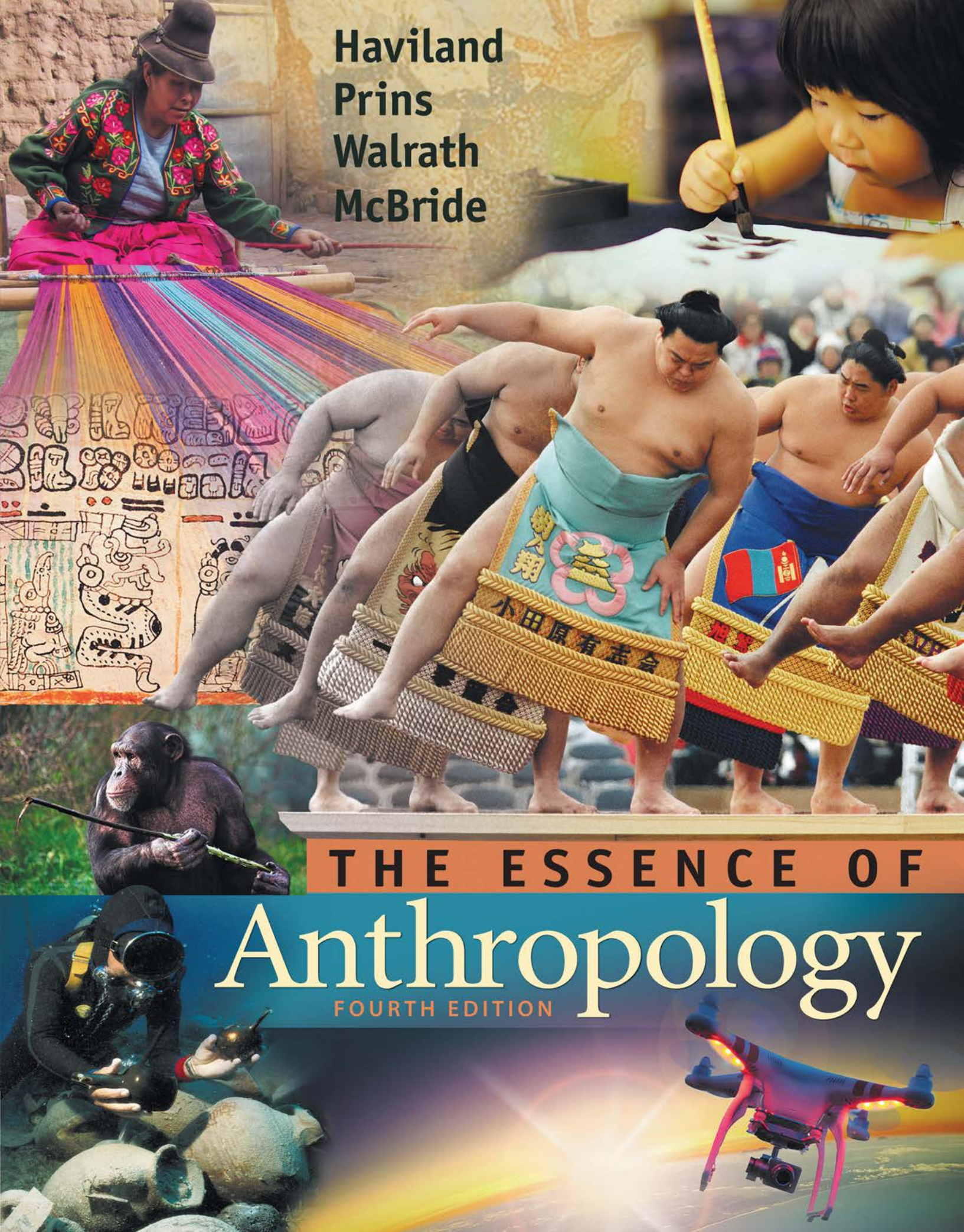
Haviland
Prins
Walrath
McBride
THE ESSENCE OF
Anthropology
FOURTH EDITION

The Essence of Anthropology

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FOURTH EDITION

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The Essence of Anthropology,
Fourth Edition

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Dedicated to our long-time editor Lin Marshall Gaylord, whose distinct love for and knowledge of anthropology and publishing has kept us on a steady and inspired course through every edition of our textbooks. With gratitude for her professional commitment to excellence, depth of editorial experience, and, importantly, her enthusiasm, freely expressed in hearty laughter.

About the Authors

Although each has a distinct voice, all four members of this author team share overlapping research interests and a similar vision of what anthropology is (and should be) about. For example, all are "true believers" in the four-field approach to anthropology, and all have some involvement in applied work.

Dr. William A. Haviland is professor emeritus at the University of Vermont, where he founded the Department of Anthropology and taught for thirty-two years. He holds a PhD in anthropology from the University of Pennsylvania.

He has carried out original research in archaeology in Guatemala and Vermont; ethnography in Maine and Vermont; and physical anthropology in Guatemala. This work has been the basis of numerous publications in various national and international books and journals, as well as in media intended for the general public. His books include *The Original Vermonters*, coauthored with Marjory Power, and a technical monograph on ancient Maya settlement. He also served as consultant for the award-winning telecourse *Faces of Culture,* and he is coeditor of the series *Tikal Reports,* published by the University of Pennsylvania Museum of Archaeology and Anthropology.

Besides his teaching and writing, Dr. Haviland has lectured to numerous professional as well as nonprofessional audiences in Canada, Mexico, Lesotho, South Africa, and Spain, as well as in the United States. A staunch supporter of indigenous rights, he served as expert witness for the Missisquoi Abenaki of Vermont in an important court case over aboriginal fishing rights.

Awards received by Dr. Haviland include being named University Scholar by the Graduate School of the University of Vermont in 1990; a Certificate of Appreciation from the Sovereign Republic of the Abenaki Nation

of Missisquoi, St. Francis/Sokoki Band in 1996; and a Lifetime Achievement Award from the Center for Research on Vermont in 2006. Now retired from teaching, he continues his research, writing, and lecturing from the coast of Maine. He serves as a trustee for the Abbe Museum in Bar Harbor, focused on Maine's Native American history, culture, art, and archaeology. His most recent books are *Canoe Indians of Down East Maine* (2012) and *Excavations in Residential Areas of Tikal: Non-Elite Groups without Shrines* (2014).

Dr. Harald E. L. Prins is a University Distinguished Professor of cultural anthropology at Kansas State University. Academically trained at half a dozen Dutch and U.S. universities, he previously taught at Radboud University (Netherlands), Bowdoin College and Colby College in Maine, and was a visiting professor at Lund University in Sweden. Also named a Distinguished University Teaching Scholar, he received numerous honors for his outstanding academic teaching, including the Presidential Award in 1999, Carnegie Professor of the Year for Kansas in 2006, and the AAA/Oxford University Press Award for Excellence in Undergraduate Teaching of Anthropology in 2010.

His fieldwork focuses on indigenous peoples in the western hemisphere, and he has long served as an advocacy anthropologist on land claims and other native rights. In that capacity, Dr. Prins has been the lead expert witness in both the U.S. Senate, U.S. District Court, and Canadian federal and provincial courts. He worked on a UNESCO project in Paris on anthropology and racism, and also chaired or served on dozens of panels, including for the Wenner-Gren Foundation and the U.S. Department of Health and Human Services. He has refereed for 40 academic book publishers and journals. His own numerous academic publications appear in nine languages, with books including *The Mi'kmaq: Resistance, Accommodation, and Cultural Survival* (Margaret Mead Award finalist).

Also trained in filmmaking, he was president of the Society for Visual Anthropology, and coproduced award-winning documentaries. He has been the visual anthropology editor of *American Anthropologist*, coprincipal investigator for the U.S. National Park Service, international observer in Paraguay's presidential elections, and a research associate at the National Museum of Natural History, Smithsonian Institution.

Dr. Dana Walrath, an award winning writer, artist, and anthropologist, is a faculty member of University of Vermont's College of Medicine. After earning her PhD in medical and biological anthropology from the University of Pennsylvania, she taught there and at Temple University. Dr. Walrath broke new ground in paleoanthropology through her work on the evolution of human childbirth. She has also written on a wide range of topics related to gender in paleoanthropology, the social production of sickness and health, sex differences, genetics, and evolutionary medicine. Her work has appeared in edited volumes and in journals such as *Current Anthropology, American Anthropologist, American Journal of Physical Anthropology*, and *Anthropology Now*. Her books include *Aliceheimer's*, a graphic memoir, and *Like Water on Stone* a verse novel. She developed a novel curriculum in medical education at the University of Vermont's College of Medicine that brings humanism, anthropological theory and practice, narrative medicine, and professionalism skills to first-year medical students.

Dr. Walrath also has an MFA in creative writing from Vermont College of Fine Arts and has exhibited her artwork in North America and Europe. Her recent work on in the field of graphic medicine combines anthropology with memoir and visual art. Spanning a variety of disciplines, her work has been supported by diverse sources such as the National Science Foundation, the Templeton Foundation, the Centers for Disease Control, the Health Resources and Services Administration, the Vermont Studio Center, the Vermont Arts Council, and the National Endowment for the Arts. She spent 2012–2013 as a Fulbright Scholar at the American University of Armenia and the Institute of Ethnography and Archaeology of the National Academy of Sciences of Armenia. She is currently working on a second graphic memoir that combines her *Aliceheimer's* work with her fieldwork on aging and memory in Armenia.

Bunny McBride is an award-winning author specializing in cultural anthropology, indigenous peoples, international tourism, and nature conservation issues. Published in dozens of national and international print media, she has reported from Africa, Europe, China, and the Indian Ocean. Holding an MA from Columbia University,

she is highly rated as a teacher, and she has taught at the Salt Institute for Documentary Field Studies and two dozen terms as visiting anthropology faculty at Principia College. Since 1996, she has been an adjunct lecturer of anthropology at Kansas State University.

Among McBride's many publication credits are the books *Women of the Dawn; Molly Spotted Elk: A Penobscot in Paris;* and *Our Lives in Our Hands: Micmac Indian Basketmakers;* as well as chapters in a dozen books and several coauthored books, including *Indians in Eden* and *National Audubon Society Field Guide to African Wildlife*. Working on a range of issues and projects with Maine Indian tribes since 1981—including the Aroostook Band of Micmacs' successful federal recognition effort—McBride received a commendation from the Maine state legislature for her research and writing on the history of native women. *Boston Globe Sunday Magazine* featured a long profile about her, and Maine Public Television made a documentary about her research and writing on Molly Spotted Elk.

In recent years, McBride has served as coprincipal investigator for a National Park Service ethnography project and curated several museum exhibits, including "Journeys West: The David & Peggy Rockefeller American Indian Art Collection" for the Abbe Museum in Bar Harbor, Maine. Her 2012 exhibit, "Indians and Rusticators," received a 2012 Leadership in History Award from the American Association for State and Local History. Currently, she serves as president of the Women's World Summit Foundation, based in Geneva, Switzerland, and is wrapping up two books (with coauthor Harald Prins): *From Indian Island to Omaha Beach: Charles Norman Shay, Penobscot Indian War Hero* and *Native Americans in Seacoast Maine: A Natural and Cultural History of Mount Desert Island.*

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Preface

In many cultures, the number four carries symbolic meaning, suggesting completion and the essence of all things. Consider the four seasons, the four directions, the four phases of the moon, and the four elements of earth, air, fire, and water. Powerful essences wrapped up in the nice square package of four. Considering this, we cannot help but think of the four fields of anthropology conveyed in *The Essence of Anthropology,* and how they work together to offer a holistic and integrative look at our species.

And, speaking of "four," this is the fourth edition of *Essence*. It is more thoroughly revised than any new edition since its debut a dozen years ago. Entering its fourth phase, the book's evolution has been fueled by our own ongoing research, along with vital feedback from students and anthropology professors who have used and reviewed previous editions. We have scrutinized the archetypal examples of our discipline and weighed them against the latest innovative research methodologies, archaeological discoveries, genetic and other biological findings, linguistic insights, and ethnographic descriptions, theoretical revelations, and significant examples of applied anthropology. We believe that these considerations, combined with giving attention to compelling issues in our global theater, have resulted in a lively and relevant textbook that presents both classical and fresh material in ways that stimulate student interest, stir critical reflection, and prompt "ah-ha" moments.

The word *essence* has served as our guiding principle—alerting us to reach for content that covers anthropology's established foundations and modern ramifications without getting distracted by too many details or examples. With each revision, one thing has remained constant: the goal of presenting four-field anthropology to undergraduates in a concise text that does justice to the breadth and depth of the discipline—a book that is light in weight, but not "lightweight." We remain committed to creating a stimulating, quick-moving narrative that gives anthropology majors a solid basis for more advanced coursework while sowing seeds of awareness in all students concerning cultural and biological diversity.

For those unfamiliar with the Haviland et al. textbook series, it is important to note that like the earlier editions of *Essence*, this one stands on the substantial shoulders of our *Anthropology: The Human Challenge*—now in its 14th edition and the discipline's leading introductory textbook for many years.

Our Mission

Most students enter an introductory anthropology class intrigued by the general subject but with little more than a vague sense of what it is all about. Thus the first and most obvious task of our text is to provide a thorough introduction to the discipline—its foundations as a domain of knowledge and its major insights into the rich diversity of humans as a culture-making species. Recognizing the wide spectrum of students enrolled in entry-level anthropology courses, we cover the fundamentals of the discipline in an engaging, illustrative fashion—creating a textbook that establishes a broad platform on which teachers can expand the exploration of concepts and topics in ways that are particularly meaningful to them and their students.

In doing this, we draw from the research and ideas of a number of traditions of anthropological thought, exposing students to a mix of theoretical perspectives and methodologies. Such inclusiveness reflects our conviction that different approaches offer distinctly important insights about human biology, behavior, and beliefs.

If most students start out with only a vague sense of what anthropology is, they often have less clearly defined but potentially more problematic views of the superiority of their own species and culture. A second task for this text, then, is to encourage students to appreciate the richness and complexity of human diversity. Along with this goal is the aim of helping them understand why there are so many differences and similarities in the human condition, past and present.

Debates regarding globalization and notions of progress, the "naturalness" of the mother, father, child(ren) nuclear family, new genetic technologies, and how gender roles relate to biological variation all benefit greatly from the distinct insights gained through anthropology's wide-ranging, holistic perspective. This aspect of the discipline is one of the most valuable gifts we can pass on to those who take our classes. If we, as teachers (and textbook authors), do our jobs well, students will gain a wider and more open-minded outlook on the world and a critical but constructive perspective on human origins and on their own biology and culture today. To borrow a favorite line from the famous poet T. S. Eliot, "the end of all our exploring will be to arrive

where we started and know the place for the first time" ("Little Gidding," *Four Quartets*).

We have written this text, in large part, to help students make sense of our increasingly complex world and to navigate through its interrelated biological and cultural networks with knowledge and skill, whatever professional path they take. We see the book as a guide for people entering the often bewildering maze of global crossroads in the 21st century.

A Distinctive Approach

Two key factors distinguish *The Essence of Anthropology* from other introductory anthropology texts: our integrative presentation of the discipline's four fields and a trio of unifying themes that tie the book together.

Integration of the Four Fields

Unlike traditional texts that present anthropology's four fields—biological anthropology, archaeology, linguistics, and cultural or social anthropology—as if they were separate or independent, our book takes an integrative approach. This reflects the holistic character of our discipline, a domain of knowledge where members of our species are studied in their totality—as social creatures biologically evolved with the inherent capacity for learning and sharing culture by means of symbolic communication. This approach also reflects our collective experience as practicing anthropologists who recognize that we cannot fully understand humanity in all its fascinating complexity unless we see the systemic interplay among environmental, physiological, material, social, ideological, psychological, and symbolic factors, both past and present.

For analytical purposes, however, we discuss physical anthropology as distinct from archaeology, linguistics, and sociocultural anthropology. Accordingly, there are separate chapters that focus primarily on each field, but the links among them are shown repeatedly. Among many examples of this integrative approach, Chapter 7, "Modern Human Diversity—Race and Racism," discusses the social context of race and recent cultural practices that have impacted the human genome. Similarly, material concerning linguistics appears not only in Chapter 9, "Language and Communication," but also in Chapter 3, "Living Primates," Chapter 4, "Human Evolution," and Chapter 6, "The Emergence of Cities and States." These chapters include material on the linguistic capabilities of apes, the emergence of human language, and the origin of writing. In addition, every chapter includes a Biocultural Connection feature to further illustrate the interplay of biological and cultural processes in shaping the human experience.

Unifying Themes

In our own teaching, we recognize the value of marking out unifying themes that help students see the big picture as they grapple with the vast array of material involved with the study of human beings. In *Essence,* we employ three such themes:

1. **Systemic adaptation:** We emphasize that every culture, past and present, is an integrated and dynamic system of adaptation that responds to a combination of internal and external factors, including influences of the environment.
2. **Biocultural connection:** We highlight the integration of human culture and biology in the steps humans take to meet the challenges of survival. The biocultural connection theme is interwoven throughout the text—as a thread in the main narrative and in boxed features that highlight this connection with a topical example for each chapter.
3. **Globalization:** We track the emergence of globalization and its disparate impact on various peoples and cultures around the world. European colonization was a global force for centuries, leaving a significant and often devastating footprint on the affected peoples in Asia, Africa, and the Americas. Decolonization began about 200 years ago and became a worldwide wave in the mid-1900s. However, since the 1960s, political and economic hegemony has taken a new and fast-paced form—namely, globalization (in many ways a concept that expands or builds on imperialism). Attention to both forms of global domination—colonialism and globalization—runs through *Essence,* culminating in the final chapter where we apply the concept of structural power to globalization, discussing it in terms of hard and soft power and linking it to structural violence.

Pedagogy

The Essence of Anthropology features a range of learning aids, in addition to the three unifying themes previously described. Each pedagogical piece plays an important role in the learning process—from clarifying and enlivening the material to revealing relevancy and aiding recall.

Accessible Language and a Cross-Cultural Voice

In writing this text, we consciously cut through unnecessary jargon to speak directly to students. Manuscript reviewers have recognized this, noting that even the most difficult concepts are presented in prose that is straightforward and understandable for today's first- and second-year college students. Where technical terms are necessary, they appear in bold type with a clear definition in the narrative. The definition appears again in the running glossary at the bottom of our pages, and again in a summary glossary at the end of the book.

To make the narrative more accessible to students, we deliver it in chewable bites—short paragraphs. Numerous subheads provide visual cues to help students track what has been read and what is coming next.

Accessibility involves not only clear writing enhanced by visual cues, but also an engaging voice or style. The voice of *Essence* is distinct among introductory texts in the discipline, for it has been written from a cross-cultural perspective. We avoid the typical Western "we/they" voice in favor of a more inclusive one that will resonate with both Western and non-Western students and professors. Also, we highlight the theories and work of anthropologists from all over the world. Finally, we have drawn the text's cultural examples from industrial and postindustrial societies as well as nonindustrial ones.

Compelling Visuals

Haviland et al. texts repeatedly garner praise from students and faculty for having a rich array of visuals, including maps, photographs, and figures. This is important because humans—like all primates—are visually oriented, and a well-chosen image may serve to "fix" key information in a student's mind. Unlike some competing texts, all of our visuals are in color, enhancing their appeal and impact. This edition of *Essence* features about ten photographs per chapter, many presented in large format to increase their impact. These are in addition to maps and figures created with a colorblind-sensitive palette.

Photographs

Our pages feature a hard-sought collection of compelling, content-rich photographs. Large in size, many of them come with substantial captions composed to help students do a "deep read" of the image. Each chapter includes about ten pictures. New to this edition are "Visual Counterpoints"—side-by-side photos that effectively compare and contrast biological or cultural features.

Visual Essence

Each chapter begins with the Visual Essence feature—an especially compelling photograph accompanied by a paragraph that prompts students to study the image and think about the essence of that particular chapter.

Maps

Geographic aids appear throughout the book, beginning with an introductory world map that identifies the many ethnic groups profiled in the text. Chapters feature locator maps, as well as distribution maps that provide overviews of key issues such as pollution, energy consumption, migration, and religion.

Student Learning Objectives, Knowledge Skills, and Chapter Checklist

Each chapter narrative opens with a set of learning objectives. Presented under the heading "In this chapter you will learn to," this feature gives students a tangible grip on the main goals of the chapter and the knowledge skills they are expected to develop while reading and studying the material. These goals are incorporated in a closing Chapter Checklist, which summarizes the chapter's content in an easy-to-follow format.

Thought-Provoking Questions

The Biocultural Connection essay featured in every chapter ends with a thought-provoking question aimed toward helping students grapple with and firmly grasp that connection. In addition, the end pages of each chapter offer four Questions for Reflection designed to stimulate and deepen thought, trigger class discussion, and link the material to the students' own life.

Integrated Methods: Digging into Anthropology

New to this edition is our "Digging into Anthropology" feature, presented at the end of every chapter, just after the Questions for Reflection. These hands-on assignments offer students an opportunity to dig deeper into each chapter's content through mini "fieldwork" projects designed to integrate methodology throughout the book and prod students in exploring topics in their own culture.

Integrated Theory: Barrel Model of Culture

Past and present, every culture is an integrated and dynamic system of adaptation that responds to a combination of internal and external factors. This is illustrated by a pedagogical device we refer to as the "barrel model" of culture. Depicted in a simple but telling drawing (Figure 8.5), the barrel model shows the interrelatedness of

social, ideological, and economic factors within a cultural system along with outside influences of environment, climate, and other societies. Throughout the book, examples are linked to this point and this image.

Integrated Gender Coverage

In contrast to many introductory texts, *The Essence of Anthropology* integrates coverage of gender throughout the book. Thus material on gender-related issues is included in *every* chapter. As a result of this approach, gender-related material in *Essence* far exceeds the single chapter that most books devote to the subject.

We have chosen to integrate this material because concepts and issues surrounding gender are almost always too complicated to remove from their context. Spreading this material through all of the chapters has a pedagogical purpose, for it emphasizes how considerations of gender enter into virtually everything people do. Gender-related material ranges from discussions of gender roles in evolutionary discourse and studies of nonhuman primates, to intersexuality, homosexual identity, and same-sex marriage. Through a steady drumbeat of such coverage, this book avoids ghettoizing gender to a single chapter that is preceded and followed by resounding silence.

Glossary as You Go

The running glossary is designed to catch the students' eye, reinforcing the meaning of each newly introduced term. It is also useful for chapter review, as students may readily isolate the new terms from those introduced in earlier chapters. A complete glossary is also included at the back of the book. In the glossaries, each term is defined in clear, understandable language. As a result, less class time is required for going over terms, leaving instructors free to pursue other matters of interest.

Special Boxed Features

Essence includes three types of special boxed features. Every chapter contains a Biocultural Connection, along with either an Original Study or an Anthropology Applied profile. These features are carefully placed and introduced within the main narrative to alert students to their importance and relevance.

Biocultural Connections

Appearing in every chapter, this signature feature of the Haviland et al. textbooks illustrates how cultural and biological processes interact to shape human biology, beliefs, and behavior. It reflects the integrated biocultural approach central to the field of anthropology today. All of the Biocultural Connections include a critical thinking question. For a quick peek at titles, see the "Features Contents" inventory just after the Table of Contents.

Original Studies

Written expressly for this text or adapted from ethnographies and other original works by anthropologists, these studies present concrete examples that bring specific concepts to life and convey the passion of the authors. Each study sheds additional light on an important anthropological concept or subject area found in the chapter where it appears. Notably, each Original Study is integrated within the flow of the chapter narrative, signaling students that the content is not extraneous or supplemental. Appearing in nine chapters, Original Studies cover a wide range of topics, evident from their titles, listed in the "Features Contents" inventory just after the Table of Contents.

Anthropology Applied

Featured in eight chapters, these succinct and compelling profiles illustrate anthropology's wide-ranging relevance in today's world. They give students a glimpse into the range of careers anthropologists enjoy—from forensics to language preservation. For a quick peek at topics covered, see the "Features Contents" inventory just after the Table of Contents.

Changes and Highlights in the Fourth Edition

The pedagogical features described previously strengthen each of the sixteen chapters in *The Essence of Anthropology,* serving as threads that tie the text together and help students feel the holistic nature of the discipline. In addition, the engagingly presented concepts themselves provide students with a solid foundation in the principles and practices of anthropology today.

The book in hand is distinct from the first three editions. Throughout, data and examples have been updated, less relevant material has been trimmed or cut, new examples and findings have been woven into the story, and the writing has been further chiseled to make it all the more clear and engaging. Each chapter opens with a new Visual Essence photograph and caption. We've increased the number of photos and replaced numerous images that appeared in earlier editions, so many new compelling pictures will be found from start to finish.

The student learning objectives (SLOs) introduced as a new chapter opening feature in the third edition have been honed and more clearly tied to the Chapter Checklists at the end of every chapter. (Both are described in the previous pedagogy inventory.) Presented under the heading As described in the pedagogy inventory just presented, the SLOs give students a tangible grip on the critical

goals of the chapter and the knowledge skills they are expected to develop while reading and studying the material. Other changes with this edition include new Questions for Reflection in many of the chapters and a new discussion question in every chapter's Biocultural Connection feature. Brand new to this edition is the inclusion of a "Digging into Anthropology" assignment at the end of each chapter. Designed to bring subject matter to life, this feature also provides tangible ways for professors to introduce anthropological methods.

Beyond these changes, each chapter has undergone specific modifications and additions. The inventory that follows provides brief previews of the chapter contents and changes in this edition.

Chapter 1: Thinking and Doing Anthropology

This introductory chapter emphasizes the contemporary relevance of the discipline of anthropology. It opens with a new essence feature on coltan mining, war, and global cell phone use that shows the interconnectedness of our world. Students will come to understand anthropology in relation to other disciplines as a living laboratory that allows for testing of hypotheses without the influence of culture-bound notions. Students will see how anthropological methods constantly incorporate new technologies as they develop as shown through the ethnographic exploration of cyberspace and the use of GIS technology in the field. New terms such as *ecofacts* and *features* refine the introduction to archaeology. An updated and streamlined approach to anthropological ethics makes it more relevant to students. The reorganization of the introduction to linguistic anthropology parallels the book's later chapter on linguistics, thus solidifying student learning.

The new Digging into Anthropology feature, "Talking Trash: Hidden in the Middens," on archaeology and trash provides students the opportunity to learn archaeological concepts and methods through hands-on experience. It is enhanced by updates on William Rathje's Garbage Project that focus on the trash production and deposition in large urban areas.

Chapter 2: Biology, Genetics, and Evolution

This chapter on biology, evolution, and genetics opens with a visual essence feature exploring the relationship between DNA and identity. To help students stay abreast of the technological developments in genetics and its application in the world, more details of DNA replication to protein synthesis are explained with a variety of new figures and clarified organizational headings. This will help students comprehend how scientists use genetics to trace the spread of infectious diseases like Ebola or to identify criminals or to exonerate others. Likewise, the social consequences of genetic technology are explored in the contexts of sex-selective abortion, prenatal testing for various genetic conditions, and surrogacy.

A new Biocultural Connection on genetics and immigration illustrates that simple genetic relationships do not account for the complete global variation in family structure. Compelling photographs with content-rich captions illustrate basic concepts such as toxic mutagenic agents. This very contemporary content is complemented by refined historical references regarding the history of human classification and the development of evolutionary theory. Material added on Lamarck and the inheritance of acquired characteristics lays the groundwork for students to grasp cutting-edge work in epigenetics. The new Digging into Anthropology feature, "Making Meaning of Memes," asks students to apply principles of genetics, heredity, and evolution to social media as they trace the appearance, dissemination, and mutation of memes.

Chapter 3: Living Primates

This photo-rich chapter on the living primates introduces students to our closest relatives in the animal world and to the cutting-edge discoveries about their behavior and biology. Accordingly, the discussion is expanded to include more about the other apes, gorillas, orangutans, and gibbons, instead of limiting the discussion to chimps and bonobos.

A new Original Study on arrested development among male orangutans illustrates the range of reproductive strategies and the complex interplay between behavior and biology, as does the discussion of sexual dimorphism. New figures on brachiation, vertical clinging and leaping, and primate social organization also show the variation present among the contemporary primates. The brave and creative methods of primatologists are explored in the Digging into Anthropology feature, "Finding or Losing Your Inner Ape." Here, students experience their daily lives with some primate quality either enhanced or restricted as a way to tease apart human and nonhuman primate behavior and biology.

Chapter 4: Human Evolution

Bookended by features on paleoart, this comprehensive human evolution chapter provides students with a basic paleoanthropological tool kit while exploring fundamental questions about how scientists go about reconstructing the lives of our ancestors.

The opening visual essence feature with paleoartist Élisabeth Daynès shows how she sculpts muscle, skin, and hair onto the bones of ancient fossils. The knowledge gained through the chapter's rich visual program and clear comprehensive text equips students to make a hands-on connection with paeloart in the new Digging into Anthropology feature, "Ancient Visions: Paleoart Then and Now." The chapter also includes cutting-edge paleogenetic research with the newly identified Denisovans and Neandertals and how genetics has shifted paleoanthropologcial discourse on modern human origins.

Chapter 5: The Neolithic Revolution: The Domestication of Plants and Animals

A suite of new features demonstrates the relevance of this comprehensive chapter on the Neolithic revolution to contemporary life. The competition for resources begun in the Neolithic is connected to the impact of global food markets on local economies.

A new Biocultural Connection—"Dogs Get Right to the Point" featuring the work of evolutionary anthropologist Brian Hare on the domestication of dogs—challenges human-centered models of domestication. The new Anthropology Applied feature, "Pre-Columbian Fish Farming in the Amazon" by Clark Erickson, challenges students to rethink myths about the Americas and the environment while also providing models of land use valuable for today's expanding global population. The expanded section on biological consequences of the Neolithic explores a series of Paleolithic prescriptions for today's diseases. Students are challenged to put Paleolithic prescriptions into practice in the new Digging into Anthropology methods feature.

Chapter 6: The Emergence of Cities and States

With most of the world's 7 billion plus inhabitants living in urban environments, this chapter on the emergence of cities and states demonstrates the vital role of archaeology to solving problems brought about by this dominant form of social organization.

The chapter's new Visual Essence feature explores the relationship between centralized authority and war using the destruction of archaeological treasures during the current civil war in Syria as an example. The section on the interdependence of cities has been updated to include Hurricane Katrina, Hurricane Sandy, and the 2011 earthquake and tsunami in Japan, the current war in Syria, the Ebola virus, as well as the role of social media and interconnections through cyberspace and air space. A new visually rich Original Study, "Ani: Identities and Conflicts in and around a 'Silk Road' City" by Gregory Areshian, connects global politics past and present to the discipline of archaeology. Rich with maps, figures, and explorations of archaeological methods employed at a variety of sites, this chapter also engages deeply with social stratification, an outcome of cities and states that has profound impact on human populations today through visuals and hands-on activities. Students see elaborate cemeteries turned into housing as the population of Cairo, Egypt, expands. "Mapping Class," the new Digging into Anthropology feature, asks students to bring an awareness of social stratification to their local communities as they create maps that note differences in features such as building density and materials, transportation, and access to services according to class.

Chapter 7: Modern Human Diversity: Race and Racism

This chapter's exploration of human biological diversity lets students simultaneously see that biologically speaking distinct human races do not exist and that the social division of humans into distinct races is all too real. Significantly updated to make stronger links to contemporary life—both in terms of biological breakthroughs in epigenetics and social realities such as structural violence and genocide—the chapter opens with a Visual Essence feature on basketball star Jeremy Lin.

A new Biocultural Connection, "Beauty, Bigotry, and the Epicanthic Eye Fold of the Beholder," brings students into the world of ethnic plastic surgery that individuals seek to meet a dominant "white" standard. In addition, this chapter explores the history of race-based intelligence testing and then asks students about "Digging for Bias in Standardized Tests" in their own college entrance exams. Gene environment interactions shape human biological variation but also result in unequal distribution of health globally due to the conflation of race and class, as the poor are more exposed to toxins and other stressors. Genocide is explored through Stanton's eight stages so that students have a tool kit with which to address the dangers and presence of categorizing humans into distinct groups in today's world.

Chapter 8: The Characteristics of Culture

This chapter addresses anthropology's core concept of *culture,* exploring the term and its significance for individuals and societies. It opens with a new Visual Essence photo and caption highlighting Kuchi nomads in Afghanistan, easily recognized by their distinctive dress and packed camels.

The narrative begins with a section on culture and adaptation, setting the foundation for a discussion of culture and its characteristics. Our original "barrel model" illustration appears in this chapter, showing the integrative and dynamic nature of culture and introducing the key concepts of the integration of cultural infrastructure, social structure, and superstructure. We present the Kapauku Papua of Western New Guinea as an example of culture as an integrated system, enlivening the description with a dynamic new photo of a Kapauku village. Subcultures are explored through a look at the Amish of North America, enhanced by a new photo of a community barn raising.

In addition, the chapter includes discussions on culture, society, and the individual; ethnocentrism and cultural relativism; and cultural change in the age of globalization. Special features include a new Biocultural Connection, "Modifying the Human Body," and the Anthropology Applied feature, "New Houses for Apache Indians" by George Esber, who describes his role in designing culturally appropriate homes for a Native American community.

The new Digging into Anthropology task, "Hometown Map," invites students to utilize the barrel model in

an assignment that involves mapping their community's various features.

Chapter 9: Language and Communication

This chapter begins with a dynamic new Visual Essence photograph of a busy Chinatown street in Thailand's capital city of Bangkok, where signs appear in multiple languages. It goes on to investigate the nature of language and the three branches of linguistic anthropology—descriptive linguistics, historical linguistics, and the study of language in its social and cultural settings (ethnolinguistics and sociolinguistics). Also found here are sections on paralanguage and tonal languages, and a unique introductory exploration of talking drums and whistled speech. We have retooled the section on language and gender, and we have revised and retitled the body language section to "Nonverbal Communication" to make it a more fitting head for discussions on proxemics and kinesics.

Our discussion of language loss and revival includes a look at modern technology used by linguistic anthropologists collaborating on field research with speakers of endangered Khoisan "click" languages in southern Africa. That section also includes the latest data on the digital divide and its impact on ethnic minority languages—plus an updated chart showing Internet language populations. A historical sketch about writing takes readers from traditional speech performatives and memory devices to Egyptian hieroglyphics to the conception and spread of the alphabet. A concluding section on literacy and modern telecommunication looks at issues of language in our globalized world.

A new Visual Counterpoint contrasts social space across cultures. Boxed features include S. Neyooxet Greymorning's Anthropology Applied essay on language revitalization, and a revised Biocultural Connection on the biology of human speech. The new Digging into Anthropology task, "Body Talk," calls on students to investigate the relationship between language and culture by documenting the body language of individuals from different cultures and also by observing and noting what happens when students alter their own body language.

Chapter 10: Social Identity, Personality, and Gender

Looking at individual identity within a sociocultural context, this chapter surveys the concept of self, enculturation and the behavioral environment, social identity through personal naming, the development of personality, the concepts of group and modal personality, and the idea of national character. It opens with a fascinating Visual Essence image of Khanty mothers and their fur-clad children on a reindeer sled at their winter camp in Siberia.

This ethnographically rich chapter features a revised investigation of naming practices including new material on matronyms and teknonyms—the latter illustrated by a striking new photo of a Tuareg naming ceremony. The section on self and the behavior environment presents a new pair of Visual Counterpoint photos contrasting an Inuit hunter in a sea kayak with an individual navigating cyberspace while waiting to board a plane. Our discussion of child-rearing practices includes a striking new photograph that brings enlivens the discussion on interdependence training among the Beng of West Africa. And the section on group personality offers narrative and visual descriptions of the Yanomami's masculine ideal of *waiteri.* Our exploration of alternative gender models includes R. K. Williamson's highly personal Original Study about intersexuality, along with several fresh examples: the social recognition of five genders among the Bugis of Indonesia, transgendered Hijras in India, and an updated picture of intersexed Olympian track star Caster Semenya from South Africa.

A new section titled "The Social Context of Sexual and Gender Identity" provides recent global statistics on state-sponsored homophobia. On its heels is a broad-ranging section titled "Normal and Abnormal Personality in Social Context," which presents the extreme sadhu tradition in India and then discusses mental disorders across time and cultures. The Biocultural Connection offers a cross-cultural view on psychosomatic symptoms and mental health, while a concluding section, "Personal Identity and Mental Health in Globalizing Society," drives home the need for medical pluralism with a variety of modalities fit for humanity in the worldwide dynamics of the 21st century. This chapter's Digging into Anthropology assignment, "Gender across Generations," charges students to do intergenerational interviewing on the concepts of femininity and masculinity to gain insight on gender differentiation.

Chapter 11: Subsistence and Exchange

Here we investigate the various ways humans meet their basic needs and how societies adapt through culture to the environment, beginning with a dramatic new Visual Essence photo of peasant farmers practicing wet-rice cultivation on the steep slopes of China's Guangxi Province. This connects to the subject matter of economic systems—the production, distribution, and consumption of goods—also covered in the chapter. The narrative begins with a discussion of adaptation, followed by profiles on modes of subsistence in which we look at food-foraging and food-producing societies—pastoralism, crop cultivation, and industrialization.

Numerous new photos enliven this chapter. The chapter headings, along with the narratives they introduce, have been revised to provide greater clarity and a consistent focus on how—across time, space, and cultures—food is obtained, produced, and distributed.

The section on adaptation and cultural evolution features a new, beautifully illustrated subsection recounting the latest ethnohistorical research on ecosystemic

collapse on Rapa Nui, commonly known as Easter Island. A discussion of peasantry leads into an illustrated narrative about large-scale industrial food production, using chickens as an example.

Under the heading "Subsistence and Economics," we delve into the control of resources (natural, technological, labor) and types of labor division (gender, age, cooperative, craft specialization). A section on distribution and exchange defines various forms of reciprocity, along with redistribution (including a potlatch account) and market exchange. The discussion on leveling mechanisms looks at the potlatch and features an ethnographically rich photo of a contemporary Tlingit potlatch in Sitka, Alaska.

Our trimmed concluding section on local economies and global capitalism includes a discussion on the development and marketing of genetically modified seeds, indicating the economic possibilities and risks of our era. Also new is a section on the informal economy.

Boxed features in this chapter include a new Anthropology Applied piece on global ecotourism in Bolivia and a newly illustrated Biocultural Connection on chocolate.

"Global Dining," the topic of this chapter's Digging into Anthropology task, gives students an opportunity to see how they "embody" globalization by having them make a list of their groceries and locate the source of each item on a map.

Chapter 12: Sex, Marriage, and Family

Exploring the inseparable connections among sexual reproductive practices, marriage, family, and household, this chapter opens with a gorgeous new photo of a Muslim bride and her female relatives and friends displaying hands decorated with traditional henna designs. Particulars addressed in this chapter include the incest taboo, endogamy and exogamy, dowry and bridewealth, cousin marriage, same-sex marriage, divorce, residence patterns, and nonfamily households. Up-to-date definitions of *marriage, family, nuclear family,* and *extended family* encompass current real-life situations around the world.

The chapter's opening paragraphs on marriage and the regulation of sexual relations present a recent example of Sharia law as it relates to women and adultery, along with a nuanced commentary about the relationship between such restrictive rules and the incidence of HIV/AIDS. A discussion on polygamy in the "Forms of Marriage" section includes a look at the impact immigration is having on polygamy statistics in Europe and the United States, even as the practice declines in sub-Saharan Africa.

The chapter's closing section sketches the impact of global capitalism, electronic communication, and transnationalism on love relations. It includes subsections on adoption, new reproductive technologies, and migrant workforces. Two popular boxed features remain in this chapter: Serena Nanda's Original Study, "Arranging Marriage in India," and Martin Ottenheimer's Biocultural Connection on marriage prohibitions in the United States.

This chapter's Digging into Anthropology is titled "Sex Rules?" It involves making a list of six distinctive sets of sexual relationships, noting which are socially accepted or prohibited by law or faith and what the punishment is for breaking the prohibition. The second half of the exercise is comparison and analysis.

Chapter 13: Kinship and Other Forms of Grouping

Beginning with a festive Visual Essence photograph showing the opening parade of a clan gathering in Scotland, this chapter marks out the various forms of descent groups and the role descent plays as an integrated feature in a culture system. The discussion includes details and examples of lineages, clans, phratries, and moieties, followed by illustrated examples of a representative range of kinship systems and their kinship terminologies.

A substantial section on grouping beyond kinship includes discussions of grouping by gender, age, and common interest. The latter includes a lively new Visual Counterpoint contrasting two men's groups: Shriners (committed to fun, fellowship, and service) and Yakuza (tattooed members of Japan's crime syndicate). Also featured is the massive, far-reaching Self-Employed Women's Association in India.

A section titled "Associations in the Digital Age" describes rapid and widespread changes in social networking platforms across the globe, noting their impact on personal, professional, and political relationships—including challenging social hierarchies among civil rights activists. This brings us to a section about grouping based on social hierarchy, presenting three historical case studies: one on caste and its role in India's Hindu culture and two concerning racial segregation in South Africa and the United States. The section on social mobility features a revised discussion of the civil rights movement among India's Untouchables and the lowest Sudra castes (collectively called Dalits), in particular a brief profile and dramatic photograph of a group of women activists known as the "pink vigilantes."

Several new photographs appear in this chapter, and special features include the newly illustrated Biocultural Connection, "Maori Origins: Ancestral Genes and Mythical Canoes," and archaeologist Michael Blakey's Original Study on the African Burial Ground Project.

"Comfortable Connecting?" is the title of this chapter's Digging into Anthropology. It tasks students with investigating how their social media self (or that of an interviewee) may be different from their face-to-face self.

Chapter 14: Politics, Power, and Violence

Looking at a range of uncentralized and centralized political systems—from kin-ordered bands and tribes to

chiefdoms and states—this heavily revised chapter explores the question of power, the intersection of politics and religion, and issues of political leadership and gender. It opens with a dramatic new Visual Essence photo of the Nigerian emir of Kano in a military parade during a festival ending the Muslim holy month of Ramadan.

The sections on bands, tribes, chiefdoms, and states have all been significantly revised—reorganized, tightened, and illustrated with adjusted or new ethnographic examples. For example, the Pashtun are now featured in the section on tribes, and the Kpelle chiefdom narrative carries readers from precolonial to contemporary times. The section on state offers a revised definition of the term and updated examples. We also improved significantly our discussions and examples of political systems and authority, politics and religion, and politics and gender—the latter including updates on the example of the dual-sex government among the Igbo of Nigeria.

A new section titled "Cultural Controls and the Maintenance of Order" streamlines our discussion of cultural control and its two forms (internalized/self-control and externalized control, including sanctions), each illustrated with ethnographic examples. In another new section, "Holding Trials, Settling Disputes, and Punishing Crimes," we contrast traditional kin-based approaches to those of politically centralized societies, ending with a discussion of restorative justice.

New in our discussion of violent conflict and warfare is a section on the evolution of warfare, which sketches its development in chiefdoms and states, up through World War II, the Chinese civil war, and modern inventions in military technology. It features a new photo and substantive caption about drones. Looking at domination and repression, we discuss acculturation, ethnocide, and genocide, along with violent and nonviolent forms of resistance, including revitalization movements and diplomacy. A final section discusses the politics of nonviolence with two vivid examples—brief profiles of movements led by Gandhi in India and Aung San Suu Kyi in Myanmar.

Special features in this chapter include a Biocultural Connection, "Gender, Sex, and Human Violence," and an Anthropology Applied box about the work of William Ury on dispute resolution.

"Politics and Purses," the Digging into Anthropology assignment for this chapter, takes students on a journey to locate links between money and power.

Chapter 15: Spirituality and Religion

This entirely revised chapter, rich with new visuals, opens with a poignant Visual Essence photo showing a crowded pilgrimage to the shrine of the Virgin of Guadalupe, patron saint of Mexico.

The main narrative begins with a discussion of superstructure and worldview. Noting the distinction between spirituality and religion, we discuss the roles they play and the anthropological approach to studying them, and offer a chart and a map that mark out the numbers of religious adherents and the concentrations of major religions around the world. We introduce myths and their role in mapping cosmology. Then we move on to discuss supernatural beings and spiritual forces—from gods and goddesses to ancestral spirits and the concepts of animism and animatism.

Next we mark out religious specialists. Our overview of priests and priestesses includes Hillary Crane's fascinating Biocultural Connection on the masculinization of Taiwanese nuns. And the discussion of shamans features our "shamanic complex" diagram and Marjorie Shostak's Original Study, "Healing among the Ju/'hoansi of the Kalahari."

In a section on ritual performances, we discuss taboos and cleansing ceremonies (noting the use of water, air, fire, and earth), rites of passage (describing, with ethnographic examples, the phases of separation, transition, and incorporation), rites of intensification, magic (imitative and contagious), divination (from geomancy to chiromancy, and necromancy). A section on witchcraft offers a brief cross-cultural overview, followed by a more detailed description of Navajo skinwalkers. Next we explore sacred sites—from shrines to mountains—and the pilgrimages (devotions in motion) they inspire. This includes a subsection on female saints, highlighting Marian devotions and Black Madonnas in particular. It also includes a discussion of desecration, past and present.

Moving on to a section on cultural dynamics, we explore religious and spiritual change, including revitalization movements and syncretic religions, focusing on Vodou in Haiti. Next we move on to religious pluralism and secularization, providing an overview of spirituality and religious practices today. The chapter concludes by noting that the anthropological study of religion is crucial to gaining an understanding of today's world.

This chapter's Digging into Anthropology is titled "Going through a Phase." It calls on students to observe a rite of passage, take note of its phases, and analyze why the event requires a ritual.

Chapter 16: Global Changes and the Role of Anthropology

This final chapter—enhanced with numerous new photos, along with global maps depicting pollution, migrations, and energy consumption—zeroes in on numerous global challenges confronting the human species today. It prompts students to use anthropological tools to think critically about these issues and to help bring about a future in which humans live in harmony with one another and with the nature that sustains us all.

Following a Visual Essence featuring a new photograph of an Internet bar in China, we begin the main narrative with an overview of the processes of modernization. Then, in a new section titled "Cultural Revolutions: From

Terra Incognita to Google Earth," we offer a succinct historical tracing of human movement and interaction across the globe from 500 years ago through today's era of globalization. Next we explore the forces of global integration and fragmentation, taking a look at Westernization and its counterforce of growing nationalism and the breakup of multiethnic states. We present examples of resistance to globalization and discuss transnationals, diasporic communities, xenophobia, pluralism, and multiculturalism. Developing the discussion of migration and pluralism, we present a new section, "Migrants, Urbanization, and Slums," offering a brief historical overview of the growth of cities worldwide and the fact that about 1 billion people in the world live in slums.

Recounting the ever-widening gap between those who have wealth and power and those who do not, we define and illustrate the term *structural power* and its two branches—hard power (military and economic might) and soft power (media might that gains control through ideological influence). The section on hard power includes a new figure showing the global distribution of military expenditure, as well as a detailed discussion of the rise of global corporations, accompanied by a revised graph comparing corporate revenues to country GDPs.

We next look at problems of structural violence, from pollution and global warming to epidemics of hunger and obesity. The issue of pollution is tangibly conveyed in this chapter's Biocultural Connection, "Toxic Breast Milk," which chronicles how animals eaten by Arctic peoples have been contaminated by chemicals carried thousands of miles by winds, rivers, and ocean currents. Structural violence evidence in obesity and hunger is vividly represented in a new Visual Counterpoint that juxtaposes images of both as two faces of malnutrition. Also discussed are the roles structural power and violence play in internal and external migrations, touching on the lives of refugees, migrant workers, and diasporic communities.

A revised concluding section offers a positive note about anthropology's potential for helping to resolve some of the negative aspects of globalization covered in the chapter. It features a new, heartening Anthropology Applied essay about the work of world-renowned medical doctor, anthropologist, and human rights activist Paul Farmer.

"How are You Wired?" asks this chapter's Digging into Anthropology question. It directs students to track/compare/analyze how telecom devices are used within their intergenerational circle.

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The Essence of Anthropology

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VISUAL ESSENCE

How do we make sense of the world and our place in the universe? Who am I, and how am I connected to the person pictured here? Why might we look different or the same? And why are there so many different languages? Who sewed my shirt's seams or planted wheat for my bread? Why are some people immune to a virus that kills others? When did our ancestors first begin to think? What distinguishes us from other animals? Anthropologists approach such questions holistically, framing them in a broad integrated context that considers human culture and biology, in all times and places, as inextricably intertwined. This photograph shows the hands of a miner holding coltan, a tarlike mineral mined in eastern Congo. As the key component of capacitors in small electronic devices, coltan is highly valued on the global market. Coltan mines, enriching the warring Congolese factions that control them, are hellholes for thousands of people, including children, who work the mines. Bought, transported, and processed by foreign merchants and corporations, small bits of this mineral eventually end up in mobile phones and laptop computers worldwide. Although the link between you and globalization is complex, no more than "six degrees of separation" exist between your hands and these in the heart of Africa. Anthropology's holistic and integrative perspective will equip you to explore and negotiate today's interconnected and globalized world.

Thinking and Doing Anthropology

1

The Anthropological Perspective

Anthropology is the study of humankind in all times and places. Of course, many other disciplines focus on humans in one way or another. For example, anatomy and physiology concentrate on our species as biological organisms. Anthropology focuses on the interconnections and interdependence of *all* aspects of the human experience in all places, in the present and deep into the past, well before written history. This unique, broad **holistic perspective** equips anthropologists to address that elusive thing we call *human nature*.

Anthropologists welcome the contributions of researchers from other disciplines, and in return offer their own findings to these other disciplines. Anthropologists might not know as much about the structure of the human eye as anatomists or as much about the perception of color as psychologists. As synthesizers, however, anthropologists seek to understand how anatomy and psychology relate to color-naming practices in different societies. Because they look for the broad basis of ideas and practices without limiting themselves to any single social or biological aspect, anthropologists can acquire an especially expansive and inclusive overview of human biology and culture.

Keeping a holistic perspective allows anthropologists to prevent their own cultural ideas and values from distorting their research. As the old saying goes, people often see what they believe, rather than what appears before their eyes. By maintaining a critical awareness of their own assumptions about human nature—checking and rechecking how their beliefs and actions might shape their research—anthropologists strive to gain objective knowledge about humans. With this in mind, anthropologists aim to avoid the pitfalls of **ethnocentrism**, a belief that the ways of one's own culture are the only proper ones. Thus anthropologists have expanded our understanding of diversity in human thought, biology, and behavior, as well as our understanding of the many things humans have in common (➤ **Figure 1.1**).

Anthropologists come from many different backgrounds, and individuals practicing the discipline vary in their personal, national, ethnic, political, and religious beliefs. At the same time, they apply a rigorous methodology for researching cultural practices from the perspective of the culture being studied—a methodology that requires them to check for the influences of their own biases. This is as true for an anthropologist analyzing the culture of the global banking industry as for one investigating contemporary hunter-gatherers. We might say that anthropology is a discipline concerned with unbiased evaluation of diverse human systems, including one's own. At times this requires challenging the status quo that power elites of the system under study maintain and defend.

In this chapter you will learn to:

- ➔ **Describe the discipline of anthropology, and make connections between each of its four fields.**
- ➔ **Compare anthropology to the sciences and the humanities.**
- ➔ **Identify the characteristics of anthropological methods.**
- ➔ **Define the ethical principles that guide anthropological research.**
- ➔ **Explain the usefulness of anthropology in light of globalization.**

anthropology The study of humankind in all times and places.

holistic perspective A fundamental principle of anthropology, that the various parts of human culture and biology must be viewed in the broadest possible context in order to understand their interconnections and interdependence.

ethnocentrism The belief that the ways of one's own culture are the only proper ones.

VISUAL COUNTERPOINT

Courtesy of the Center for Mindful Learning

Maria Stenzel/National Geographic Creative

➤ **Figure 1.1 Sleeping Habits across Cultures** Infants in the United States typically sleep apart from their parents, a practice that promotes the cultural norm of eight uninterrupted isolated hours of sleep throughout the life cycle. Cross-cultural research shows that co-sleeping, particularly of mother and baby, and periods of wakefulness during the night are far more common. The photo on the right shows a Nenet family sleeping together in their *chum* (reindeer-skin tent). Nenet people are subarctic reindeer pastoralists living in Siberia. For U.S. infants sleeping alone in cribs, the consequences can be dire. Without breathing cues provided by someone sleeping nearby, infants are more susceptible to sudden infant death syndrome (SIDS), a phenomenon in which a baby, usually between 4 and 6 months old, stops breathing and dies while asleep. The highest rates of SIDS are found among infants in the United States (McKenna et al., 2007). That 50 to 70 million adults in the United States suffer from sleep disorders (Institute of Medicine, 2006) may also be a product of this cultural pattern.

Although other social sciences have predominantly concentrated on contemporary peoples living in North American and European (Western) societies, anthropologists have traditionally focused on non-Western peoples and cultures. Anthropologists work with the understanding that to fully access the complexities of human ideas, behavior, and biology, *all humans*, wherever and whenever, must be studied. A cross-cultural and long-term evolutionary perspective distinguishes anthropology from other social sciences. This approach guards against **culture-bound** theories—theories based on assumptions about the world and reality that come from a researcher's own particular culture.

Consider the case of organ transplantation, a medical practice that has become widespread since the first kidney transplant between identical twin brothers in Boston in 1954. Today transplants between unrelated individuals are common, so much so that organs are trafficked in the black market, often across continents from the poor to the wealthy. To reduce illegal traffic, several European countries have enacted policies that assume that individuals who are brain dead are automatically organ donors unless they have "opted out" ahead of time.

A practice like organ transplantation can only exist if it fits with cultural beliefs about death and the human body. The dominant North American and European view—that the body is a machine that can be repaired much like a car—makes a practice like organ transplant acceptable. But this is not a view all societies share. Anthropologist Margaret Lock has explored differences between Japanese and North American acceptance of the biological state of brain death and how it affects the practice of organ transplants (Lock, 2001).

Brain death relies upon the absence of measurable electrical currents in the brain and the inability to breathe without technological assistance. Brain-dead individuals, though attached to machines, still seem alive with a beating heart and normal skin coloring. Part of the reason why some North Americans find brain death acceptable is that culturally, personhood and individuality are located in the mind/brain. This comfort with brain death has allowed for the "gift of life" through organ donation and subsequent transplantation.

culture-bound Theories about the world and reality based on the assumptions and values of one's own culture.

By contrast, in Japan, the concept of brain death is hotly contested, and organ transplants are rarely performed. The Japanese idea of personhood does not incorporate a mind–body split. Consequently, the Japanese resist accepting a warm body as a corpse from which organs can be harvested. Further, organs cannot be transformed into "gifts" because anonymous donation is not compatible with Japanese social patterns of reciprocal exchange. Organ transplantation carries far greater social meaning than the purely biological movement of an organ from one individual to another. And although this practice may fit with the beliefs of some societies, it may be an opportunity for human rights abuses in another.

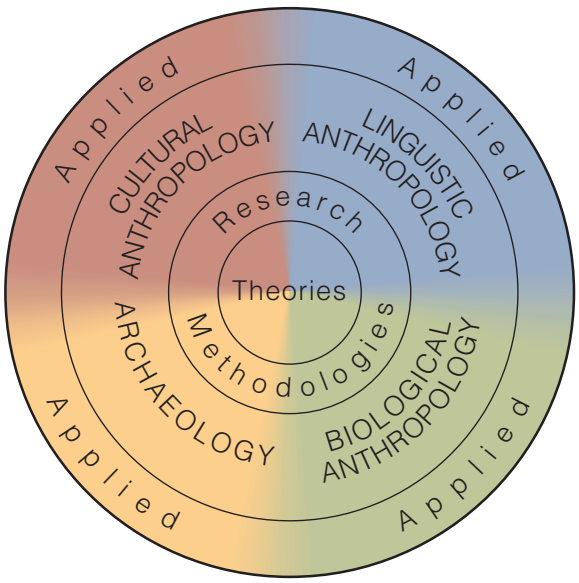
The findings of anthropologists have often challenged the conclusions of sociologists, psychologists, and economists. At the same time, anthropology is absolutely indispensable to those in other disciplines because it provides the only consistent check against culture-bound assertions. In a sense, anthropology is to these disciplines what the laboratory is to physics and chemistry: an essential testing ground for their theories.

Anthropology and Its Fields

Individual anthropologists tend to specialize in one of four fields or subdisciplines: cultural anthropology, linguistic anthropology, archaeology, and biological (physical) anthropology (➤ **Figure 1.2**). Some anthropologists consider archaeology and linguistics as part of a broader study of human cultures, but archaeology and linguistics also have close ties to biological anthropology. For example, although linguistic anthropology focuses on the cultural aspects of language, it has deep connections to the evolution of human language and the biological basis of speech and language studied within physical anthropology.

Researchers in each of anthropology's fields gather and analyze data to explore similarities and differences among humans, across time and space. Moreover, individuals within each of the four fields practice **applied anthropology**, which entails using anthropological knowledge and methods to prevent or solve practical problems. Most applied anthropologists actively collaborate with the communities in which they work—setting goals, solving problems, and conducting research together. In this book, the Anthropology Applied features spotlight how anthropology contributes to solving a wide range of challenges.

One early context in which anthropological knowledge was applied to a practical problem was the international public health movement that began in the 1920s. This marked the beginning of **medical anthropology**—a specialization that brings theoretical and applied approaches from cultural and biological anthropology to the study of human health and disease. The work of medical anthropologists sheds light on connections between human health and political and economic forces, both locally and globally. Examples of this specialization appear in many of the Biocultural Connections featured in this text, including the one presented on the next page, "Picturing Pesticides."



➤ **Figure 1.2 The Four Fields of Anthropology** Note that the divisions between them are not sharp, indicating that their boundaries overlap.

Cultural Anthropology

Cultural anthropology (also called *social* or *sociocultural anthropology*) is the study of patterns of human behavior, thought, and feelings. It focuses on humans as culture-producing and culture-reproducing creatures. To understand the work of cultural anthropologists, we must clarify the meaning of **culture**—a society's shared and socially transmitted ideas, values, and perceptions, which are used

applied anthropology The use of anthropological knowledge and methods to solve practical problems, often for a specific client.

medical anthropology The specialization in anthropology that brings theoretical and applied approaches from cultural and biological anthropology to the study of human sickness and health.

cultural anthropology The study of customary patterns in human behavior, thought, and feelings. It focuses on humans as culture-producing and culture-reproducing creatures. Also known as *social* or *sociocultural anthropology*.

culture A society's shared and socially transmitted ideas, values, and perceptions that are used to make sense of experience and generate behavior and are reflected in behavior.

to make sense of experience and which generate behavior and are reflected in that behavior. These are the (often unconscious) standards by which societies—structured groups of people—operate. These standards are socially learned, rather than acquired through biological inheritance. Cultures may vary considerably from place to place, but no person is "more cultured" in the anthropological sense than any other.

Integral to all the anthropological fields, the concept of culture might be considered anthropology's distinguishing feature. After all, biological anthropologists are distinct from biologists *primarily* because they take culture into account. Cultural anthropologists may study the legal, medical, economic, political, or religious system of a given society, knowing that all aspects of the culture interrelate as part of a unified whole. They may focus on divisions in a society—such as gender, age, or class—factors we will explore in depth later in this text. But it is also worth noting the significance of these same categories to archaeologists who study a society through its material remains, to linguistic anthropologists who examine ancient and modern languages, and to biological anthropologists who investigate the physical human body.

Cultural anthropology has two main components: ethnography and ethnology. An **ethnography** is a detailed description of a particular culture primarily based on **fieldwork**, which is the term *all* anthropologists use for on-location research. Because the hallmark of ethnographic fieldwork is a combination of social participation and personal observation within the community being studied and interviews and discussions with individual members of a group, the ethnographic method is commonly referred to as **participant observation**. Ethnographies provide the information used to make systematic comparisons among cultures all across the world. Known as **ethnology**, such cross-cultural research allows anthropologists to develop theories that help explain why certain important differences or similarities occur among groups.

ethnography A detailed description of a particular culture primarily based on fieldwork.

fieldwork The term anthropologists use for on-location research.

participant observation In ethnography, the technique of learning a people's culture through social participation and personal observation within the community being studied, as well as interviews and discussion with individual members of the group over an extended period of time.

ethnology The study and analysis of different cultures from a comparative or historical point of view, utilizing ethnographic accounts and developing anthropological theories that help explain why certain important differences or similarities occur among groups.

Ethnography

Through participant observation—eating a people's food, sleeping under their roof, learning how to speak and behave acceptably, and personally experiencing their habits and customs—ethnographers seek to gain the best possible understanding of a particular way of life. Being participant observers does not mean that anthropologists must join in battles to study a culture in which warfare is prominent; but by living among warring people, ethnographers should be able to understand how warfare fits into the overall cultural framework.

Ethnographers must observe carefully to gain an overview without placing too much emphasis on one part at the expense of another. Only by discovering how *all* parts of a culture—its social, political, economic, and religious practices and institutions—relate to one another can ethnographers begin to understand the cultural system. Ethnographers' most essential tools are notebooks, pen/pencil, camera, recording devices, and a laptop computer. Most important of all, they need flexible social skills.

The popular image of ethnographic fieldwork is that it occurs among hunters, herders, fishers, or farmers who live in far-off, isolated places. To be sure, much ethnographic work has been done in remote villages of Asia, Africa, or Latin America, islands of the Pacific Ocean, deserts of Australia, and so on. However, as the discipline developed after the mid-1900s with the demise of colonialism, industrialized societies and neighborhoods in modern cities have also become a significant focus of anthropological study.

Ethnographic fieldwork has transformed from expert Western anthropologists studying people in "other" places to a collaborative approach among anthropologists from all parts of the world and the varied communities in which they work. Today, anthropologists from around the globe employ the same research techniques that were used in the study of non-Western peoples to explore diverse subjects such as religious movements, street gangs, refugee settlements, land rights, conflict resolution, corporate bureaucracies, social media, and health care systems in Western cultures.

Ethnology

Largely descriptive in nature, *ethnography* provides raw data needed for *ethnology*—the branch of cultural anthropology that involves cross-cultural comparisons and theories that explain differences or similarities among groups. Intriguing insights into one's own beliefs and practices may come from cross-cultural comparisons. Consider, for example, the amount of time spent on domestic chores by industrialized peoples and traditional food foragers—people who rely on wild plant and animal resources for subsistence.

Anthropological research has shown that food foragers work far less time at domestic tasks and other subsistence pursuits compared to people in industrialized societies. Despite access to "labor-saving" appliances such

BIOCULTURAL CONNECTION

Picturing Pesticides

The toxic effects of pesticides have long been known. After all, these compounds are designed to kill bugs. However, documenting the toxic effects of pesticides on humans has been more difficult, as they are subtle—sometimes taking years to become apparent.

Anthropologist Elizabeth Guillette, working in a Yaqui Indian community in Mexico, combined ethnographic observation, biological monitoring of pesticide levels in blood, and neurobehavioral testing to document the impairment of child development by pesticides.[a] Working with colleagues from the Sonora Institute of Technology in Obregón, Mexico, Guillette compared children and families from two Yaqui communities: one living in farm valleys who were exposed to large doses of pesticides and one living in ranching villages in the foothills nearby.

Guillette documented the frequency of pesticide use among the farming Yaqui to be forty-five times per crop cycle with two crop cycles per year. In the farming valleys, she also noted that families tended to use household bug sprays on a daily basis, thus increasing their exposure to toxic pesticides. In the foothill ranches, she found that the only pesticides that the Yaqui were exposed to consisted of DDT sprayed by the government to control malaria. In these communities, indoor bugs were swatted or tolerated.

Pesticide exposure was linked to child health and development through two sets of measures. First, Guillette examined the levels of pesticides in the blood of valley children at birth and throughout their childhood and found these levels to be far higher than in the children from the foothills. She also documented the presence of pesticides in breast milk of nursing mothers from the valley farms.

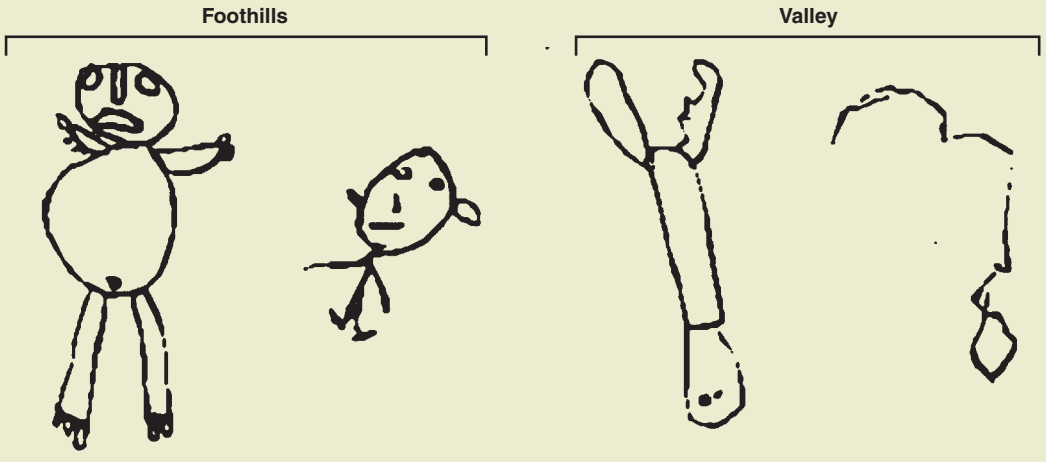
The second study examined the children's performance on a variety of normal childhood activities, such as jumping, memory games, playing catch, and drawing pictures. The children exposed to high doses of pesticides had significantly less stamina, poorer eye–hand coordination, less large motor coordination, and poorer drawing ability compared to the Yaqui children from the foothills. Although these children exhibited no overt symptoms of pesticide poisoning, they did demonstrate delays and impairment in their neurobehavioral abilities that might be irreversible.

Though Guillette's study was thoroughly embedded in one ethnographic community, she emphasizes that the exposure to pesticides among the Yaqui farmers is typical of agricultural communities globally and thus has significance for changing human practices regarding pesticide use everywhere.

Biocultural Questions

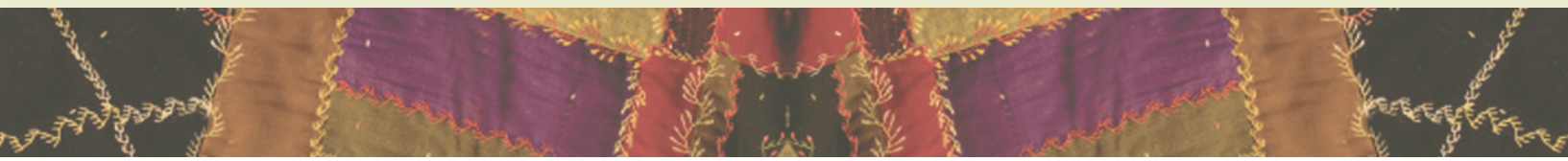
Given the documented developmental damage these pesticides have inflicted on children, should their sale and use be regulated globally? Are potentially damaging toxins in use in your community?

[a]Guillette, E. A., et al. (1998, June). An anthropological approach to the evaluation of preschool children exposed to pesticides in Mexico. *Environmental Health Perspectives 106*, 347.



Compare the drawings typically done by Yaqui children heavily exposed to pesticides (valley) to those made by Yaqui children living in nearby areas who were relatively unexposed (foothills).

Source: From E. A. Guillette, et al. An anthropological approach to the evaluation of preschool children exposed to pesticides. *Mexico, Environmental Perspectives* 106(6), 347–353. Courtesy of Dr. Elizabeth A. Guillette.



as dishwashers, washing machines, clothes dryers, vacuum cleaners, food processors, and microwave ovens, urban dwellers in the United States who are not working for wages outside their homes put 55 hours a week into their housework. In contrast, Aboriginal women in Australia devoted 20 hours a week to their chores (Bodley, 2008, p. 106). Nevertheless, consumer appliances have become important indicators of a high standard of living in the United States due to the widespread belief that household appliances reduce housework and increase leisure time. By making systematic comparisons, ethnologists seek to arrive at scientific explanations concerning the function and operation of cultural practices in all times and places.

Applied Cultural Anthropology

Today, cultural anthropologists contribute to applied anthropology in a variety of contexts ranging from business to education to health care to governmental interventions to humanitarian aid. For example, anthropologist Nancy Scheper-Hughes has taken her investigative work on the global problem of illegal trafficking of organs and used it to help found Organs Watch, an organization dedicated to solving this human rights issue.

Linguistic Anthropology

Perhaps the most distinctive feature of the human species is language. Although the sounds and gestures made by some other species—especially apes—may serve functions comparable to those of human language, no other animal has developed a system of symbolic communication as complex as that of humans. Language allows people to preserve and transmit countless details of their culture from generation to generation.

Linguistic anthropology, the branch of anthropology that studies human languages, investigates their structure, history, and relation to social and cultural contexts. Although it shares data, theories, and methods with the more general discipline of linguistics, it differs in that it includes distinctly anthropological questions, such as, how does language influence or reflect culture? And how does language use differ among distinct members of a society?

In its early years, linguistic anthropology emphasized the documentation of languages of cultures under ethnographic study—particularly those whose future seemed precarious due to colonization, forced assimilation, population decimation, capitalist expansion, or other destructive forces. When the first Europeans began to colonize the world five centuries ago, an estimated 12,000 distinct languages existed. By the early 1900s—when anthropological research began to take off—many languages and peoples had already disappeared or were on the brink of extinction. Sadly this trend continues, with predictions that nearly half of the world's remaining 6,000 languages will become extinct over the next hundred years (Crystal, 2002; Knight, Studdert-Kennedy, & Hurford, 2000).

Language and Beliefs

In the early 20th century, mastery of foreign languages—with grammatical structures so different from the Indo-European and Semitic languages to which Euro-American scholars were accustomed—prompted the notion of *linguistic relativity*. This refers to the idea that linguistic diversity reflects not just differences in sounds and grammar but also differences in ways of making sense of the world. For example, observing that the Hopi Indians of the American Southwest have no words for the concepts of past, present, and future led early proponents of linguistic relativity to suggest that the Hopi people had a unique conception of time (Whorf, 1946).

Complex ideas and practices integral to a culture's survival can also be reflected in language. For example, among the Nuer, a nomadic group that travels with grazing animals throughout South Sudan, a baby born with a visible deformity is not considered a human baby. Instead, it is called a baby hippopotamus. This name allows for the safe return of the "hippopotamus" to the river where it belongs. Such infants would not be able to survive in Nuer society, and so linguistic practice is compatible with the compassionate choice the Nuer have had to make. Similarly, the importance of money within North American culture is evident in the equation of money with time, in phrases such as "time is money," "capitalize on opportunity," and "profiting from mishap."

Some theorists have challenged the notion of linguistic relativity, arguing that the human capacity for language is based on biological universals that underlie all human thought. Cognitive scientist Steven Pinker has even suggested that, at the universal biological level, thought is nonverbal (Pinker, 1994). Whatever the case, a holistic anthropological approach considers language as dependent both on a biological basis all humans share and on specific cultural patterning.

Linguistic anthropology has three main branches: descriptive linguistics, historical linguistics, and language in relation to social and cultural settings. All three yield valuable information about how people communicate and how they understand the world around them.

Descriptive Linguistics

This branch of linguistic anthropology involves the painstaking work of dissecting a language by recording, delineating, and analyzing all its features. It leads to a deeper understanding of a language—its structure (including grammar and syntax), its unique linguistic repertoire (figures of speech, word plays, and so on), and its relationship to other languages.

linguistic anthropology The study of human languages.

archaeology The study of human cultures through the recovery and analysis of material remains and environmental data.

Historical Linguistics

Languages, like cultures, are alive, malleable, and changing. Online tools such as Urban Dictionary track the changes in North American slang, and traditional dictionaries include new words and usages each year. Historical linguists track these changes to increase understanding of the human past. By working out relationships among languages and examining their spatial distributions, these specialists may estimate how long the speakers of those languages have lived where they do. By identifying those words in related languages that have survived from an ancient ancestral tongue, anthropological linguists can also suggest not only where but also *how* speakers of an ancestral language lived. Such work has shown, for example, how the Bantu family of languages spread from its origins in western Africa (in the region of today's Nigeria and Cameroon) to the majority of the continent. Over the course of several millennia, Bantu-speaking peoples came to inhabit most of sub-Saharan Africa, bringing their language, farming technology, and other aspects of their culture with them.

Language in Its Social and Cultural Settings

Some linguistic anthropologists study the social and cultural contexts of a language. Focusing on specific speech events, they may research how factors such as age, gender, ethnicity, class, religion, occupation, or financial status affect speech (Hymes, 1974). Because members of any culture may use a variety of different registers and inflections, the ones they choose (often unconsciously) to use at a specific instance convey particular meanings. For example, linguistic anthropologists might examine whether U.S. women's tendency to end statements with an upward inflection, as though the statements were questions, reflects a pattern of male dominance in this society. Because members of any culture may use a variety of different registers and inflections, the ones they choose to express their thoughts at specific instances can convey particular meanings.

Linguistic anthropologists also focus on the socialization process through which individuals become part of a culture. Children take on this fundamental task as they grow and develop, but it can be seen in adults as well. Adults may need to assimilate because of a geographic move or because they are taking on a professional identity. First-year medical students, for example, amass 6,000 new vocabulary words and a series of linguistic conventions as they begin to take on the role of physicians.

Applied Linguistic Anthropology

Linguistic anthropologists put their research to use in a number of settings. Some, for example, have collaborated with recently contacted cultural groups, small nations (or tribes), and ethnic minorities in preserving or reviving languages suppressed or lost during periods of oppression by dominant societies. Their work has included helping to create written forms of languages that previously existed only orally. This sort of applied linguistic anthropology represents a trend in mutually useful collaboration that is characteristic of much anthropological research today (➤ **Figure 1.3**).

Archaeology

Archaeology is the branch of anthropology that studies human cultures through recovery and analysis of material remains and environmental data. Such material products

© Living Tongues Institute

➤ **Figure 1.3** **Preserving Endangered Languages** Linguistic anthropologist Greg Anderson (right) has devoted his career to saving indigenous languages. He founded and heads the Living Tongues Institute for Endangered Languages and works throughout the globe to preserve languages that are dying out at a shocking rate of about one every two weeks. Here he is recording for the first time the language of Koro, spoken by some 1,000 people in India's remote northeastern state, Arunachal Pradesh.

include tools, pottery, hearths, and enclosures that remain as traces of cultural practices in the past, as well as human, plant, and marine remains, some dating back 2.5 million years. The arrangement of these traces, as much as the traces themselves, reflects specific human ideas and behavior. For example, shallow, restricted concentrations of charcoal that include oxidized earth, bone fragments, and charred plant remains, located near pieces of fire-cracked rock, pottery, and tools suitable for food preparation, indicate cooking and food processing. Such remains can reveal much about a people's diet and subsistence practices.

In addition to asking specific questions about a single group of people at a specific place and time, archaeologists also use material remains to investigate broad questions such as settlement or migration patterns across vast areas, such as the peopling of the Americas or the spread of the earliest humans from Africa. Together with skeletal remains, material remains help archaeologists reconstruct the biocultural context of past human lifeways and patterns. Archaeologists organize this material through time and use it to explain cultural variability and change through time. Although archaeologists tend to specialize in particular regions or time periods, a number of topical subspecializations also exist.

Historical Archaeology

Compared to historians, who rely on written records, archaeologists can reach much further back in time for clues to human behavior. But to call a society without written records, "prehistoric" does not mean that these past peoples were less interested in their history or that they did not have ways of recording and transmitting information. It simply means that written records do not exist.

That said, archaeologists are not limited to the study of societies without written records; they may study those for which historic documents are available to supplement the material remains. **Historical archaeology**, the archaeological study of places for which written records exist, often provides data that differ considerably from the historical record. In most literate societies, written records are associated with governing elites rather than with farmers, fishers, laborers, or slaves, and therefore they include biases of the ruling classes. In fact, in many historical contexts, "material culture may be the most objective source of information we have" (Deetz, 1977, p. 160).

Bioarchaeology

A number of archaeological specializations deal with preserving cultural practices in the remains of living things. **Bioarchaeology**, the study of human remains—bones, skulls, teeth, and sometimes hair, dried skin, or other tissue—emphasizes the preservation of cultural and social processes in skeletons. For example, mummified skeletal remains from the Andean highlands in South America preserve not only this burial practice but also provide evidence of some of the earliest brain surgery ever documented. In addition, these bioarchaeological remains exhibit skull deformations, which were used to distinguish nobility from other members of society.

Other specializations include archaeological ethnobotany, the study of how past peoples made use of indigenous plants. Zoorchaeology, tracking animal remains recovered in excavations is another archaeological specialization.

Contemporary Archaeology

Although most archaeologists concentrate on the past, some study material objects in contemporary settings, and that includes garbage dumps. Just as a 3,000-year-old shell mound (*midden*) on the seacoast of Tierra del Fuego at the tip of South America offers significant clues about prehistoric communities living on mussels, oysters, fish, and other natural resources, modern garbage dumps provide evidence of everyday life in contemporary societies. For large cities like New York, the accumulation of daily garbage is staggering. In just a few centuries, millions of inhabitants have dumped so much trash that this urban area has been physically raised 6 to 30 feet—primarily from discarded newspapers and rubble from demolition and building construction, but also from huge amounts of plastic and household and office supplies and equipment (Rathje & Murphy, 2001).

One of the earliest anthropological studies of modern garbage—University of Arizona's Garbage Project—began with a study of household waste of Tucson residents in 1973. When surveyed by questionnaires, only 15 percent of households reported consuming beer, and none reported an intake of more than eight cans a week. Analysis of garbage from the same area showed that 80 percent of the households consumed some beer, and 50 percent discarded more than eight cans per week (Rathje & Murphy, 2001).

Beyond providing data on beer consumption, the Garbage Project has tested the validity of research survey techniques, upon which sociologists, economists, other social scientists, and policymakers rely heavily. The tests show a significant difference between what people *say* they do and what garbage analysis shows they *actually* do.

Applied Archaeology

The Garbage Project also gives us a fine example of applied archaeology. Its program of excavating landfills in different parts of North America, initiated in 1987, produced the first reliable data on what materials actually go into landfills and what happens to them there. Again, common beliefs turned out to be at odds with the actual situation. For example, when buried in deep compost landfills, biodegradable materials such as newspapers take far longer to decay than anyone had expected. This kind of information helps solve waste

historical archaeology The archaeological study of places for which written records exist.

bioarchaeology The archaeological study of human remains, emphasizing the preservation of cultural and social processes in the skeleton.

Department of Anthropology, Smithsonian Museum of Natural History

➤ **Figure 1.4** **Kennewick Man** The "Ancient One" and the "Kennewick Man" both refer to the 9,300-year-old skeletal remains that were found in 1996 near Kennewick, Washington. Surrounded by controversy since its discovery, Kennewick Man is among the oldest human remains ever unearthed in the Western Hemisphere and has great potential to advance scientific understanding of ancient lifeways and migration patterns in the Americas. Because Kennewick Man was found within their ancestral homelands, a group of Native American tribes claimed the remains under the Native American Graves Protection and Repatriation Act (NAGPRA). Viewing these human bones as belonging to ancestors, they wish to return them to the earth in a respectful ceremony. Scientists challenged this in federal court, and in 2004 the scientists were granted permission to continue research and analysis of the remains. Doug Owsley (pictured on right), the forensic anthropologist from the Smithsonian Institution who is leading the research team, has said that scientific investigation is yielding even more information than expected. Because conflicting worldviews are at the center of this controversy, it is unlikely that it will be easily resolved.

disposal problems. The data gathered from the Garbage Project's landfill studies on hazardous wastes and rates of decay of various materials play a major role in landfill regulation and management today (Rathje & Murphy, 2001).

Cultural Resource Management

Although archaeology may conjure up images of ancient pyramids and the like, much archaeological fieldwork is carried out as **cultural resource management**. What distinguishes this work from traditional archaeological research is that it is a legally required part of any activity that might threaten important aspects of a country's prehistoric and historic heritage. Many countries, from Chile to China, use archaeological expertise to protect and manage their cultural heritage.

In the United States, for example, if a construction company plans to replace a highway bridge, it must first contract with archaeologists to identify and protect any significant prehistoric or historic resources that might be affected by new construction. And when cultural resource management work or other archaeological investigation unearths Native American cultural items or human remains, federal laws come into the picture again. The Native American Graves Protection and Repatriation Act (NAGPRA), passed in 1990, provides a process for the return of these remains, especially human bones and burial gifts (such as copper jewelry, weapons, and ceramic bowls), to lineal descendants, culturally affiliated Indian tribes, and Native Hawaiian organizations (➤ **Figure 1.4**).

cultural resource management A branch of archaeology concerned with survey and/or excavation of archaeological and historical remains that might be threatened by construction or development; also involved with policy surrounding protection of cultural resources.

In addition to working in all the capacities mentioned, archaeologists also consult for engineering firms to help them prepare environmental impact statements. Some of these archaeologists operate out of universities and colleges, while others are on the staff of independent consulting firms. When state legislation sponsors any kind of archaeological work, it is referred to as *contract archaeology*.

Biological Anthropology

Biological anthropology, also called *physical anthropology,* focuses on humans as biological organisms. Traditionally, biological anthropologists concentrated on human evolution, primatology, growth and development, human adaptation, and forensics. Today, **molecular anthropology**, or the anthropological study of genes and genetic relationships, contributes significantly to our understanding of human evolution (paleogenetics), adaptation, and diversity. Comparisons among groups separated by time, geography, or the frequency of a particular gene can reveal how humans have adapted and where they have migrated. As experts in the anatomy of human bones and tissues, biological anthropologists lend their knowledge about the body to applied areas such as gross anatomy laboratories, public health, and criminal investigations.

Paleoanthropology

Dealing with much greater time spans than other branches of anthropology, **paleoanthropology** is the study of the origins, predecessors, and early representatives of the present human species. Focusing on long-time biological changes (evolution), paleoanthropologists seek to understand how, when, and why we became the species we are today. In biological terms, we humans are *Homo sapiens*, a species in the larger order of primates, one of the many kinds of mammals. Because we share a common ancestry with other primates (monkeys and apes), paleoanthropologists look back to the earliest primates (65 or so million years ago, abbreviated mya), or even the earliest mammals (225 mya), to reconstruct the complex path of human evolution. Paleoanthropology, unlike other evolutionary studies, takes a **biocultural** approach, focusing on the interaction of biology and culture.

biological anthropology The systematic study of humans as biological organisms. Also known as *physical anthropology*.

molecular anthropology The anthropological study of genes and genetic relationships, which contributes significantly to our understanding of human evolution, adaptation, and diversity.

paleoanthropology The anthropological study of biological changes through time (evolution) to understand the origins and predecessors of the present human species.

biocultural An approach that focuses on the interaction of biology and culture.

primatology The study of living and fossil primates.

Paleoanthropologists compare fossilized skeletons of our ancestors to other fossils and to the bones of living members of our species. Combining this knowledge with biochemical and genetic evidence, they strive to scientifically reconstruct the complex course of human evolutionary history. With each new fossil discovery, paleoanthropologists have another piece to add to the puzzle. As we will see in later chapters, genetic evidence establishes the close relationship between humans and the African ape species—chimpanzees, bonobos, and gorillas. Genetic analyses indicate that the distinctive human line split from the apes sometime between 5 and 8 million years ago.

Primatology

Studying the anatomy and behavior of other primates helps us understand what we share with our closest living relatives and what makes humans unique. Therefore, **primatology**, or the study of living and fossil primates, is a vital part of biological anthropology. Primates include the Asian and African apes, as well as monkeys, lemurs, lorises, and tarsiers.

Biologically, humans are members of the ape family—large-bodied, broad-shouldered primates with no tail. Detailed studies of ape behavior in the wild indicate that sharing learned behavior is a significant part of their social life. Increasingly, primatologists designate the shared, learned behavior of nonhuman apes as *culture*. Primate studies offer scientifically grounded perspectives on the behavior of our ancestors, as well as greater appreciation and respect for the abilities of our closest living relatives. As human activity encroaches on all parts of the world, many primate species are endangered. Primatologists such as Jane Goodall (➤ **Figure 1.5**) strongly advocate for the preservation of primate habitats so that these remarkable animals will be able to continue to inhabit the earth with us.

Human Growth, Adaptation, and Variation

Some biological anthropologists specialize in the study of human growth and development. They examine biological mechanisms of growth as well as the impact of the environment on the growth process. For example, Franz Boas, a pioneer of American anthropology in the early 20th century, compared the heights of immigrants who spent their childhood in the "old country" (Europe) to the increased heights obtained by their children who grew up in the United States. Today, biological anthropologists study the impact of disease, pollution, and poverty on growth. Comparisons between human and nonhuman primate growth patterns can provide clues to the evolutionary history of humans. Detailed anthropological studies of hormonal, genetic, and physiological bases of healthy growth in living humans also contribute significantly to the health of children today.

Studies of human adaptation focus on the capacity of humans to adapt or adjust to their material environment—biologically and culturally. This branch of biological

AP Images/Jean-Marc Bouju

➤ **Figure 1.5 Primatologist Jane Goodall** Nearly forty-five years ago, Jane Goodall began studying chimpanzees to shed light on the behavior of our distant ancestors. The knowledge she has amassed reveals striking similarities with our species. Goodall has devoted much of her career to championing the rights of our closest living relatives.

anthropology takes a comparative approach to humans living today in a variety of environments. Humans are the only primate group to inhabit the entire earth. Though cultural adaptations make it possible for humans to live in some environmental extremes, biological adaptations also contribute to survival in extreme cold, heat, and high altitude.

Some of these biological adaptations are built into the genetic makeup of populations. The long period of human growth and development provides ample opportunity for the environment to shape the human body. *Developmental adaptations* are responsible for some features of human variation such as the enlargement of the right ventricle of the heart to help push blood to the lungs among the Quechua Indians of the altiplano, part of the Andean highlands that extend along the western rim of South America. *Physiological adaptations* are short-term changes in response to a particular environmental stimulus. For example, if a woman who normally lives at sea level flies to La Paz, Bolivia—a city at an altitude of 3,660 meters (nearly 12,000 feet)—her body will undergo a series of physiological responses, such as increased production of the red blood cells that carry oxygen. All of these kinds of biological adaptations contribute to present-day human variation.

Genetically-based human differences include visible traits such as height, body build, and skin color, as well as biochemical factors such as blood type and susceptibility to certain diseases. Still, we remain members of a single species. Biological anthropology applies all the techniques of modern biology to achieve fuller understanding of human variation and its relationship to the different environments in which people have lived. Physical anthropologists' research on human variation has debunked false notions of biologically defined races, a notion based on widespread misinterpretation of human variation.

Forensic Anthropology

The application of the science of biological anthropology to legal settings is called **forensic anthropology**. In addition to helping law enforcement authorities identify murder victims and perpetrators, forensic anthropologists investigate human rights abuses such as systematic genocide, terrorism, and war crimes. These specialists use genetic information and details of skeletal anatomy to establish characteristics such as age, sex, population affiliation, or stature. Forensic anthropologists can also determine whether a person was right- or left-handed, exhibited any physical abnormalities, or had experienced trauma.

Although forensics relies upon differing frequencies of certain skeletal characteristics to establish population affiliation, it is nevertheless false to say that all people from a given population have a particular type of skeleton. (See the Anthropology Applied feature to read about the work of several forensic anthropologists and forensic archaeologists.)

forensic anthropology The analysis of human biological and cultural remains for legal purposes.

ANTHROPOLOGY APPLIED

Forensic Anthropology: Voices for the Dead

The work of Clyde C. Snow, Karen Burns, Amy Zelson Mundorff, and Michael Blakey

Forensic anthropology is the analysis of biological and cultural remains for legal purposes. Law enforcement authorities call upon forensic anthropologists to use such remains to identify murder victims, missing people, or people who have died in disasters, such as plane crashes. Forensic anthropologists have also contributed substantially to the investigation of human rights abuses in all parts of the world by identifying victims and documenting the cause of their death.

Among the best-known forensic anthropologists is Clyde C. Snow. He has been practicing in this field for forty years, first for the Federal Aviation Administration and more recently as a freelance consultant. In addition to the usual police work, Snow has studied the remains of General George Armstrong Custer and his men from the 1876 battlefield at Little Bighorn, and in 1985 he went to Brazil, where he identified the remains of the notorious Nazi war criminal Josef Mengele.

Snow was also instrumental in establishing the first forensic team devoted to documenting cases of human rights abuses around the world. This began in 1984 when he went to Argentina at the request of a newly elected civilian government to help with the identification of remains of the *desaparecidos*, or "disappeared ones," the 9,000 or more people who were eliminated by government death squads during seven years of military rule. A year later, he returned to give expert testimony at the trial of nine junta members and to teach Argentineans how to recover, clean, repair, preserve, photograph, x-ray, and analyze bones. Besides providing factual accounts of the fate of victims to their surviving kin and refuting the assertions of revisionists that the massacres never happened, the work of Snow and his Argentinean associates was crucial in convicting several military officers of kidnapping, torture, and murder.

Since Snow's pioneering work, forensic anthropologists have become increasingly involved in investigations of human rights abuses in all parts of the world—from Chile to Guatemala, Haiti, the Philippines, Rwanda, Iraq, Bosnia, and Syria. Meanwhile, they continue to do important work for more typical clients. In the United States, these clients include the Federal Bureau of Investigation and city, state, and county medical examiners' offices.

Forensic anthropologists concentrating on skeletal remains commonly work closely with forensic archaeologists. Their interaction is rather like that between a forensic pathologist, who examines a corpse to establish time and manner of death, and a crime scene investigator, who searches the site for clues. Although forensic anthropologists deal with human remains—often only bones and teeth—forensic archaeologists control the site, recording the position of all the relevant finds and recovering any clues associated with the remains.

In Rwanda, for example, a team assembled in 1995 to investigate a mass atrocity for the United Nations included archaeologists from the U.S. National Park Service's Midwest Archeological Center. They performed the standard archaeological procedures of mapping the site, determining its boundaries, photographing and recording all surface finds, and excavating, photographing, and recording buried skeletons and associated materials in mass graves.[a]

In another example, Karen Burns of the University of Georgia was part of a team sent to northern Iraq after the 1991 Gulf War to investigate alleged atrocities. On a military base where there had been many executions, she excavated the remains of a man's body found lying on its side facing Mecca, conforming to Islamic practice. Although there was no intact clothing, two threads of polyester used to sew clothing were found

Anthropology, Science, and the Humanities

Anthropology has been called the most humane of the sciences and the most scientific of the humanities—a designation that most anthropologists accept with pride. Given their intense involvement with people of all times and places, anthropologists have amassed considerable information about human failure and success, weakness and greatness—the real stuff of the humanities.

Anthropologists remain committed to the proposition that one cannot fully understand another culture by simply observing it; one must *experience* it as well. A commitment to fieldwork and to the systematic collection of data, whether it is qualitative or quantitative, also demonstrates the scientific side of anthropology. Anthropology is an **empirical** social science based on observations

empirical An approach based on observations of the world rather than on intuition or faith.

AP Images/Rodrigo Abd

The excavation of mass graves by the Guatemalan Forensic Anthropology Foundation (Fernando Moscoso Moller, director) documents the human rights abuses committed during Guatemala's bloody civil war, a conflict that left 200,000 people dead and another 40,000 missing. In 2009, in a mass grave in the Quiche region, Diego Lux Tzunux uses his cell phone to photograph the skeletal remains believed to belong to his brother Manuel who disappeared in 1980. Genetic analysis allows forensic anthropologists to confirm the identity of individuals so that family members can know the fate of their loved ones. The analysis of skeletal remains provides evidence of the torture and massacre these individuals sustained.

along the sides of both legs. The clothing, because it was made of natural fibers, decayed. Only the threads survived. "Those two threads at each side of the leg just shouted that his family didn't bury him," says Burns.[b] Proper though his position was, no Islamic family would bury their own in a garment sewn with polyester thread; proper ritual would require a simple shroud.

In recent years, two major anthropological analyses of skeletal remains have occurred in New York City, dealing with both present and past atrocities. Amy Zelson Mundorff, a forensic anthropologist for the city's Office of the Chief Medical Examiner, was injured in the World Trade Center terrorist attack on September 11, 2001. Two days later, she returned to work to supervise and coordinate the management, treatment, and cataloguing of people who lost their lives in the tragedy.

Also in lower Manhattan, in 1991, construction workers discovered an African burial ground dating from the 17th and 18th centuries. Archaeological investigation of the burial ground revealed the horror of slavery in North America; researchers' findings showed that even young children were worked to such an extreme that their spines were fractured. Biological archaeologist Michael Blakey, who led the research team, notes:

> Although bioarchaeology and forensics are often confused, when skeletal biologists use the population as the unit of analysis (rather than the individual), and incorporate cultural and historical context (rather than simply ascribing biological characteristics), and report on the lifeways of a past community (rather than on a crime for the police and courts), it is bioarchaeology rather than forensics.[c]

As we have just seen, forensic anthropologists and bioarchaeologists analyze human remains for a variety of purposes. Their work makes a vital contribution to the documentation and correction of atrocities committed by humans of the past and present.

[a]Conner, M. (1996). The archaeology of contemporary mass graves. *SAA Bulletin 14* (4), 6, 31.
[b]Cornwell, T. (1995, November 10). Skeleton staff. *Times Higher Education*, 20.
[c]Blakey, M. (2003, October 29). Personal communication.

or information about humans taken in through the senses and verified by others, rather than on intuition or faith. Anthropology is distinguished from other sciences by the diverse ways in which scientific research is conducted within this discipline.

Science, a carefully honed way of producing knowledge, aims to reveal and explain the underlying logic, the structural processes of our world. A creative scientific endeavor seeks testable explanations for observed phenomena, ideally in terms of the workings of hidden but unchanging principles or laws. Two basic ingredients are essential for this: imagination and skepticism. Imagination, though having the potential to lead us astray, helps us recognize unexpected ways phenomena might be ordered and to think of old things in new ways. Without it, there can be no science. Skepticism allows us to distinguish fact (an observation independently verified by others) from fancy, to test our speculations, and to prevent our imaginations from running wild. In their search for explanations, scientists do not assume that things are always as they appear on the surface. After all, what could be more obvious than the earth staying still while the sun travels around it every day?

Like other scientists, anthropologists often begin their research with a **hypothesis** (a tentative explanation or hunch) about possible relationships among certain observed facts or events. By gathering various kinds of data that seem to ground such suggested explanations on evidence, anthropologists come up with a **theory**—an explanation supported by a reliable body of data. Theories guide us in our explorations and may result in new knowledge. Efforts to demonstrate connections among *known* facts or events may yield *unexpected* facts, events, or relationships. Newly discovered facts may provide evidence that certain explanations, however popular or firmly believed to be true, are unfounded. Without supporting evidence promising hypotheses must be dropped. Moreover, no scientific theory—no matter how widely accepted by the international community of scholars—is beyond challenge. In other words, anthropology relies on empirical evidence.

It is important to distinguish between scientific theories—which are always open to future challenges born of new evidence or insights—and doctrine. A **doctrine**, or dogma, is an assertion of opinion or belief formally handed down by an authority as true and indisputable. For instance, those who accept a creationist doctrine on the origin of the human species as recounted in sacred texts or myths do so on the basis of religious authority, conceding that such views may be contrary to genetic, geological, biological, or other explanations. Such doctrines cannot be tested or proved one way or another: They are accepted as matters of faith.

Straightforward though the scientific approach may seem, its application is not always easy. For instance, once a hypothesis has been proposed, the person who suggested it is strongly motivated to verify it, and this can cause one to unwittingly overlook negative evidence and unanticipated findings. Because culture provides humans with their concepts and shapes our very thoughts, scientists might not see that their hypotheses or interpretations are culture-bound. But by using the anthropological principle that culture shapes our thoughts, scientists can think outside the "culture box" to frame their hypotheses and interpretations. By encompassing both humanism and science, the discipline of anthropology can also draw on its internal diversity to overcome the limits culture can impose on scientific inquiry.

hypothesis A tentative explanation of the relationships among certain phenomena.

theory In anthropology, an explanation of cultural or natural phenomena, supported by reliable data.

doctrine An assertion of opinion or belief formally handed down by an authority as true and indisputable.

Doing Anthropology in the Field

Keenly aware that their personal and cultural background may shape their research questions or even affect their actual observations, anthropologists rely heavily on a technique that has been successful in other disciplines: They immerse themselves in the data to the fullest extent possible. In the process, anthropologists become so thoroughly familiar with even the smallest details that they can begin to recognize underlying patterns in the data, many of which might have been overlooked. Recognition of such patterns enables anthropologists to frame meaningful hypotheses, which then may be subjected to further testing or validation in the field. Within anthropology, fieldwork completes total immersion in the data.

Although fieldwork was introduced earlier in the chapter in connection with cultural anthropology, it is characteristic of *all* the anthropological subdisciplines. Archaeologists and paleoanthropologists excavate sites in the field. A biological anthropologist interested in the effects of globalization on nutrition and growth will live in the field among a community of people to study this question. A primatologist might live among a group of chimpanzees or baboons just as a linguist will study the language of a community by living with that group. Such immersion challenges anthropologists to be constantly aware of ways that cultural factors influence research questions. Anthropological researchers self-monitor through constantly checking their own biases and assumptions as they work; they present these self-reflections along with their observations, a practice known as *reflexivity*.

Unlike many other social scientists, anthropologists usually do not go into the field armed with prefigured questionnaires. Though they will have completed considerable background research and devised tentative hypotheses, anthropologists recognize that maintaining an open mind can lead to many of the best discoveries. As fieldwork proceeds, anthropologists sort out their observations, sometimes by formulating and testing limited or low-level hypotheses or by intuition. Anthropologists work closely with the community so that the research process becomes a collaborative effort. The results are constantly checked for consistency, for if the parts fail to fit together in a manner that is consistent, then anthropologists know that a mistake may have been made and that further inquiry is necessary. Anthropologists establish validity, or the reliability of the research conclusions, through the replication of observations and/or experiments by other researchers. It then becomes obvious if one's colleagues have gotten it right.

Validation by others is uniquely challenging in anthropology due to access. Contact with a particular

research site can be constrained by difficulties of travel, obtaining permits, insufficient funding, or social, political, and environmental conditions. What may be observed in a certain context at a certain time may not be at others. Thus, one researcher cannot easily confirm the reliability or completeness of another's account. For this reason, anthropologists bear a special responsibility for accurate reporting. In the final research report, they must be clear about several basic things: Why was a particular location selected as a research site? What were the research objectives? What were local conditions during fieldwork? Which local individuals provided key information and major insights? How were the data collected and recorded? How did the researchers check their own biases? Without such background information, it is difficult for others to judge the validity of the account and the soundness of the researcher's conclusions.

On a personal level, fieldwork requires researchers to step out of their cultural comfort zone into a world that is unfamiliar and sometimes unsettling. Anthropologists in the field are likely to face a host of challenges—physical, social, mental, political, and ethical. They may have to deal with the physical challenge of adjusting to unfamiliar food, climate, and hygiene conditions. Typically, anthropologists in the field struggle with emotional and psychological challenges such as loneliness, feeling like perpetual outsiders, being socially awkward in their new cultural setting, and having to be alert around the clock because anything that is happening or being said may be significant to their research. Political challenges include the possibility of unwittingly letting themselves be used by factions within the community, or being viewed with suspicion by government authorities who may see them as spies. And there are ethical dilemmas: What does one do if faced with a troubling cultural practice such as female circumcision? How do anthropologists deal with demands for food supplies or medicine? Is it acceptable to use deception to gain vital information?

At the same time, fieldwork often leads to tangible and meaningful personal, professional, and social rewards, ranging from lasting friendships to vital knowledge and insights concerning the human condition. The following Original Study featuring arctic archaeologist Anne Jensen and the Inupiat Eskimo community of Barrow, Alaska, conveys some of the meaning and impact of anthropological research in a context of mutual cooperation and respect.

ORIGINAL STUDY

Whispers from the Ice

By Sherry Simpson

People grew excited when a summer rainstorm softened the bluff known as Ukkuqsi, sloughing off huge chunks of earth containing remains of historic and prehistoric houses, part of the old village that predates the modern community of Barrow. Left protruding from the slope was a human head. Archaeologist Anne Jensen happened to be in Barrow buying strapping tape when the body appeared. Her firm, SJS Archaeological Services, Inc., was closing a field season at nearby Point Franklin, and Jensen offered the team's help in a kind of archaeological triage to remove the body before it eroded completely from the earth.

The North Slope Borough hired her and Glenn Sheehan, both associated with Pennsylvania's Bryn Mawr College, to conduct the work. The National Science Foundation, which supported the three-year Point Franklin project, agreed to fund the autopsy and subsequent analysis of the body and artifacts. The Ukkuqsi excavation quickly became a community event. In remarkably sunny and calm weather, volunteers troweled and picked through the thawing soil, finding trade beads, animal bones, and other items. Teenage boys worked alongside grandmothers. The smell of sea mammal oil, sweet at first then corrupt, mingled with ancient organic odors of decomposed vegetation. One man searched the beach for artifacts that had eroded from the bluff, discovering such treasures as two feather parkas.

Elder Silas Negovanna, originally of Wainwright, visited several times, "more or less out of curiosity to see what they have in mind," he said. George Leavitt, who lives in a house on the bluff, stopped by one day while carrying home groceries and suggested a way to spray water to thaw the soil without washing away valuable artifacts. Tour groups added the excavation to their rounds.

Continued on next page

ORIGINAL STUDY *(continued)*

"This community has a great interest in archaeology up here just because it's so recent to their experience," says oral historian Karen Brewster, a tall young woman who interviews elders as part of her work with the North Slope Borough's division of Inupiat History, Language, and Culture. "The site's right in town, and everybody was really fascinated by it."

Slowly, as the workers scraped and shoveled, the earth surrendered its historical hoard: carved wooden bowls, ladles, and such clothing as a mitten made from polar bear hide, bird-skin parkas, and mukluks. The items spanned prehistoric times, dated in Barrow to before explorers first arrived in 1826.

The work prompted visiting elders to recall when they or their parents lived in traditional sod houses and relied wholly on the land and sea for sustenance. Some remembered sliding down the hill as children, before the sea gnawed away the slope. Others described the site's use as a lookout for whales or ships. For the archaeologists, having elders stand beside them and identify items and historical context is like hearing the past whispering in their ears. Elders often know from experience, or from stories, the answers to the scientists' questions about how items were used or made. "In this instance, usually the only puzzled people are the archaeologists," jokes archaeologist Sheehan.

A modern town of 4,000, Barrow exists in a cultural continuum, where history is not detached or remote but still pulses through contemporary life. People live, hunt, and fish where their ancestors did, but they can also buy fresh vegetables at the store and jet to other places. Elementary school classes include computer and Inupiaq language studies. Caribou skins, still ruddy with blood, and black brant carcasses hang near late-model cars outside homes equipped with television antennas. A man uses power tools to work on his whaling boat. And those who appear from the earth are not just bodies, but relatives. "We're not a people frozen in time," says Jana Harcharek, an Inupiat Eskimo who teaches Inupiaq and nurtures her culture among young people. "There will always be that connection between us [and our ancestors]. They're not a separate entity."

The past drew still closer as the archaeologists neared the body. After several days of digging through thawed soil, they used water supplied by the local fire station's tanker truck to melt through permafrost until they reached the remains, about 3 feet below the surface. A shell of clear ice encased the body, which rested in what appeared to be a former meat cellar. With the low-pressure play of water from the tanker, the archaeologists teased the icy casket from the frozen earth, exposing a tiny foot. Only then did they realize they had uncovered a child. "That was kind of sad, because she was about my daughter's size," says archaeologist Jensen.

The girl was curled up beneath a baleen toboggan and part of a covering that Inupiat elder Bertha Leavitt identified as a kayak skin by its stitching. The child, who appeared to be 5 or 6, remained remarkably intact after her dark passage through time. Her face was cloaked by a covering that puzzled some onlookers. It didn't look like human hair, or even fur, but something with a feathery residue. Finally they concluded it was a hood from a feather parka made of bird skins. The rest of her body was delineated muscle that had freeze-dried into a dark brick-red color. Her hands rested on her knees, which were drawn up to her chin. Frost particles coated the bends of her arms and legs.

"We decided we needed to go talk to the elders and see what they wanted, to get some kind of feeling as to whether they wanted to bury her right away, or whether they were willing to allow some studies in a respectful manner—studies that would be of some use to residents of the North Slope," Jensen says. Working with community elders is not a radical idea to Jensen or Sheehan, whose previous work in the Arctic has earned them high regard from local officials who appreciate their sensitivity. The researchers feel obligated not only to follow community wishes, but also to invite villagers to sites and to share all information through public presentations. In fact, Jensen is reluctant to discuss findings with the press before the townspeople themselves hear it.

"It seems like it's a matter of simple common courtesy," she says. Such consideration can only help researchers, she points out. "If people don't get along with you, they're not going to talk to you, and they're liable to throw you out on your ear." In the past, scientists were not terribly sensitive about such matters, generally regarding human remains—and sometimes living natives—as artifacts themselves. Once, the girl's body would have been hauled off to the catacombs of some university or museum, and relics would have disappeared into exhibit drawers in what Sheehan describes as "hit-and-run archaeology."

"Grave robbers" is how Inupiat Jana Harcharek refers to early Arctic researchers. "They took human remains and their burial goods. It's pretty gruesome. But, of course, at the time they thought they were doing

Fieldwork cooperation and the comparative method cut across all anthropological fields. Still, some particular methods are characteristic only of paleoanthropology and archaeology with their focus on humans and their ancestors in the distant past. Other methods are typical of research focused on the cultures of contemporary societies. Some additional methods particular to primatology and linguistic anthropology will be described in Chapters 3 and 9, respectively.

science a big favor. Thank goodness attitudes have changed."

Today, not only scientists but also municipal officials confer with the Barrow Elders Council when local people find skeletons from traditional platform burials out on the tundra, or when bodies appear in house mounds. The elders appreciate such consultations, says Samuel Simmonds, a tall, dignified man known for his carving. A retired Presbyterian minister, he presided at burial ceremonies of the famous "frozen family," ancient Inupiats discovered in Barrow thirteen years ago. "They were part of us, we know that," he says simply, as if the connection between old bones and bodies and living relatives is self-evident. In the case of the newly discovered body, he says, "We were concerned that it was reburied in a respectful manner. They were nice enough to come over and ask us."

The elders also wanted to restrict media attention and prevent photographs of the body except for a few showing her position at the site. They approved a limited autopsy to help answer questions about the body's sex, age, and state of health. She was placed in an orange plastic body bag in a stainless steel morgue with the temperature turned down to below freezing.

With the help of staff at the Indian Health Service Hospital, Jensen sent the girl's still-frozen body to Anchorage's Providence Hospital. There she assisted with an autopsy performed by Dr. Michael Zimmerman of New York City's Mount Sinai Hospital. Zimmerman, an expert on prehistoric frozen bodies, had autopsied Barrow's frozen family in 1982, and was on his way to work on the prehistoric man recently discovered in the Alps.

The findings suggest the girl's life was very hard. She ultimately died of starvation, but also had emphysema caused by a rare congenital disease—the lack of an enzyme that protects the lungs. She probably was sickly and needed extra care all her brief life. The autopsy also found soot in her lungs from the family's sea mammal oil lamps, and she had osteoporosis, which was caused by a diet exclusively of meat from marine mammals. The girl's stomach was empty, but her intestinal tract contained dirt and animal fur. That remains a mystery and raises questions about the condition of the rest of the family. "It's not likely that she would be hungry and everyone else well fed," Jensen says.

That the girl appears to have been placed deliberately in the cellar provokes further questions about precontact burial practices, which the researchers hope Barrow elders can help answer. Historic accounts indicate the dead often were wrapped in skins and laid out on the tundra on wooden platforms, rather than buried in the frozen earth. But perhaps the entire family was starving and too weak to remove the dead girl from the house, Jensen speculates. "We probably won't ever be able to say, 'This is the way it was,'" she adds. "For that you need a time machine."

The scientific team reported to the elders that radiocarbon dating places the girl's death in about AD 1200. If correct—for dating is technically tricky in the Arctic—the date would set the girl's life about 100 years before her people formed settled whaling villages, Sheehan says.

Following the autopsy and the body's return to Barrow in August, one last request by the elders was honored. The little girl, wrapped in her feather parka, was placed in a casket and buried in a small Christian ceremony next to the grave of the other prehistoric bodies. Hundreds of years after her death, an Inupiat daughter was welcomed back into the midst of her community.

The "rescue" of the little girl's body from the raw forces of time and nature means researchers and the Inupiat people will continue to learn still more about the region's culture. Sheehan and Jensen returned to Barrow in winter 1994 to explain their findings to townspeople. "We expect to learn just as much from them," Sheehan said before the trip. Today, the Inupiat Heritage Center stores and displays artifacts from the dig sites.

Laboratory tests and analyses also contribute information. The archaeologists hope measurements of heavy metals in the girl's body will allow comparisons with modern-day pollution contaminating the sea mammals that Inupiats eat today. The soot damage in her lungs might offer health implications for Third World people who rely on oil lamps, dung fires, and charcoal for heat and light. Genetic tests could illuminate early population movements of Inupiats. The project also serves as a model for good relations between archaeologists and native people. "The larger overall message from this work is that scientists and communities don't have to be at odds," Sheehan says. "In fact, there are mutual interests that we all have. Scientists have obligations to communities. And when more scientists realize that, and when more communities hold scientists to those standards, then everybody will be happier."

Adapted from Simpson, S. (1995, April). Whispers from the ice. *Alaska*, 23–28. Reprinted by permission of the author.

Archaeological and Paleoanthropological Methods

Archaeologists and paleoanthropologists face a dilemma. The only way to thoroughly investigate our past is to excavate sites where biological and cultural remains are found. Unfortunately, excavation results in a site's destruction. Thus, anthropologists precisely record the location and context of everything recovered, no matter how small, as they excavate. Without these records, knowledge that can be derived from physical and cultural remains diminishes dramatically.

Lealisa Westerhoff/AFP/Getty Images

➤ **Figure 1.6 Lucy's Baby** In September 2006, researchers announced the discovery of a spectacular new fossil—the skeleton of a young child dated to 3.3 million years ago. The fossil was first discovered in the Dikka area of northern Ethiopia in 2000. Since then, researchers worked on careful recovery and analysis of the fossilized remains so that when the announcement was made in 2006, a great deal was already known about the specimen. Their analyses have determined that this child, a little girl about 3 years old who likely died in a flash flood, was a member of the same species as the famous Lucy specimen (see Chapter 4). Due to the importance of this find, scientists have referred to this child as "Lucy's baby" though the child lived about 150,000 years before Lucy.

Most of us are familiar with some kind of archaeological material: a coin dug out of the earth, a fragment of an ancient pot, a spear point used by some ancient hunter. Archaeology consists of far more than finding and cataloguing such **artifacts**, any object fashioned or altered by humans. Because they are something that someone made, archaeologists like to say that artifacts are products or representations of human behavior and beliefs, or, in more technical terms, artifacts are **material culture**. Archaeologists do not consider artifacts in isolation; instead, they integrate artifacts with **ecofacts**, the natural remains of plants and animals found in the archaeological record, as well as **features**, nonportable elements such as hearths and architectural elements such as walls. Archaeologists take into account how the artifacts and physical remains make their way into the ground. What people do with the things they have made, how they dispose of them, and how they lose them reflect important aspects of human culture. Together, biological and ecological remains provide a context that permits reconstruction of past lifeways in broad environmental contexts. By connecting series of sites through space and time, archaeologists and paleoanthropologists can focus on sweeping aspects of human experience ranging from settlement and migration patterns to the broad course of human evolutionary history.

Some of the oldest biological remains have survived through the process of fossilization. Broadly defined, a **fossil** is any trace or impression of an organism that has been preserved in the earth's crust from past geologic time. Fossilization typically involves the hard parts of an organism. Bones, teeth, shells, horns, and the woody tissues of plants fossilize most successfully. Although the soft parts of organisms rarely fossilize, the casts or impressions of footprints, brains, and even whole bodies have sometimes been found. Entirely preserved fossil skeletons dating from before the cultural practice of burial about 100,000 years ago are exceedingly rare (➤ **Figure 1.6**).

Because dead animals quickly attract meat-eating scavengers and bacteria that cause decomposition, they rarely survive long enough to become fossilized. For an organism to become a fossil, some protective substance must cover it soon after death. The materials surrounding the physical remains gradually harden, forming a protective shell around the skeleton of the organism. The internal

artifact Any object fashioned or altered by humans.

material culture The durable aspects of culture such as tools, buildings, and art objects.

ecofacts The natural remains of plants and animals found in the archaeological record.

features Nonportable archaeological elements such as architecture.

fossil The preserved remains of past life forms.

➤ **Figure 1.7 Underwater Archaeology** Here a diver recovers antique jugs used for transporting wine, olives, olive oil, grain, and other commodities from the underwater site of a shipwreck in the Mediterranean Sea near the village of Kas, Turkey. The shipwreck dates back to the time of the Trojan War (over 3,000 years ago). Underwater archaeologists—led in this expedition by George Bass from the Institute of Nautical Archaeology of Texas A&M University and collaborating with the Bodrum Museum of Underwater Archaeology in Istanbul, Turkey—can reconstruct facets of the past, ranging from ancient trade routes to shipbuilding techniques, through the analysis of such remains.

cavities of bones or teeth and other parts of the skeleton fill in with mineral deposits from the sediment immediately surrounding the specimen. Then the external walls of the bone decay and are replaced by calcium carbonate or silica.

Sites

Where are ancient remains found? Places containing remains of previous human activity are known as *sites*. There are many kinds of sites, and sometimes it is difficult to define their boundaries, for remains may be strewn over large areas. Sites are even found underwater (➤ **Figure 1.7**). Some examples of sites identified by archaeologists and paleoanthropologists are hunting campsites, from which hunters went out to hunt game; kill sites, in which game was killed and butchered; village sites, in which domestic activities took place; and cemeteries, in which the dead, and sometimes their belongings, were buried.

Archaeological and paleoanthropological investigations include locating and mapping sites. Many sites, particularly very old ones, frequently lie buried underground, covered by layers of sediment deposited since the site was in use. Most sites are revealed by the presence of artifacts. But as we go back in time, the association of skeletal and cultural remains becomes less likely. No cultural remains older than 2.6 million years have been discovered.

Although chance may play a crucial role in a site's discovery, survey techniques allow researchers to explore and map large geographic areas and to plot sites available for excavation. A survey can be made from the ground, but using remote sensing techniques is more common today. Archaeologists have used aerial photographs

to find sites since the 1920s. They are still widely used today along with a variety of innovations in the geographical and geological sciences such as geographic information systems (GIS) and ground-penetrating radar (GPR).

In open areas, sites are visible from the ground by mounds or **soil marks** or stains showing up on the surface of recently plowed fields. In forested regions, changes in vegetation provide evidence of a site. For example, the topsoil of ancient storage and refuse pits is often richer in organic matter than that of the surrounding areas, and so it grows distinctive vegetation. At Tikal, an ancient Maya site in Guatemala, breadnut trees usually grow near the remains of ancient houses, letting archaeologists use these trees to help guide their search.

Sometimes natural processes, such as soil erosion or droughts, expose sites. For example, in eastern North America and other areas where shellfish consumption was common, erosion along coastlines or riverbanks has exposed **middens**, prehistoric refuse mounds filled with shells. Various geologic processes have also played a key role in fossil discovery.

Excavation and Analysis

Once investigators identify a site likely to contribute to their research agenda, they plan out an excavation designed to meet research goals. To begin the excavation, the team clears the land and plots the area as a **grid system**, dividing the site surface into squares of equal size, and numbering and marking each square with stakes. This way, every object found can be located precisely in the square from which it came. Remember, context is everything!

Each grid system has a starting point, such as a large rock, the edge of a stone wall, or an iron rod sunk into the ground located precisely in three dimensions. This point is the reference or **datum point**. At large sites covering several square miles, the plotting may be done in terms of individual structures, numbered according to the squares that make up a giant grid. With great care, archaeological teams dig each square of the grid separately, using trowels to scrape the soil and screens to sift all the loose soils, to recover even the smallest artifacts such as flint chips or beads.

Successful excavation of fossils requires particular skills in the techniques of geology, or ready access to geologic expertise, because paleoanthropological interpretation of fossil records relies on placement of the specimen in the rock sequence. Only with surgical skill and great caution can fossils be removed from their burial place without damage. The paleoanthropologists' toolkit includes an unusual combination of instruments and materials—pickaxes, enamel coating, burlap for bandages, and sculpting plaster.

Excavation involves removing both the fossil and the earth immediately surrounding it, or the matrix, as a single block. In the laboratory, many more painstaking hours of work will separate the fossil from the surrounding matrix. Before leaving the discovery area, investigators make a thorough sketch map of the terrain and pinpoint the find on geologic maps to aid future investigators.

For both paleoanthropology and archaeology, at least three hours of laboratory work correspond to a single hour of excavation time. A wide variety of molecular and chemical testing techniques provide evidence about context and nature of the recovered remains. Establishing the date of remains is particularly vital for reconstructing the past.

Remains can be dated by noting their position in the earth, by measuring the amount of chemicals contained in fossil bones and artifacts, or through association with other plant, animal, or cultural remains. These methods, known as **relative dating** techniques, do not establish precise dates for remains. Instead, they establish the relationship among a series of remains by using geologic principles to place remains in chronological order. **Absolute dating** or **chronometric dating** (from the Latin for "measuring time") methods provide actual dates calculated in years "before the present" (BP). Relying upon advances in chemistry and physics, these methods use properties such as rates of decay of radioactive elements. The radioactive elements may be present in the remains themselves or in the surrounding soil. By comparing dates and remains across a variety of sites, anthropologists can scientifically establish actual dates for major events of geologic and evolutionary history such as human origins, migrations, and technological developments.

Of the many relative and absolute dating techniques, each has certain weaknesses. Ideally, archaeologists and paleoanthropologists try to utilize as many methods as appropriate, given the materials available and funds at their disposal. By doing so, they significantly reduce the risk of error. ▶ **TABLE 1.1** describes several of the most frequently employed dating techniques.

soil marks The stains that show up on the surface of recently plowed fields that reveal an archaeological site.

middens In archaeology, refuse or garbage disposal areas in prehistoric sites.

grid system A system for recording data from an archaeological excavation into three dimensions.

datum point The starting point or reference for a grid system.

relative dating In archaeology and paleoanthropology, designating an event, object, or fossil as being older or younger than another by noting the position in the earth, by measuring the amount of chemicals contained in fossil bones and artifacts, or through association with other plant, animal, or cultural remains.

absolute dating (chronometric dating) In archaeology and paleoanthropology, dating archaeological or fossil materials in units of absolute time using scientific properties such as rates of decay of radioactive elements.

TABLE 1.1 | Absolute and Relative Dating Methods Used by Archaeologists and Paleoanthropologists

Dating Method	Time Period	Process and Use	Drawbacks
Stratigraphy	Relative only	Based on the law of superposition, which states that lower layers or strata are older than higher strata; establishing the age of biological and cultural remains based on the layer in which they are found	Site specific; natural forces, such as earthquakes, and human activity, such as burials, disturb stratigraphic relationships
Fluorine analysis	Relative only	Comparing the amount of fluorine from surrounding soil absorbed by specimens after deposition; older remains will have absorbed more fluorine	Site specific
Faunal and floral series	Relative only	Sequencing remains into relative chronological order based on an evolutionary order established in another region with reliable absolute dates; called *palynology* when done with pollen grains	Dependent upon known relation-ships established elsewhere
Seriation	Relative only	Sequencing cultural remains into relative chronological order based on stylistic features	Dependent on known relationships established elsewhere
Dendrochronology	About 3,000 years before present (BP) maximum	Comparing tree growth rings preserved in a site with a tree of known age	Requires ancient trees of known age
Radiocarbon	Accurate <50,000 BP	Comparing the ratio of radioactive carbon 14 (^{14}C), with a half-life of 5,730 years, to stable carbon (^{12}C) in organic material; after organisms die, only the (^{14}C) decays (half of it every 5,730 years), so the ratio between (^{14}C) and (^{12}C) determines an actual date since death	Increasingly inaccurate when assessing remains from more than 50,000 years ago
Potassium argon (K-Ar)	>200,000 BP	Using volcanic ash, comparing the amount of radioactive potassium (40K), with a half-life of 1.25 billion years, to stable argon (^{40}Ar)	Requires volcanic ash; requires cross-checking due to contamination from atmospheric argon
Amino acid racemization	40,000–180,000 BP	Comparing the ratio of right- and left-sided proteins in a three-dimensional structure; decay after death causes these proteins to change	Variation in leaching of amino acids from soil causes error
Thermoluminescence	Possibly up to 200,000 BP	Measuring the amount of light given off due to radioactivity when the specimen is heated to high temperatures	Technique developed for recent materials such as Greek pottery; not clear how accurate the dates are for older remains
Electron spin resonance	Possibly to about 200,000 BP	Measuring the resonance of trapped electrons in a magnetic field	Works with tooth enamel, not yet developed for bone; problems with accuracy
Fission track	Wide range of times	Measuring the tracks left in crystals by uranium as it decays; good cross-check for K-Ar technique	Useful for dating crystals only
Paleomagnetic reversals	Wide range of times	Measuring the orientation of magnetic particles in stones and linking them to whether the earth's magnetic field pulled toward the north or south during their formation	Large periods of normal or reversed magnetic orientation require dating by some other method; some smaller events are known to interrupt the sequence
Uranium series	40,000 to 400,000 BP	Measuring the amount of uranium decaying in cave sites	Large error range

Ethnographic Methods

For archaeologists and paleoanthropologists, location of material and physical remains determines where fieldwork must take place. For ethnographers, the entire world is a potential field site. Research interests generally drive field site choice. Cultural anthropologists conduct **ethnographic fieldwork**—extended on-location research to gather detailed in-depth information on a society's customary ideas, values, and practices through participation in its collective social life.

Cultural anthropologists prepare for fieldwork by studying theoretical, historical, ethnographic, and any other literature relevant to the research problem to be investigated. They also study all that has previously been documented about the particular culture they wish to investigate. After delving into the existing literature, they may then formulate a theoretical framework and research question to guide them in their fieldwork. If possible, ethnographers make a preliminary trip to the field site before moving there for more extended research.

Because anthropologists must be able to communicate with the people they have chosen to study, they will also have to learn the people's language. Many of the 6,000 languages currently spoken in the world have already been recorded and written down, especially during the past hundred years or so. Anthropologists may learn several different languages prior to their fieldwork.

Today's globalized digital world has resulted in some new sites and methods for ethnographic analyses. Some ethnographers work in the virtual communities of cyberspace that crosscut ethnic and national boundaries. In cyberspace, common interests with their own practices and language connect people instead of ethnicity and inherited cultural traditions. For example, researchers could focus on video gaming through active participation in *World of Warcraft*, a game played by over 12 million people globally. By playing with and interviewing other gamers, researchers can tease apart questions such as how do individuals relate to their avatars. To conduct ethnographies of video gaming, anthropologists use many of the same methods as would be used in traditional field sites.

ethnographic fieldwork On-location participatory research to gather in-depth information on a society's customary ideas, values, and practices.

key consultants Members of the society being studied who provide information that helps the researchers understand the meaning of what they observe. Early anthropologists referred to such individuals as *informants*.

informal interview In ethnography, a research technique involving an unstructured, open-ended conversation in everyday life.

formal interview A structured question–answer session, carefully notated as it occurs and based on prepared questions.

eliciting devices Activities and objects used to draw out individuals and encourage them to recall and share information.

In the Field

When participating in an unfamiliar culture, anthropologists are often helped by one or more generous individuals in the village or neighborhood, or a family may take them in. Through participation in the daily routine of a household, they will soon become familiar with the community's basic shared cultural features (➤ **Figure 1.8**).

Anthropologists may also formally enlist the assistance of **key consultants**—members of the society being studied who provide information that helps researchers understand the meaning of what they observe. (Early anthropologists referred to such individuals as *informants*.) These insiders help researchers unravel the mysteries and behaviors of the field just as parents might guide their children. To compensate local individuals for their help in making the anthropologists feel welcome in the community and gain access to the treasure troves of inside information, fieldworkers may thank them for their time and expertise with goods, services, or cash.

Asking questions, the cornerstone of ethnographic fieldwork, takes place in **informal interviews**—unstructured, open-ended conversations in everyday life—and **formal interviews**—structured question/answer sessions carefully notated as they occur and based on prepared questions. Informal interviews may be carried out anytime and anywhere: on horseback, in a canoe, by a cooking fire, during ritual events, while walking through the community, and so on. Such casual exchanges are essential, for people often share most freely in these conversations. Moreover, questions put forth in formal interviews typically grow out of cultural knowledge and insights gained during informal ones.

Getting people to open up requires dropping all assumptions and cultivating the ability to ask questions and to *really* listen. Questions generally fall into one of two categories: broad, *open-ended questions*, such as, "Can you tell me about your childhood?" and *closed questions* seeking specific pieces of information, such as, "Where and when were you born?" Researchers also employ numerous **eliciting devices**—activities and objects used to draw out individuals and encourage them to recall and share information. For example, an ethnographic researcher may take and share photographs of cultural objects or activities and ask locals to explain what they see in the pictures.

Because many anthropologists still do fieldwork among traditional peoples in all corners of the earth, they may find themselves in distant places about which little detailed geographic knowledge exists. Therefore, ethnographers frequently construct maps of the area that

➤ **Figure 1.8** Anthropologists obtain information through long-term, full-immersion fieldwork based on participant observation. Here we see anthropologist Lucas Bessire enjoying the taste of *ajidabia* (a variety of wild honey) with Ayoreo Indian companions alongside a newly found beehive in the dry forest of the Gran Chaco in Paraguay, South America—one involved moment among many in the all-engaging challenge of anthropological fieldwork.

document the cultural meaning given to particular geographic features. Satellite geographic information systems (GIS) serve ethnographers as they do archaeologists and paleoanthropologists.

The Ethnography

After collecting ethnographic information, a researcher pieces together all that has been gathered into a coherent whole that accurately describes the culture. Traditionally, ethnographies are detailed written descriptions that document the culture under study in terms of a research question at hand. Ethnographers may focus on topics such as the circumstances and place of fieldwork itself; historical background; the community or group today; its natural environment, settlement patterns, subsistence practices, networks of kinship relations, and other forms of social organization; marriage and sexuality; economic exchanges; political institutions; myths, sacred beliefs, and ceremonies; and current developments. These may be illustrated with photographs and accompanied by maps, kinship diagrams, and figures showing social and political organization, settlement layout, floor plans of dwellings, seasonal cycles, and so on.

Sometimes ethnographic research is documented with sound recordings, on film or digital media. Visual records may be used not only for documentation and illustration, but also for analysis or as a means of gathering additional information in interviews. Moreover, motion picture or video footage shot for the sake of documentation and research may also be edited into a documentary film or digital ethnography, which provides an accurate visual representation of the ethnographic subject (Collier & Collier, 1989; el Guindi, 2004).

Anthropology's Comparative Method

The end product of any anthropological research, if properly carried out, is a coherent statement that provides an explanatory framework for understanding the beliefs, behavior, or biology of the people studied. This, in turn,