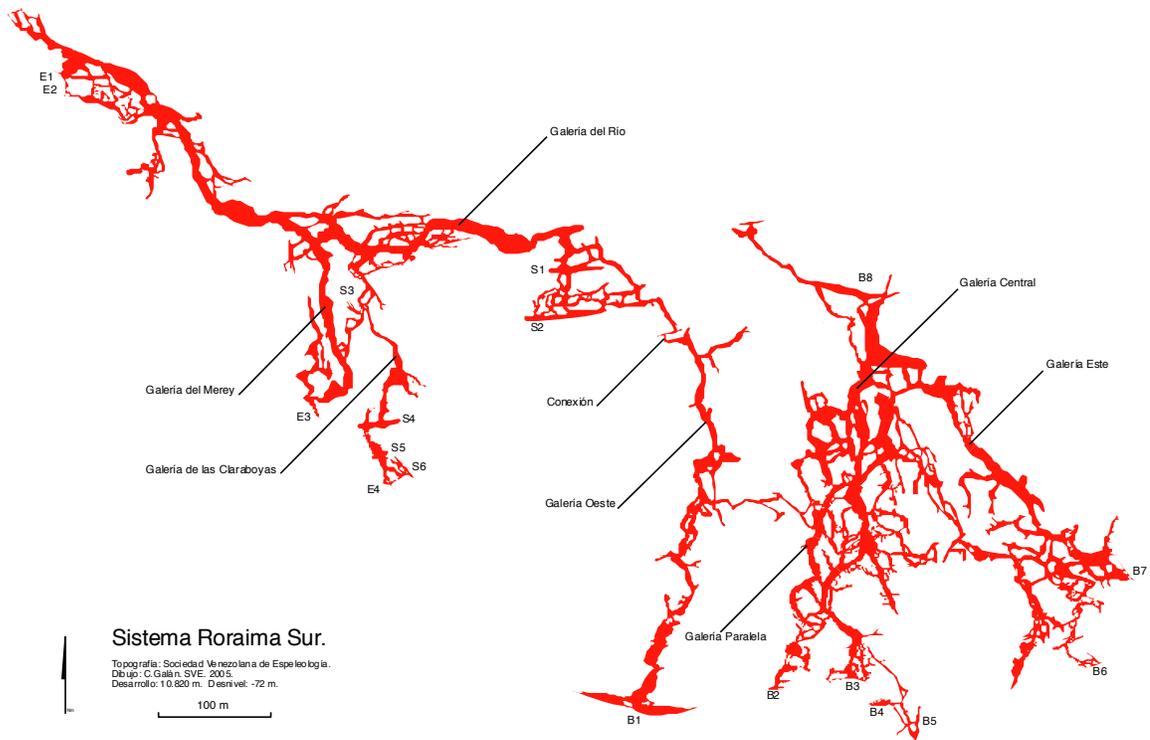


Fig. 4.2. The plan view, or view “from the top” of Sistema Roraima Sur, originally published in the *Boletín de la Sociedad Venezolana de Espeleología* (SVE 2004).

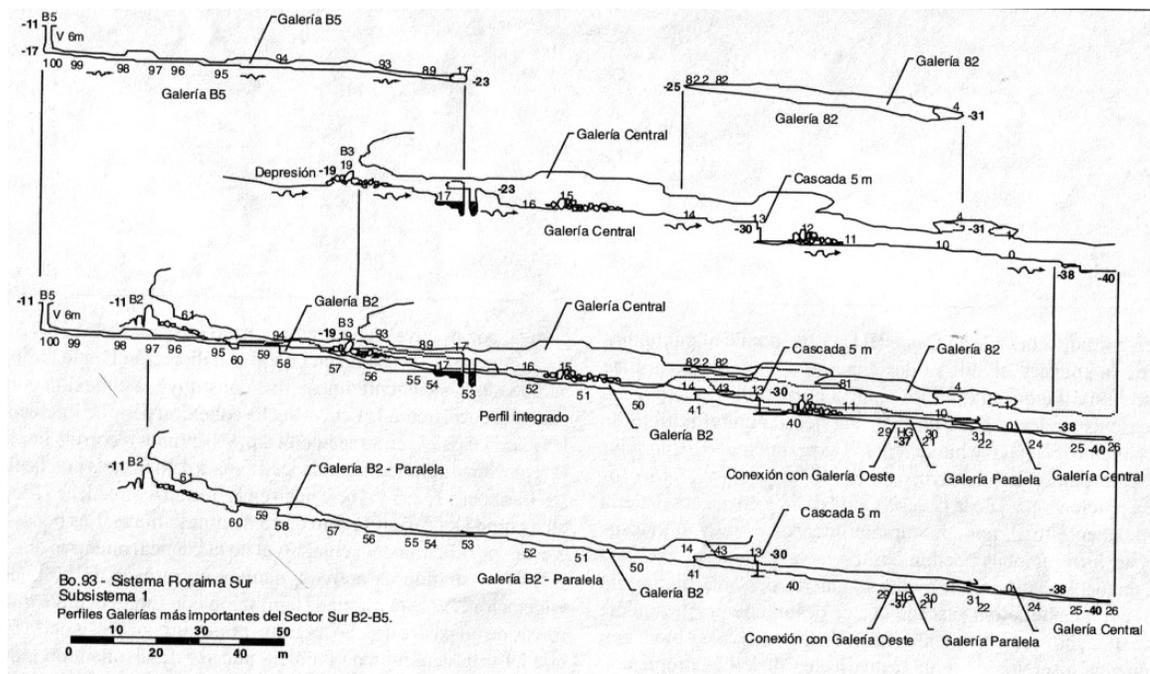


Fig. 4.3. Profile view of Sistema Roraima Sur’s Subsystem 1 (SVE 2004).

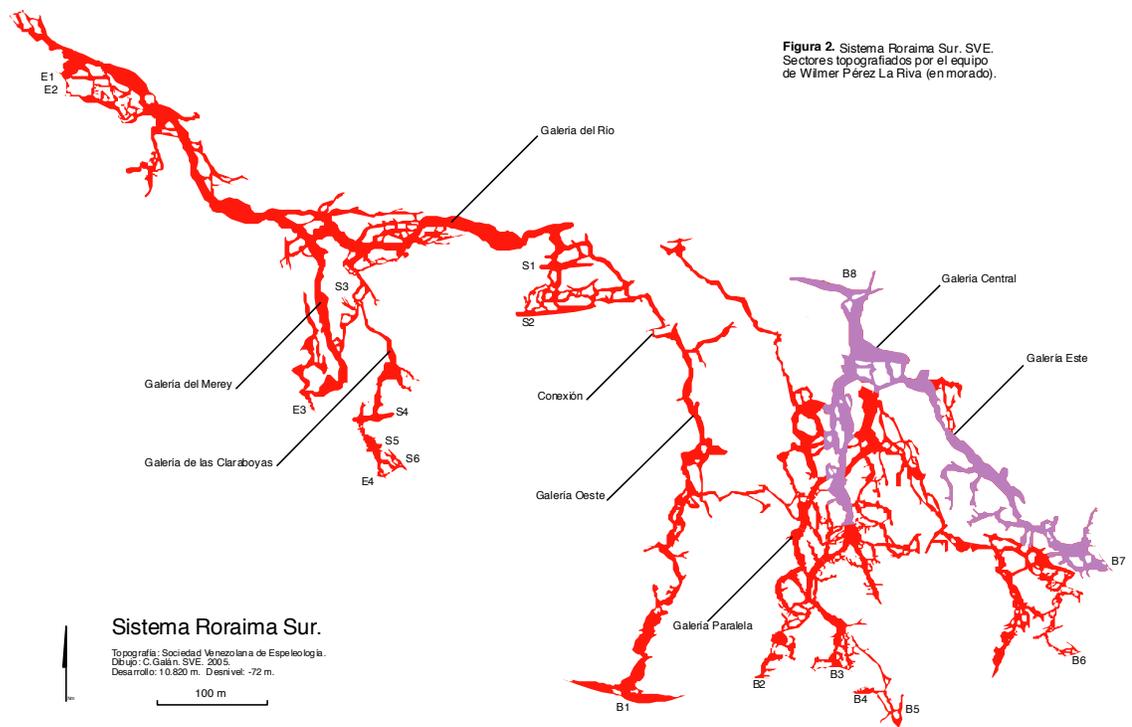


Fig. 4.4. Detail of the Sistema Roraima Sur map highlighting the section my survey team mapped (Computerized Rendition by Carlos Galán).

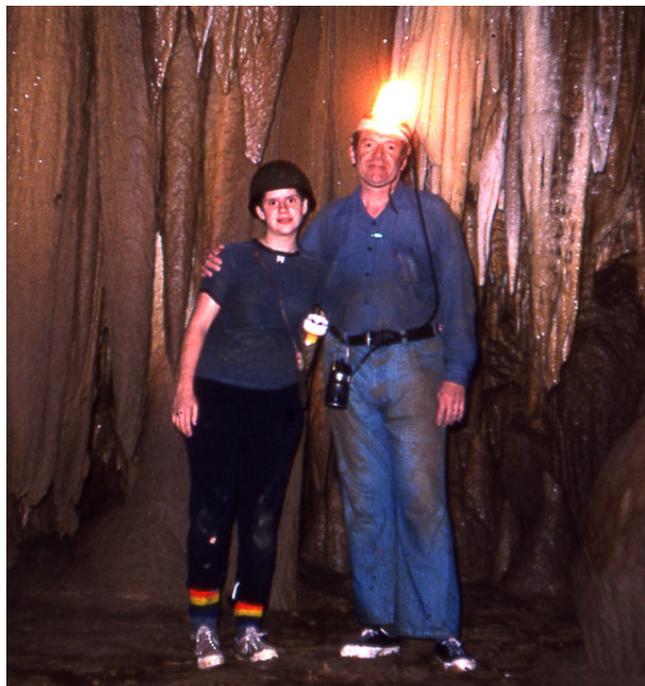
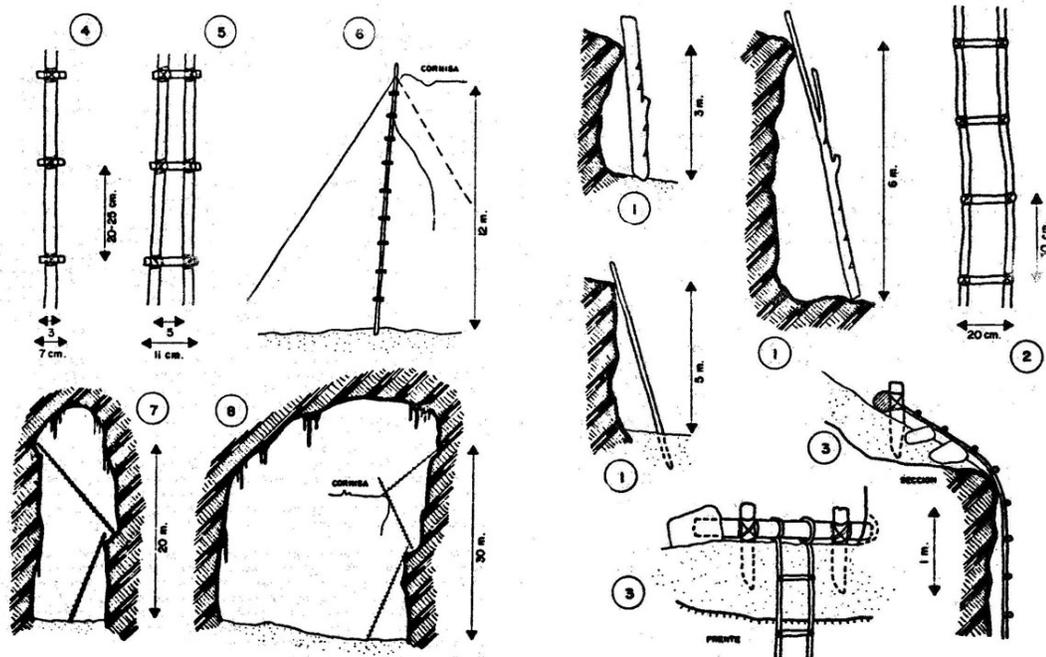
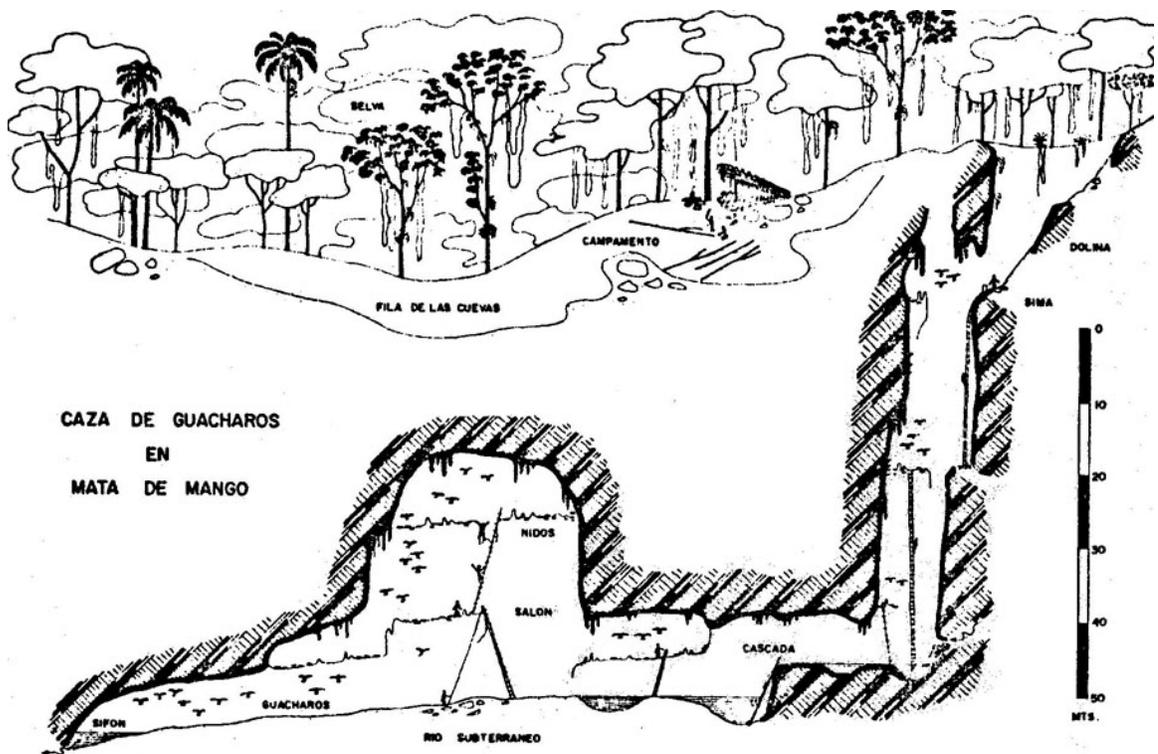


Fig. 5.1. Beatriz and her father, Eugenio de Bellard, in Guácharo Cave, 1984 (Photo by Ramón Alberto Hernández).



- 4.- VARA DE TREPAR SIMPLE.
- 5.- VARA DE TREPAR DOBLE.
- 6.- VARA ATRANTADA CON BEJUCOS.
- 7.- VARAS SUCESIVAS EN ZIGZAG.
- 8.- VARAS SUCESIVAS EN UNA SALA.

- 1.- VARAS PARA SUPERAR ESCALONES.
- 2.- ESCALA DE BEJUCOS.
- 3.- ANCLAJES.



**CAZA DE GUACHAROS
EN
MATA DE MANGO**

Fig. 6.1.a, b, and c. Carlos Galán's sketches of hand-made props used in the caverns of Mata de Mango to hunt for guácharos (Galán 1981:34, 35).



Fig. 6.2. In a 1962 group picture that has become emblematic of a by-gone era, the 8 members of the Speleology Section of the Venezuelan Society of Natural Sciences embody the essence of *the Explorer* (SVE Archives). From left to right: Raúl Alvarado, Eugenio de Bellard, Carlos Bordón, Juan Antonio Tronchoni, Antonio de la Rosa, Dany Adler, Juan Gañán, and Eduardo Schlageter.



Fig. 6.3. Joaquím Astort guides Luz Rodríguez in the placement and reading of the clinometer, Alto de la Palencia, Monagas state, March 2008 (Author's Photo).



Fig. 6.4. Carlos Galán sketches by memory the inner contours of *Sima 2*, Alto de la Palencia, Monagas state, March 2008 (Author's Photo).

Bibliography

- Abramson, Allen, and Robert Fletcher
2007 Recreating the Vertical: Rock-Climbing as Epic and Deep Eco-Play. *Anthropology Today* 23(6):3-7.
- Aitken, Stuart C.
1986 A Phenomenology of Caving. *The Canadian Caver* 18(2):26-29.
- Altez, Rogelio
2006 El desastre de 1812 en Venezuela: Sismos, vulnerabilidades y una patria no tan boba. Caracas: Fundación Empresas Polar, Universidad Católica Andrés Bello.
- Alvarado Jahn, Raul
1966 Geoespeleología básica I: Geología general tema 2. *El Guácharo* 2(1):6-12.
- Alvarado Jahn, Raul, and Julio Lescarbourea
1967 Requisitos indispensables para el establecimiento de una estación microclimática subterránea. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):15-24.
- Anderson, Benedict
1991 *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London: Verso.
- Appadurai, Arjun
1986 Introduction: Commodities and the Politics of Value. *In* *The Social Life of Things: Commodities in Cultural Perspective*. A. Appadurai, ed. Pp. 3-63. Cambridge: Cambridge University Press.
- Arvelo-Jiménez, Nelly
2000 Three Crises in the History of Ye'kuana Cultural Continuity. *Ethnohistory* 47(3-4):731-746.
- Arvelo-Jiménez, Nelly, and Horacio Biord Castillo
1990 La antropología en Venezuela: Balance y perspectivas. *In* *A antropologia na America Latina*. G. de Cerqueira Leite Zarur, ed. Mexico City: Instituto Panamericano de Geografía e Historia.
- Ashmore, Wendy, and Arthur Bernard Knapp
1999 *Archaeologies of Landscape: Contemporary Perspectives*. Malden: Blackwell Publishers.

- Bachelard, Gaston
1994[1969] *The Poetics of Space*. Boston: Beacon Press.
- Bahn, Paul G.
2004 Art in Caves. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 83-84. New York: Fitzroy Dearborn.
- Bahloul, Joelle
1996 *The Architecture of Memory: A Jewish-Muslim Household in Colonial Algeria, 1937-1962*. Cambridge: Cambridge University Press.
- Ballard, Chris, and Glenn Banks
2003 Resource Wars: The Anthropology of Mining. *Annual Review of Anthropology* 32:287-313.
- Bateson, Gregory
1972[1955] *Steps to an Ecology of Mind*. New York: Ballantine.
- Bednarik, Robert
2004 Art in Caves: History. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 85-86. New York: Fitzroy Dearborn.
- Bertarelli, Luigi Vittorio, and Eugenio Boegan
1926 *Duemila Grotte: Quarant'anni di esplorazioni nella Venezia Giulia*. Milan: Touring Club Italiano.
- Biagioli, Mario
1999a Introduction: Science Studies and Its Disciplinary Predicaments. *In The Science Studies Reader*. M. Biagioli, ed. Pp. xi-xviii. New York: Routledge.
1999b *The Science Studies Reader*. New York: Routledge.
- Bille, Mikkel, and Tim Flohr Sørensen
2007 An Anthropology of Luminosity: The Agency of Light. *Journal of Material Culture* 12:263-284.
- Biord Castillo, Horacio
2006 Dinámicas étnicas y demarcación de territorios indígenas en el nororiente de Venezuela. *Antropológica (Revista del Instituto Caribe de Antropología y Sociología, Fundación la Salle de Ciencias Naturales, Caracas)* 105-106:131-160.
- Bonsall, Clive, and Chris Tolan-Smith, eds.
1997 *The Human Use of Caves*. Oxford: Archaeopress.

- Boone, Elizabeth Hill, and Walter Mignolo, eds.
1994 *Writing without Words: Alternative Literacies in Mesoamerica and the Andes*. Durham: Duke University Press.
- Bosque, Carlos
2004 Oilbirds (Steatornithidae). *In* Grzimek's Animal Life Encyclopedia. Vol. 9. Birds II. 2nd Ed. M. Hutchins, A.V. Evans, J.A.J. Jackson, D.G. Kleiman, J.B. Murphy, and D.A. Thoney, eds. Pp. 373-376. Detroit: Gale.
- Bosque, Carlos, Rudyard Ramírez, and Domingo Rodríguez
1995 The Diet of the Oilbird in Venezuela. *Ornitología Neotropical* 6:67-80.
- Bourdieu, Pierre
2000[1972] *Outline of a Theory of Practice*. R. Nice, transl. Volume 16. Cambridge: The University of Cambridge.
- Boyer, Dominic, and Claudio Lomnitz
2005 Intellectuals and Nationalism: Anthropological Engagements. *Annual Review of Anthropology* 34:105-120.
- Brady, James, and Keith Prufer, eds.
2005 *In the Maw of the Earth Monster*. Austin: University of Texas Press.
- Briceño Monzón, Claudio Alberto
2005 Visiones geohistóricas del siglo XIX venezolano en las obras de Alejandro Humboldt, Friedrich Gerstácker y Christian Anton Göering. *Presente y pasado. Revista de Historia* 10(20):88-106.
- Brucker, Roger W., and Richard Watson
1987 *The Longest Cave*. Carbondale: Southern Illinois University Press.
- Burnett, D. Graham
2000 *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado*. Chicago: University of Chicago Press.
- Calderón, Ruiz, ed.
1992 *La ciencia en Venezuela: Pasado, presente y futuro*. Caracas: Cuadernos Lagovén.
- Cañizares-Esguerra, Jorge
2005 How Derivative Was Humboldt? *In* *Colonial Botany: Science, Commerce, and Politics in the Early Modern World*. L.L. Schiebinger and C. Swan, eds. Pp. 148-165. Philadelphia: University of Pennsylvania Press.
- 2006 *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World*. Stanford: Stanford University Press.

- Cant, Sarah G.
 2003 The Tug of Danger with the Magnetism of Mystery: Descent into the Comprehensive, Poetic-Sensuous Appeal of Caves. *Tourist Studies* 3(1):67-81.
- 2006 British Speleologies: Geographies of Science, Personality and Practice, 1935-1953. *Journal of Historical Geography* 32:775-795.
- Carneiro, Ana
 2005 Outside Government Science, 'Not a Single Tiny Bone to Cheer Us Up!' The Geological Survey of Portugal (1857-1908), the Involvement of Common Men, and the Reaction of Civil Society to Geological Research. *Annals of Science* 62(2):141-204.
- Carreño, Rafael
 2004 Soberanía Espeleológica: ¿Competir o Compartir Hallazgos Bajo Tierra? *Boletín de la Sociedad Venezolana de Espeleología* 38:61-64.
- Carrera Damas, Germán
 1972 *Historia contemporánea de Venezuela*. Caracas: Universidad Central de Venezuela.
- Carrera, Magali M.
 2011 *Traveling from New Spain to Mexico: Mapping Practices of Nineteenth-Century Mexico*. Durham and London: Duke University Press.
- Carrillo, José María
 2003 *Academia de Ciencias Físicas, Matemáticas y Naturales: Datos históricos y biográficos*. Caracas: Academia de Ciencias Físicas, Matemáticas y Naturales, Fundación Polar.
- Carsten, Janet
 1995 The Substance of Kinship and the Heat of the Hearth: Feeding, Personhood, and Relatedness among Malays in Pulau Langkawi. *American Ethnologist* 22(2):223-241.
- Carter, Paul
 1988 *The Road to Botany Bay: An Exploration of Landscape and History*. New York: Knopf.
- Casteret, Norbert
 1938 *Ten Years under the Earth*. New York: The Greystone Press.
- Casteret, Norbert
 1961 *Ma vie souterraine: Mémoires d'un spéléologue*. Editions Flammarion.
- Chabert, Claude, and Richard Watson
 1981 Mapping and Measuring Caves: A Conceptual Analysis. *NSS Bulletin* 43:3-11.
- Christen, Catherine A.
 2002 At Home in the Field: Smithsonian Tropical Science Field Stations in the U. S. Panama Canal Zone and the Republic of Panama. *The Americas* 58(4):537-575.

Codazzi, Agustín

1960 Obras escogidas. Colección Biblioteca Venezolana de Cultura, 2 V. Caracas: Ministerio de Educación, Dirección de Cultura y Bellas Artes.

1974[1835] Cueva del Guácharo. *In* Gaceta de Venezuela. Reprinted in El Guácharo vol. 7 (2): 74-79. Pp. 2-4, Vol. 18.

Coronil, Fernando

1995 Introduction to the Duke University Press Edition Transculturation and the Politics of Theory: Countering the Center, Cuban Counterpoint. *In* Cuban Counterpoint: Tobacco and Sugar. Pp. ix-1vi. Durham: Duke University Press.

1996 Beyond Occidentalism: Towards Non-Imperial Geohistorical Categories. *Cultural anthropology* 11(1):51-87.

1997 The Magical State: Nature, Money, and Modernity in Venezuela. Chicago: The University of Chicago Press.

Cosgrove, Denis E.

1999 Introduction: Mapping Meanings. *In* Mappings. Pp. 1 - 23. London: Reaktion Books.

Cosgrove, Denis E., and Veronica Della Dora

2009 High Places: Cultural Geographies of Mountains, Ice and Science. New York: I.B. Tauris & Co.

Craib, Raymond B.

2004 Cartographic Mexico: A History of State Fixations and Fugitive Landscapes. Durham, N.C.: Duke University Press.

Crothers, George, P. Willey, and Patty Jo Watson

2007 Cave Archaeology and the NSS: 1941-2006. *Journal of Cave and Karst Studies* 69(1):27-34.

Csordas, Thomas J.

1994 Introduction: The Body as Representation and Being-in-the-World. *In* Embodiment and Experience: The Existential Ground of Culture and Self. T.J. Csordas, ed. Pp. 1-28. New York: Cambridge University Press.

Cunill Grau, Pedro

2007 Geohistoria de la sensibilidad en Venezuela. Caracas: Fundación Empresas Polar.

Curl, Rane

1964 On the Definition of a Cave. *Bulletin of the National Speleological Society* 2:1-6.

- Damasio, Antonio
 1999 *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. Pp. 386. London: Vintage Press.
- Dant, Tim, and Belinda Wheaton
 2007 Windsurfing: An Extreme Form of Material and Embodied Interaction? *Anthropology Today* 23(6):8-12.
- Darwin, Charles
 1884[1859] *On the Origin of Species by Means of Natural Selection, or, the Preservation of Favored Races in the Struggle for Life*. New York: D. Appleton and Company.
- De Bellard Pietri, Eugenio
 1951 La Cueva del Guácharo. Quince horas en el cuarto del Viento. La gruta del Caribe Vidal. *El Universal*, November 4 and 5: 8, 5.
- 1957 Tercera exploración a la Cueva del Guácharo. *Boletín de la Sociedad Venezolana de Ciencias Naturales* 17:322-331.
- 1957 La Cueva Alfredo Jahn. *In Revista Shell*. Pp. 43-53.
- 1969 Atlas espeleológico de Venezuela. *Boletín de la Academia de Ciencias Físicas, Matemáticas y Naturales* 29(83):1-171.
- 1980 La visita de Alejandro de Humboldt a la Cueva del Guácharo a la luz de los documentos históricos disponibles. *Boletín de la Sociedad Venezolana de Ciencias Naturales* 34(137):355-364.
- De Certeau, Michel
 1984 *The Practice of Everyday Life*. Berkeley: University of California Press.
- De Civrieux, M.
 1998 *Los Chaimas del Guácharo*. Caracas: Editorial del Banco Central de Venezuela.
- de la Peña, Guillermo
 2005 Social and Cultural Policies toward Indigenous Peoples: Perspectives from Latin America. *Annual Review of Anthropology* 34:717-739.
- de Lisio, Antonio
 2005 La idea de la “riqueza natural” en Venezuela: De la leyenda de “El Dorado” a la metáfora de la “Siembra del petróleo. *In Políticas de economía, ambiente y sociedad en tiempos de globalización*. D. Mato, ed. Pp. 211-231. Caracas: Facultad de Ciencias Económicas y Sociales.

- Deleuze, Gilles, and Felix Guattari
1987 *Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press.
- Desjarlais, Robert , and C. Jason Throop
2011 Phenomenological Approaches in Anthropology. *Annual Review of Anthropology* 40.
- Dettelbach, Michael
1996 The Natures of Cultural History. *In Cultures of Natural History*. N. Jardine, J.A. Secord, and E.C. Spary, eds. Pp. 287-304. Cambridge: Cambridge University Press.
- Dietler, M.
1998 Consumption, Agency, and Cultural Entanglement: Theoretical Implications of a Mediterranean Colonial Encounter. *In Studies in Culture Contact: Interaction, Culture Change, and Archaeology*. J.G. Cusick, ed. Pp. 288-308. Carbondale: Center for Archaeological Investigations.
- Driver, Felix
2000 Editorial: Field-Work in Geography. *Transactions of the Institute of British Geographers* 25:267-268.
- Dym, Jordana, and Karl Offen, eds.
2011 *Mapping Latin America: A Cartographic Reader*. Chicago: The University of Chicago Press.
- Eakin, Marshall C.
2002 Guest Editor's Introduction. *The Americas* 58(4):509-511.
- Eavis, Andy
2008 Welcome from the UIS President. 15th International Congress of Speleology. Electronic document, <http://www.ics2009.us/welcome.html>, accessed July 8, 2009.
- Edney, Matthew H.
1999 *Mapping an Empire: The Geographical Construction of British India, 1765-1843*. Oxford: Oxford University Press.
- Eliade, Mircea
1962 *The Forge and the Crucible*. S. Corrin, transl. New York: Harper & Brothers.
- Escobar, Arturo
1996 Constructing Nature: Elements for a Post-Structuralist Political Ecology. *Futures* 28(4):325-343.
- 1999 After Nature: Steps to an Antiessentialist Political Ecology. *Current Anthropology* 40(1):1-30.

- Eshleman, Clayton
2003 *Juniper Fuse: Upper Paleolithic Imagination & the Construction of the Underworld*. Middletown: Wesleyan University Press.
- Fabian, Johannes
2000 *Out of Our Minds: Reason and Madness in the Exploration of Central Africa*. Berkeley: University of California Press.
- Feeley-Harnik, Gillian
2001 *Ravenala Madagascariensis* Sonnerat: The Historical Ecology of a "Flagship Species" in Madagascar. *Ethnohistory* 48(1-2):32-86.
- Feinberg, Benjamin
2003 *The Devil's Book of Culture: History, Mushrooms, and Caves in Southern Mexico*. Austin: University of Texas Press.
- Ferry, Elizabeth
2005 *Not Ours Alone: Patrimony, Value, and Collectivity in Contemporary Mexico*. New York: Columbia University Press.
- Ford, Derek C.
2004 Karst. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. New York: Fitzroy Dearborn.
- Forti, Paolo
1998 Antonio Núñez Jiménez (1923-1998). *Boletín de la Sociedad Venezolana de Espeleología* 32:66-67.
- Foucault, Michel
1973 *The Order of Things: An Archaeology of the Human Sciences*. New York: Vintage Books.
- Fricke, Tom
2004 *Taking Culture Seriously: Making the Social Survey Ethnographic*. *In Discovering Successful Pathways in Children's Development*. T.S. Weisner, ed. Pp. 185-221. Chicago: University of Chicago Press.
- Galán, Carlos
1981 Técnicas de exploración utilizadas en la caza de guácharos. *El Guácharo* 21:28-35.

1991 El karst de la Fila de las Cuevas (Zona kárstica de Mata de Mango), Monagas, Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 25:1-14.

2001 Obituario de Domingo Maita (1920-2001). *Boletín de la Sociedad Venezolana de Espeleología* 35:70-71.

- Ganter, John
1988 Will We Map as We Survey? *Compass and Tape* 5(4):65-66.
- Garbisu, Oscar, and Miguel Angel Perera
1967 La Cueva Lizardo. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):45-52.
- Gibson, J. J.
1979 *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Glassman, Mark
2004 In Croatia, Explorers Make a Deep Discovery. *The New York Times*, August 17, 2004.
- Godoy, Richard
1985 Mining: Anthropological Perspectives. *Annual Review of Anthropology* 14:199-218.
- Goodenough, Elizabeth, ed.
2003 *The Secret Spaces of Childhood*. Ann Arbor: University of Michigan Press.
- Gordon, Robert J.
2006 Introduction. *In Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure*. L.A. Vivanco and R.J. Gordon, eds. Pp. 1-26. New York: Berhahn Books.
- Gudeman, Stephen, and Alberto Rivera
1990 *Conversations in Colombia: The Domestic Economy in Life and Text*. New York: Cambridge University Press.
- Habermas, Jurgen, Sara Lennox, and Frank Lennox
1974 The Public Sphere: An Encyclopedia Article (1964). *New German Critique* 3:49-55.
- Hacking, Ian
2001 *The Social Construction of What?* Cambridge: Harvard University Press.
- Hamilton-Smith, Elery
2004 Tourist Caves. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 726-729. New York: Fitzroy Dearborn.
- Harley, J. B.
1989 Deconstructing the Map. *Cartographica* 26(2):1-20.
- Harvey, D. C.
2003 'National' Identities and the Politics of Ancient Heritage: Continuity and Change at Ancient Monuments in Britain and Ireland, C.1675-1850. *Transactions of the Institute of British Geographers* 28(4):473-487.

- Hayden, Cori
 2003 *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*. Princeton: Princeton University Press.
- Helmreich, Stefan
 2007 *An Anthropologist Underwater: Immersive Soundscapes, Submarine Cyborgs, and Transductive Ethnography*. *American Ethnologist* 34(4):621-641.
- Henson, Pamela M.
 2002 *Invading Arcadia: Women Scientists in the Field in Latin America, 1900-1950*. *The Americas* 58(4):577-600.
- Hevly, Bruce
 1996 *The Heroic Science of Glacier Motion*. *Osiris, 2nd Series, Science in the Field* 11:66-86.
- Heyden, Doris
 1975 *An Interpretation of the Cave Underneath the Pyramid of the Sun in Teotihuacan, Mexico*. *American Antiquity* 40(2):131-147.
- Hill, Jonathan D.
 2000 *Colonial Transformations in Venezuela*. *Ethnohistory* 47(3-4):747-754.
- Houston, David
 2006 *Five Miles Out: Communion and Commodification among the Mountaineers*. *In Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure*. L.A. Vivanco and R.J. Gordon, eds. Pp. 147-160. New York: Berhahn Books.
- Hull, Matthew
 2003 *Paper Travails: Agency, Authority, and Autography in a Pakistan Bureaucracy*. *Language and Communication* 23:287-314.
- Humboldt, Alexander von
 1966[1818] *Personal Narrative of Travels to the Equinoctial Regions of the New Continent During the Years 1799-1804*. H.M. Williams, transl. Volume III. New York: AMS Press, INC.
 1981[1817] *Sobre el Steatornis, nuevo género de ave nocturna*. Traducción de María Eugenia Esparragosa y Omar Linares. *In El Guácharo*. Pp. 21-22, Vol. 20. Caracas: Sociedad Venezolana de Espeleología.
- Hutchins, Ed
 1995 *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Ingold, Tim
 2000 *The Perception of the Environment: Essay in Livelihood, Dwelling and Skill*. London: Routledge.

- 2005 The Eye of the Storm: Visual Perception and the Weather. *Visual Studies* 20(2):97-104.
- 2007 *Lines: A Brief History*. New York: Routledge.
- Jackson, Jean E., and Kay B. Warren
 2005 Indigenous Movements in Latin America, 1992-2004: Controversies, Ironies, New Directions. *Annual Review of Anthropology* 34:549-573.
- Jackson, Michael
 1989 *Paths toward a Clearing: Radical Empiricism and Ethnographic Inquiry*. Bloomington: Indiana University Press.
- 1996 *Things as They Are: New Directions in Phenomenological Anthropology*. Bloomington: Indiana University Press.
- Jardine, Nicholas, and E. C. Spary
 1996 The Natures of Cultural History. *In Cultures of Natural History*. N. Jardine, J.A. Secord, and E.C. Spary, eds. Pp. 3-13. Cambridge: Cambridge University Press.
- Johnson, Nuala
 1995 Cast in Stone: Monuments, Geography and Nationalism. *Society and Space* 13:51-65.
- Keane, Webb
 1997 *Signs of Recognition: Powers and Hazards of Representation in an Indonesian Society*. Berkeley: University of California Press.
- 2003a Self-Interpretation, Agency, and the Objects of Anthropology: Reflections on a Genealogy. *Society for Comparative Study of Society and History* 3:222-248.
- 2003b Semiotics and the Social Analysis of Material Things. *Language and Communication* 23(3-4):409-425.
- Kennedy, Alasdair
 2008 In Search of the 'True Prospect': Making and Knowing the Giant's Causeway as a Field Site in the Seventeenth Century. *British Journal for the History of Science* 41(1):19-41.
- Klimchouk, Alexander
 2004 Caves. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 203-205. New York: Fitzroy Dearborn.
- Kuklick, Henrika, and Robert E. Kohler
 1996 Introduction. *Osiris, 2nd Series, Science in the Field* 11:1-14.

- Lafuente, Antonio, and Leoncio López-Ocón
 2006 Chapter 4: Scientific Traditions and Enlightenment Expeditions in Eighteenth-Century Hispanic America. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 123 - 150. Austin: University of Texas Press.
- Latour, Bruno
 1988 *The Pasteurization of France*. Cambridge, Mass.: Harvard University Press.
- 1999 *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge: Harvard University Press.
- Law, John, and Annemarie Mol, eds.
 2006 *Complexities: Social Studies of Knowledge Practices*. Durham: Duke University Press.
- Leder, Drew
 1990 *The Absent Body*. Chicago: University of Chicago Press.
- Leigh Star, Susan, and James R. Griesemer
 1999[1989] Institutional Ecology, "Translation," and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *In The Science Studies Reader*. M. Biagioli, ed. Pp. 505-524. New York: Routledge.
- Lévi-Strauss, Claude
 1992[1955] *Tristes Tropiques*. J.a.D. Weightman, transl. New York: Penguin Books.
- Linares, Omar
 1967 Extensión de distribución para "*Lonchophylla robusta*". *Boletín de la Sociedad Venezolana de Espeleología* 1(1):53-60.
- Livingstone, David N.
 2003 *Putting Science in Its Place: Geographies of Scientific Knowledge*. Chicago: University of Chicago Press.
- Lorimer, Hayden
 2005 Cultural Geography: The Busyness of Being 'More-Than-Representational' Progress in Human Geography *Compass* 29(1):83-94.
- Lorimer, Hayden, and Nick Spedding
 2005 Locating Field Science: A Geographical Family Expedition to Glen Roy, Scotland. *British Journal for the History of Science* 38(136):13-34.
- Lozoya, Xavier
 2006 Chapter 1: Natural History and Herbal Medicine in Sixteenth-Century America. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 29-50. Austin: University of Texas Press.

- Lynch, Martin
2002 *Mining in World History*. London: Reaktion Books.
- Lynch, Michael, and John Law
1988 Lists, Field Guides, and the Descriptive Organization of Seeing: Birdwatching as an Exemplary Observational Activity. *Human Studies* 11(2-3):271-303.
- 1999[1988] Pictures, Text, and Objects: The Literary Language Game of Bird-Watching. *In* The Science Studies Reader. M. Biagioli, ed. Pp. 317-341. New York: Routledge.
- MacLaren, I.S., Eric Higgs, and Gabrielle Zezulka-Mailloux
2005 *Mapper of Mountains: M.P. Brdglan in the Canadian Rockies 1902-1930*. Edmonton: The University of Alberta Press.
- MacLeod, Barbara, and Dennis Puleston
1978 Pathways into Darkness: The Search for the Road to Xibalbá. *In* Teresa Mesa Redonda de Palenque. M.G. Robertson and D.C. Jeffers, eds. Pp. 71-77. Monterey: Hearld Peters.
- Macpherson, Hannah
2010 Non-Representational Approaches to Body–Landscape Relations. *Geography Compass* 4(1):1-13.
- Maldonado, Marta M., Manuel Valdés-Pizzini, and Alfonso R. Latoni
1999 Owning and Contesting El Yunque: Forest Resources, Politics, and Culture in Puerto Rico. *Berkeley Journal of Sociology: A Critical Review* 44:82-101.
- Mancini, Massimo , and Paolo Forti
2009 The Oldest Printed Cave Maps in the World 15th International Congress of Speleology, Kerrville, Texas, 2009. Vol. 3, pp. 2011.
- Massey, Doreen B.
2005 *For Space*. Thousand Oaks: Sage.
- Matthews, W. H.
1922 *Mazes and Labyrinths: A General Account of Their History and Developments*. London: Longmans, Green.
- Mauss, Marcel
1973[1950] Techniques of the Body. *Economy and Society* 2(1):70-88.
- McCook, Stuart
2002 'Giving Plants a Civil Status': Scientific Representations of Nature and Nation in Costa Rica and Venezuela, 1885-1935. *The Americas* 58(4):513-536.
- Merleau-Ponty, Maurice
2005[1945] *Phenomenology of Perception*. C. Smith, transl. New York: Routledge Classics.

- Mignolo, Walter
2005 *The Idea of Latin America*. Malden: Blackwell Publishers.
- Mintz, Sidney W.
1985 *Sweetness and Power: The Place of Sugar in Modern History*. New York: Penguin Books.
- Mlekuž, Dimitrij
2011 What Can Bodies Do? Bodies and Caves in the Karst Neolithic. *Documenta Praehistorica* 38:1-11.
- Mol, Annemarie
2002 *The Body Multiple: Ontology in Medical Practice*. Durham and London: Duke University Press.
- Mueggler, Erik
2001 *The Age of Wild Ghosts: Memory, Violence, and Place in Southwest China*. Berkeley: University of California Press.
- 2005a *The Lapponicum Sea: Matter, Sense, and Affect in the Botanical Exploration of Southwest China and Tibet*. *Society for Comparative Study of Society and History*:442-479.
- 2005b *Reading, Glaciers, and Love in the Botanical Exploration of China's Borderlands*. *Michigan Quarterly Review* 44(4):722-754.
- 2011 *Bodies Real and Virtual: Joseph Rock and Enrico Caruso in the Sino-Tibetan Borderlands*. *Comparative Studies in Society and History* 53(1):6-37.
- Nader, Laura
1969 *Up the Anthropologist—Perspectives Gained from Studying Up*. In *Reinventing Anthropology*. D.H. Hymes, ed. Pp. 284-311. New York: Pantheon Books.
- Nagel, Thomas
1986 *The View from Nowhere*. New York: Oxford University Press.
- Naylor, Simon
2003 *Introduction: Historical Geographies of Science - Places, Contexts, Cartographies*. *British Journal for the History of Science* 38(136):1-13.
- Nerlich, Michael
1987 *Ideology of Adventure: Studies in Modern Consciousness, 1100-1750*. 2 vols. R. Crowley, transl. Minneapolis: University of Minnesota Press.

- Ness, Sally Ann
2011 Bouldering in Yosemite: Emergent Signs of Place and Landscape. *American Anthropologist* 113(1):71-87.
- North, Leslie
2011 Informal Karst Education in the United States and Internationally. *Geography*, University of South Florida.
- Olwig, Kenneth
2002 Landscape, Nature, and the Body Politic: From Britain's Renaissance to America's New World. Madison: The University of Wisconsin Press.
- Ortiz, Fernando
2001[1940] *Cuban Counterpoint: Tobacco and Sugar*. H.P. Vila, transl. Durham: Duke University Press.
- Ortner, Sherry
1984 Theory in Anthropology since the Sixties. *Comparative Studies in Society and History* 26:126-66.

1999 *Life and Death on Mt. Everest: Sherpas and Himalayan Mountaineering*. Princeton, N.J.: Princeton University Press.

2001 Commentary: Practice, Power and the Past. *Journal of Social Archaeology* 1(2):271-278.
- Palmer, Catherine
2002 'Shit Happens': The Selling of Risk in Extreme Sports. *The Australian Journal of Anthropology* 13(3):323.
- Parrish, Susan Scott
2006 *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World*. Chapel Hill: University of North Carolina Press.
- Peluso, Nancy
1995 Whose Woods Are These? Counter-Mapping Forest Territories in Kalimantan, Indonesia. *Antipode* 27(4):383-406.
- Peñalver Bermúdez, Luis
1993 *Los Chaimas*. Maturín: LitOriente, C.A.
- Pereda Núñez, José
2007 *Fundación La Salle de Ciencias Naturales: Un Modelo Científico-Educativo que Favorece la "Opción Preferencial Por los Pobres"*. Roma: Hermanos de las Escuelas Cristianas.

- Perera, Miguel Angel
 1976a Editorial. *Boletín de la Sociedad Venezolana de Espeleología* 7(14):127-128.
- 1976b Notas sobre una excavación en la Cueva del Guácharo (Mo. 1), Estado Monagas, Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 7(14):249-265.
- 1988 La espeleología histórica en la antropología nacional: Logros y perspectivas (veinte años de actividades 1967-1987). *Boletín de la Sociedad Venezolana de Espeleología* 23:17-29.
- Pérez, María A., and Govinda Galindo
 2009 The Guides of Venezuela's Guácharo Cave: A Historical and Ethnographic Study of Locals' Contribution to Its Promotion, Exploration, and Conservation. 15th International Congress of Speleology, Kerrville, Texas, 2009. Vol. 2, pp. 1202-1207. Greyhound Press.
- Pérez, Wilmer
 1966 Una nota en el estudio bioespeleológico: La micosis. *El Guácharo* 2(1):3-5.
- Pohl, Mary, and John Pohl
 1983 Ancient Maya Cave Ritual. *Archaeology* 36(3):28-51.
- Pratt, Mary Louise
 1992 *Imperial Eyes: Travel Writing and Transculturation*. New York: Routledge.
- Radcliffe, Sarah A., and Sallie Westwood
 1996 *Remaking the Nation: Place, Identity and Politics in Latin America*. New York: Routledge.
- Raffles, Hugh
 1999 "Local Theory": Nature and the Making of an Amazonian Place. *Cultural Anthropology* 14(3):323-360.
- 2002a *In Amazonia: A Natural History*. Princeton: Princeton University Press.
- 2002b *Intimate Knowledge*. *ISSJ* 173:325-335.
- Ranger, Terrence O.
 1999 *Voices from the Rocks: Nature, Culture & History in the Matopos Hills of Zimbabwe*. Bloomington: Indiana University Press.
- Reig, Alejandro
 2006/2007 The Orinoco Headwaters Expedition as a Turning Point in the Development of External Territorializations of the Venezuelan Amazon. *Cambridge Anthropology* 26(2):57-68.

- Rogelio León, Domingo, and Rudy Mostacero Villarreal
1997 *Caripe: Historia Cotidiana y Oralidad*. Maturin: Ediciones Gobernación del Estado Monagas.
- Romero, Simón
2006 For an Ex-Dentist, the Age of Exploration Treks On. *The New York Times*, August 26, 2006: 4.
- Ronquillo, Wilfredo
1995 Anthropological and Cultural Values of Caves. *Philippine Quarterly of Culture and Society* 23:138-150.
- Rose, Mitch
2002 Landscape and Labyrinths. *Geoforum* 33(4):455-467.
- Rubenstein, Robert J.
2006 A Head for Adventure. *In Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure*. L.A. Vivanco and R.J. Gordon, eds. Pp. 235-254. New York: Berhahn Books.
- Rudwick, Martin
1989 Encounters with Adam, or at Least the Hyaenas: Nineteenth-Century Visual Representations of the Deep Past. *In History, Humanity, and Evolution: Essays for John C. Green*. J.R. Moore, ed. Pp. 231-251. Cambridge: Cambridge University Press.
- Sack, Robert David
1986 *Human Territoriality: Its Theory and History*. Cambridge: Cambridge University Press.
- Sahlins, Marshall
1985 *Islands of History*. Volume University of Chicago Press: Chicago.

1995 *How 'Natives' Think: About Captain Cook, for Example*. Chicago: University of Chicago Press.
- Saldaña, Juan José, ed.
2006a *Science in Latin America: A History*. Austin: University of Texas Press.

2006b Chapter 2: Science and Public Happiness During the Latin American Enlightenment *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 51 - 92. Austin: University of Texas Press.

2006c Introduction: The Latin American Scientific Theater. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 1-27. Austin: University of Texas Press.

- 2006d Chapter 5: Science and Freedom: Science and Technology as a Policy of the New American States. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 151 - 162. Austin: University of Texas Press.
- Scaramelli, Franz, and Kay Tarble
 2005 The Roles of Material Culture in the Colonization of the Orinoco, Venezuela. *The Journal of Social Archaeology* 5(1):135-168.
- 2000 Cultural Change and Identity in Mapoyo Burial Practice in the Middle Orinoco, Venezuela. *Ethnohistory* 47(3-4):705-729.
- Scaramelli, Franz, and Bernardo Urbani
 2006 Historia antropoespeleológica de la Sociedad Venezolana de Espeleología: Un recorrido de 40 años. *Boletín de la Sociedad Venezolana de Espeleología* 40:17-33.
- Schaper, Jo
 2003 Webster's Home Cave: Speleologist, Spelunker or Caver? Electronic document, <http://members.socket.net/~joschaper/wspelunk.html>, accessed September 19, 2011.
- Schiebinger, Londa L., and Claudia Swan
 2005 *Colonial Botany: Science, Commerce, and Politics in the Early Modern World*. Philadelphia: University of Pennsylvania Press.
- Schut, Pierre-Olaf
 2006 E. A. Martel, the Traveller Who Almost Became an Academician. *Acta Carsologica* 35(1):149-157.
- Scott, James C.
 1998 *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.
- Secord, Anne
 2002 Botany on a Plate: Pleasure and the Power of Pictures in Promoting Early Nineteenth-Century Scientific Knowledge. *Isis* 93(1):28-57.
- Shapin, Steven
 1999[1988] The House Experiment in Seventeenth-Century England. *In The Science Studies Reader*. M. Biagioli, ed. Pp. 479-504. New York: Routledge.
- 1998 Placing the View from Nowhere: Historical and Sociological Problems in the Location of Science. *Transactions of the Institute of British Geographers* 23(1):5-12.
- Shapin, Steven, and Simon Schaffer
 1985 *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton, N.J.: Princeton University Press.

Shaw, Trevor

1979 *History of Cave Science: The Exploration and Study of Limestone Caves, to 1900*.
Crymch: Sydney Speleological Society.

1978 Adolf Schmidl (1802-1863) the Father of Modern Speleology? *International Journal of Speleology* 10(3-4):253-267.

2000 Views on Cave Formation before 1900. *In* *Speleogenesis: Evolution of Karst Aquifers*.
A. Klimchouk, D.C. Ford, A.N. Palmer, and W. Dreybrodt, eds. Pp. 21-29. Huntsville:
National Speleological Society.

Sheets-Johnstone, Maxine

1990 *The Roots of Thinking*. Philadelphia: Temple University Press.

Short, John Rennie

2009 *Cartographic Encounters: Indigenous Peoples and the Exploration of the New World*.
London: Reaktion Books.

Shortland, Michael

1994 Darkness Visible: Underground Culture in the Golden Age of Geology. *History of Science* 32:1-61.

Simmel, Georg

1997 The Adventure. *In* *Simmel on Culture*. D. Frisby and M. Featherstone, eds. Pp. 221-232.
London: Sage.

Skurski, Julie

1993 *The Leader and the "People": Representing the Nation in Postcolonial Venezuela*,
Anthropology, University of Chicago.

Smida, Branislav, Marek Audy, and Lukas Vlcek

2003 *Expedicia Roraima 2003, Venezuela: Jaskyna Krystalove Oci*. *Spravodaj SSS*:192.

Smith, Jessica M.

2009 *Putting Kinship to Work: Gender and Relatedness in a Wyoming Coal Mining Community*. Ph.D. dissertation, Department of Anthropology, University of Michigan.

Spivak, Gayatri Chakravorty

1988 Can the Subaltern Speak? *In* *Marxism and the Interpretation of Culture*. C. Nelson and L.
Grossberg, eds. Pp. 271-313. Urbana: University of Illinois Press.

Stebbins, Robert A.

2007 *Serious Leisure: A Perspective for Our Time*. New Brunswick, NJ: Transaction Publishers.

Stierman, Donald

2004 Geophysical Detection of Caves and Karstic Voids. *In* Encyclopedia of Caves and Karst Science. J. Gunn, ed. Pp. 377-379. New York: Fitzroy Dearborn.

Stoler, Ann Laura

1991 Carnal Knowledge and Imperial Power: Gender, Race, and Morality in Colonial Asia. *In* Gender at the Crossroad of Knowledge: Feminist Anthropology in the Postmodern Era. M. di Leonardo, ed. Berkeley: University of California Press.

Stoll, David

2006 Adventure and Regulation in Contemporary Anthropological Fieldwork. *In* Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure. L.A. Vivanco and R.J. Gordon, eds. Pp. 270-279. New York: Berhahn Books.

Stone, William, Barbara am Ende, and Monte Paulsen

2002 Beyond the Deep: The Deadly Descent into the World's Most Treacherous Cave. New York: Warner Books.

SVE

1967 Mi. 2 Cueva Walter Dupouy. Boletín de la Sociedad Venezolana de Espeleología 1(1):40-41.

1968 Mo. 1 Cueva del Guácharo. Boletín de la Sociedad Venezolana de Espeleología 1(2):97-107.

1971 Mo. 1 Cueva del Guácharo - 2nda parte. Boletín de la Sociedad Venezolana de Espeleología 3(2):116-131.

1973a Noticiero espeleológico: Expedición al Alto Guasare, Estado Zulia. Boletín de la Sociedad Venezolana de Espeleología 8(15):115-120.

1973b Mi. 35 Cueva Alfredo Jahn. Boletín de la Sociedad Venezolana de Espeleología 4(1):63-72.

1975 Mi. 2 Cueva Walter Dupouy. Boletín de la Sociedad Venezolana de Espeleología 6(12):114-119.

1977 Mo. 15 - Sima del Bastimento No. 1. Boletín de la Sociedad Venezolana de Espeleología 8(16):225-226.

1982 Mo. 40 - Sima Los Gonzáles. Boletín de la Sociedad Venezolana de Espeleología 10(19):205-209.

1996 Cueva del Samán. Boletín de la Sociedad Venezolana de Espeleología 25:34-39.

- 2004 Bo. 93 - Sistema Roraima Sur. Boletín de la Sociedad Venezolana de Espeleología 38:34-41.
- 2005 Posición de la comunidad espeleológica de Venezuela ante la UIS con relación a la violación del Código de Ética por espeleólogos de Eslovaquia y la República Checa. Boletín de la Sociedad Venezolana de Espeleología 39:80-81.
- Taussig, Michael
1980 *The Devil and the Commodity Fetishism in South America*. Chapel Hill: The University of North Carolina Press.
- Tauste, Francisco
1964[1678] Misión de los religiosos Capuchinos de la Provincia de Aragón en la Provincia de Cumaná. *In* Los primeros historiadores de la misiones Capuchinas en Venezuela. Pp. 79-254. Col. Biblioteca de la Academia Nacional de la Historia. Caracas: Academia Nacional de la Historia.
- 1680 *Arte y Bocabulario de la lengua de los indios Chayma, Cvmanagotos, Cores, Paria y otros diversos de la Provincia de Cvmaná o Nveva Andalvcía*. Madrid: Bernardo Villadiego.
- Taylor, Michael Ray
1996 *Cave Passages: Roaming the Underground Wilderness*. New York: Vintage Departures.
- Taylor, Michael Ray
1999 *Dark Life*. New York: Scribner.
- Taylor, Peter Lane
2004 *Off the Face of the Earth*. *In* *Adventure*.
- Texera Arnal, Yolanda
2002 The Beginnings of Modern Ornithology in Venezuela. *The Americas* 58(4):601-622.
- 2003 *La zoología en Venezuela 1936-1970: Una historia social*. Caracas: Universidad Central de Venezuela Vicerrectorado Académico, Fundación Polar.
- Thompson, Eric
1959 The Role of Caves in Maya Culture. *Mitteilungen aus dem Museum für Vökerkunde in Hamburg* 25:122-129.
- Thrift, N. J.
1996 *Spatial Formations*. London: Sage.
- Tolan-Smith, Chris, and Clive Bonsall
1997 The Human Use of Caves. *In* *The Human Use of Caves*. C. Bonsall and C. Tolan-Smith, eds. Pp. 217-218. Oxford: Archaeopress.

Trautmann, Thomas

1992 The Revolution in Ethnological Time. *Man* n.s.(27):379-397.

Tronchoni, Juan Antonio

1969 Editorial. *Boletín de la Sociedad Venezolana de Espeleología* II(1):3.

Tschümperlin, Erwin

2011 The Hoelloch Cave – History. 2011: AGH Association. Electronic document, http://www.hoellochforschung.ch/web/index.php?option=com_content&view=category&layout=blog&id=24&Itemid=41&lang=en, accessed June 16, 2011

UIS

2009 UIS Code of Ethics for Cave Exploration and Science in Foreign Countries. 2009. Electronic document, <http://www.uis-speleo.org/ethic-en.html>, accessed July 8, 2009.

Urbani, Franco

1967a La Sima del Agua Dulce. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):5-10.

1967b Las espeleotemas. *Boletín de la Sociedad Venezolana de Espeleología* 1(1):23-24.

1969 Traducción de Pietro Jansen (1931) "Grotte e caverne del Venezuela". *La vie d'Italie e dell' America Latina*, 31 (3):287-290. *Boletín de la Sociedad Venezolana de Espeleología* 2(1):79-82.

1977 Nuevos comentarios sobre estudios realizados en las formas cársticas de las cuarcitas del Grupo Roraima, abril 1977. *Boletín de la Sociedad Venezolana de Espeleología* 8(15):71-77.

1984 Vida y obra de los iniciadores de la espeleología en Venezuela. Parte 3. John Princep, José María del Real, Alexander Walker, Francisco Zea, Pál Rosti, Simón Ugarte, Achille Müntz y Bonifacio Marcano. *Boletín de la Sociedad Venezolana de Espeleología* 21:33-50.

1993 Vida y obra de los iniciadores de la espeleología en Venezuela. Parte 5. Siglos XV al XVII. *Boletín de la Sociedad Venezolana de Espeleología* 27:7-13.

1996 Vida y obra de los iniciadores de la espeleología en Venezuela. Parte 7. Siglos XVI al XVIII. *Boletín de la Sociedad Venezolana de Espeleología* 30:38-55.

1999 Historia espeleológica Venezolana. Parte 10. Una cronología de la Cueva del Guácharo. *Boletín de la Sociedad Venezolana de Espeleología* 33:51-69.

2005a Historia espeleológica Venezolana. Part 12. Adiciones a la bibliografía y cronología de la Cueva del Guácharo. *Boletín de la Sociedad Venezolana de Espeleología* 39:2-9.

- 2005b Alejandro de Humboldt, 1799-1800: Precursor de la espeleología de Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 39:56-58.
- Urbani, Franco, and Max Furrer
2007 "Caripe y la Cueva del Guácharo" Por el Dr. Alfred Scharffenorth, 1890. *Terra* 23:129-146.
- Urbani, Franco, Carlos Galán, and Francisco Herrera
2006 55 Años de exploraciones espeleológicas en Venezuela. *Boletín de la Sociedad Venezolana de Espeleología* 40:17-33.
- Urbani, Franco, and Eugenio Szczerban
1974 Carsos de Venezuela. Parte 4: Formas cársicas en arenisca precámbricas del Territorio Federal Amazonas y Estado Bolívar. *Boletín de la Sociedad Venezolana de Espeleología* 5(1):27-54.
- Valencia Ramírez, Cristóbal
2006 Venezuela in the Eye of the Hurricane: Landing an Analysis of the Bolivarian Revolution. *Journal of Latin American Anthropology* 11(1):173-186.
- Vessuri, Hebe
1999 Los viajes de G.G. Simpson a Sudamérica: Visión científica y experiencia subjetiva. *REDES* 6(14).
- 2006 Chapter 7: Academic Science in Twentieth-Century Latin America. *In Science in Latin America: A History*. J.J. Saldaña, ed. Pp. 163 - 231. Austin: University of Texas Press.
- Vessuri, Hebe, and Margarita Safar
1983 Elementos para la historia social de la química en Venezuela: La Sociedad Venezolana de Química. *In La Ciencia Periférica: Ciencia y Sociedad en Venezuela*. E. Díaz, Y. Texera, and H. Vessuri, eds. Pp. 121-165s. Caracas: Monte Ávila.
- Viloria, Ángel
2002 Episodios en la naturaleza limítrofe. Cali: Panamericana Formas e Impresos.
- Vivanco, Luis Antonio, and Robert J. Gordon
2006 Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure. New York: Berhahn Books.
- Warren, Kay B., and Jean E. Jackson
2002 Indigenous Movements, Self-Representation, and the State in Latin America. Austin: University of Texas Press.
- Watson, Patty Jo, ed.
1974 The Archeology of the Mammoth Cave Area. New York: Academic Press.

- Watson, Richard
1994 *Caving*. Saint Louis: Cave Books.
- Williams, Rosalind
2008 *Notes on the Underground: An Essay on Technology, Society, and the Imagination*. Cambridge: MIT Press.
- Winichakul, Thongchai
1994 *Siam Mapped: A History of the Geo-Body of a Nation*. Honolulu: University of Hawaii Press.
- Withers, Charles W. J.
2004 Memory and the History of Geographical Knowledge: The Commemoration of Mungo Park, African Explorer. *Journal of Historical Geography* 30(2):316-339.
- Withers, C.W.J. and D.A. Finnegan
2003 Natural History Societies, Fieldwork and Local Knowledge in Nineteenth-Century Scotland: Towards a Historical Geography of Civic Science. *Cultural Geographies* 10(3):334-353.
- Wolf, Eric
1982 *Europe and the People without History*. Berkeley: University of California Press.

1988 *Inventing Society*. *American Ethnologist* 15(4):752-761.
- Wood, David
1992 *The Power of Maps*. New York: The Guilford Press.
- Wookey
2004 *Surveying Caves*. *In Encyclopedia of Caves and Karst Science*. J. Gunn, ed. Pp. 714-717. New York: Fitzroy Dearborn.
- Wray, Robert A. L.
1997 *Quartzite Dissolution: Karst or Pseudokarst?* *Cave and Karst Science* 24(2):81-86.
- Wray, Robert A. L.
2010 *The Gran Sabana: The World's Finest Quartzite Karst?* *In Geomorphological Landscapes of the World*. P. Migon, ed. Pp. 79-88. Dordrecht: Springer+Science and Business Media.
- Yanagisako, Sylvia Junko
2002 *Producing Culture and Capital: Family Firms in Italy*. Princeton: Princeton University Press.

Yengoyan, Aram M.

2006 Simmel and Frazer: The Adventure and the Adventurer. *In* Tarzan Was an Eco-Tourist... And Other Tales in the Anthropology of Adventure. L.A. Vivanco and R.J. Gordon, eds. Pp. 27-42. New York: Berhahn Books.

Yusoff, Kathryn

2007 Antarctic Exposure: Archives of the Feeling Body. *Cultural Geographies* 14(2):211-233.