PHYSICAL ANTHROPOLOGY
THE CORE

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TO OUR FAMILIES

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PREFACE

This volume is titled *Physical Anthropology: The Core.* What does this mean? In our larger text, *Physical Anthropology,* now in its fifth edition, we attempt to cover the major topics that are encompassed in the discipline of physical anthropology. This is a difficult job, for physical anthropology includes a tremendous breadth of subject matter.

In 1992 the members of the American Association of Physical Anthropologists were surveyed as to their teaching and research specializations.[1] The list of significant interests is formidable and includes anatomy, cytogenetics, demography, dermatoglyphics, epidemiology, evolutionary theory, forensic anthropology, growth and development, health and nutrition, human adaptation, human genetics, human variation, kinesiology, molecular evolution, molecular genetics, osteology, paleoanthropology, paleopathology, population genetics, population biology, primate anatomy, primate behavior, primate ecology, primate evolution, sociobiology, and many others.

The principal challenge is, of course, to define those topics that make up the "core" of physical anthropology, the term "core" referring to the nucleus, the crux, the essence, the heart, of physical anthropology. We have decided to be pragmatic about the problem and select our topics in answer to the question: What are the primary topics that are most often taught in an introductory physical anthropology course, especially a course that is being offered as part of a liberal arts education? The results of such an evaluation can be seen by reading the Table of Contents.

[1]C. W. Wienker and K. A. Bennett, "Trends and Developments in Physical Anthropology, 1990–91," *American Journal of Physical Anthropology,* 87 (1992), 383–393.

Like our larger text, this core version continues to emphasize three themes. First, anthropology is a holistic disipline; physical anthropology cannot be totally separated from the general discipline of anthropology. Second, human beings, the focus of physical anthropology, are an integral part of nature. Our survival, like that of other living organisms, depends upon maintaining a balance with supporting environments. Third, since humans depend on learned behavior, our maintenance of a balance with nature can be strengthened by an understanding of our evolutionary past as well as the development of insights into the possible consequences of our behavior on our future evolution.

Physical Anthropology: The Core is significantly shorter than a full-length text. This makes the book useful in courses shorter than the traditional semester-long course and useful in courses that introduce more than one field of anthropology, such as physical anthropology/archaeology, where two short texts can be used. We also hope that the shorter length and lower price makes the book more reasonable to use with study guides, readers, workbooks, and so forth.

This text also incorporates a number of pedagogical devices that have emerged from over a combined 65 years of teaching and 40 years of writing texts. Each chapter is divided by headings into managable segments and the three levels of headings can assist the student in outlining the material. A summary is found at the end of each major heading. All technical terms are bolded when they are first used, and their definitions can be found in the Glossary. Suggested Readings and Study Questions are found at the end of each chapter. The Appendix provides an illustrated introduction to skeletal

anatomy which can be used in association with several different chapters.

Based upon our teaching experience with lower division general education students we have tried to avoid complex technical explanations and to write in a clear, concise, and jargon-free manner at a level appropriate for this college population. The large number of figures and tables are designed to aid in explaining important concepts. Finally, the information contained in boxes are designed to provide students with interesting stories, information, and quotations to further expand on the topics discussed in the chapter.

This text is also accompanied by two supplements, one for the instructor and one for the student. The *Instructor's Manual Test File* provides the instructor with over 1000 exam questions, also available is exam-writing software, laboratory exercises, lists of films, videos, software, along with suppliers, plus sources of supplies and equipment. For the student we have written a *Study Guide* to assist in the development of a mastery of the text material.

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Finally, special appreciation goes to our families and wives, Carol Stein and Christine L. Rowe, for their encouragement and help.

Philip L. Stein
Bruce M. Rowe

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IN BRIEF

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PROLOGUE

What is it to be human? This question has been satisfactorily answered for some, has puzzled others, and has tormented many. Plato defined people as "bipeds[1] without feathers," an amusing image but also an early attempt at classifying people as animals. Mark Twain observed, "Man is the only animal that blushes—or needs to." He recognized the human social consciousness, the ability to be embarrassed. An anonymous author wrote, "Man is the only animal that eats when he is not hungry, drinks when he is not thirsty, and makes love at all seasons."

Physical anthropology is concerned with several fundamental questions, including: What is it to be human, what is the relationship of humans to the rest of the animal kingdom, how did humans evolve, and what is the nature of humankind? The attempt to solve these puzzles throws light on the even more intriguing question: What am I?

THE NATURE OF HUMANKIND

The children of the San society of South Africa are completely dependent upon their families for food. While they are very young, their mothers' milk is their primary source of nourishment. Later their fathers, uncles, and brothers will supply them with meat; their mothers, aunts, and sisters will supply them with wild plant foods. Not until the children are 14, perhaps much older, will they contribute to the group's subsistence.

Until they marry, children live in the camps of their parents, learning the rules by which they must live. In order to survive, they must listen well to the elders, who have experienced nature with its rewards and punishments.

The children grow and develop. They learn that it is the responsibility of the males to provide the camp with meat, and young boys develop hunting skill by playing games as well as by watching and listening to their fathers and uncles. The boys learn that it will be their responsibility as adults to protect their groups from the wrongdoings of other groups. The children observe that females are the gatherers. Collecting roots, nuts, berries, stems, and leaves for the day's meal, the women supply the camp with the majority of its food.

Human life depends on technology. A San individual stripped of clothes, shelter, tools, and weapons has no chance in his or her world; it is a place where biological equipment alone is not sufficient for survival. Although humans do have inborn physical and behavioral adaptations, humans substitute spears for physical power, fire for fur; they use technological achievements to adjust to different environmental conditions.

Nevertheless, survival is only a part-time task. Humans take time to ponder the nature of the universe or their own nature. They paint pictures and dedicate them to their sacred spir-

[1]A biped is an animal that walks upright on two legs.

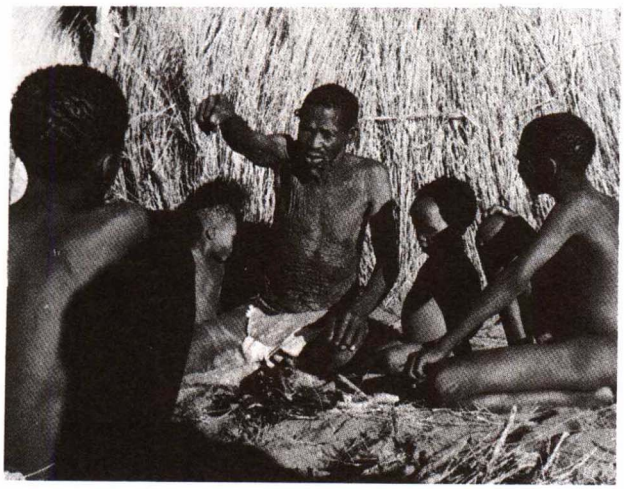

FIGURE P–1 *San family.* Human survival depends on the prolonged protection and tutelage of offspring. Family ties can last a lifetime.

its. Thoughts of awe, understanding, fear, and contentment occupy their minds, and their ideas are transmittable. Thoughts, through language, enter the minds of others, and there they incubate to new heights of development.

The lives of nonhuman animals are controlled primarily by genes. Nevertheless, many animals have been extremely successful in their adaptations to a variety of habitats. Humans, on the other hand, are primarily dependent on learned behavior. In fact, the emergence of the human species and its continuance are dependent upon what is called **culture.**

Culture: A Central Theme of Anthropology

Culture is one of those words that everyone uses but almost everyone uses differently. A person may say, "Those people belong to the Art Society; they certainly are cultured." To the anthropologist there is one thing culture is not, and that is a level of sophistication or formal education. Culture is not something that one person has and another does not.

Anthropologists have defined culture in hundreds of ways. Fortunately, most definitions have points in common, and these points are included in our definition. Culture is learned, nonrandom, systematic behavior and knowledge that is transmitted from person to person and from generation to generation. Culture changes through time and is a main contributor to human adaptability.

Culture is learned; it is not biologically determined, coded by the hereditary material. When termites emerge from their pupae, workers, soldiers, and queens crawl away to their respective predetermined tasks. They are innately equipped to brave the hazards of their environment. Humans do not function in this manner. A baby abandoned at birth has *no* chance of surviving by itself. In fact, most 6- or 7-year-olds would probably perish if left to their own resources. Survival strategies, and other behaviors and thoughts, are learned from people such as parents, other relatives, teachers, peers, and friends.

Culture is patterned in two ways. First, culture is nonrandom behavior and knowledge; that is, specific actions or thoughts are usually the same in similar situations. For example, in Western societies when two people meet, they usually shake hands. A specific behavior pattern, such as shaking hands, in a particular situation, such as two people meeting, is called a **norm.** A norm is the most frequent behavior that the members of a group will show in a given situation.

Second, culture is patterned in the sense that it is systematic; that is, one aspect of behavior or thought is related to all others. Taken together, they form a **system.** A system is a collection of parts that are interrelated so that a change in any one part brings about specifiable changes in the others. In eastern Europe, for example, the change from a communistic government to a more democratic one has had repercussions on educational, economic, moral, and social elements of society. In addition, a group's cultural traditions and the way in which its members relate to each other reflect certain underlying principles about the basic characteristics of people and nature.

Culture is transmittable; it spreads. Information is learned, stored in the cortex of the brain, interpreted, and then transmitted to other people. Knowledge builds on information from past generations. In societies with writing, each generation can continue to influence future generations indefinitely. A particular culture is the

result, therefore, of its history as well as its present state. Although there is now evidence that certain nonhuman animals also possess some ability to pass on acquired behavior, in none of these has this ability evolved to the same degree as in humans.

Over time nonhuman animals usually adapt to changing environments through changes in their physical form. Humans usually adjust to a change in environment with changes in behavior or knowledge (including beliefs, values, and customs).

Of course, physical changes have been important in human evolution, and they account for why we no longer look like our distant ancestors. The size and proportions of the human body and the size and structure of the brain have changed over time. These changes have led to the freeing of the arms and hands from locomotor functions and the evolution of a brain capable of mental functioning at a higher level than other animals.

Such changes allow for today's cultural potential. Humans can sometimes substitute cultural innovation for biological alteration. If you were to transplant a group of temperate-zone nonhuman animals to an arctic environment, they might all die. On the other hand, those who were somewhat different from the average, possibly by having more fur, might survive. If you put people into the same environment, however, they might make systematic changes in their culture that lead to appropriate technological and social innovations. They might build an igloo, start a fire, or even kill a polar bear to make a coat.

The human biological potential for culture allows people to adjust to environments through culture as well as biology. This is one reason why the human species is so widely dispersed. Physical features do not need to change in order for humans to move into a new environment. Instead, human biological potentials allow for behavioral flexibility that results in an enormous range of adjustments.

To What Degree Is Human Behavior Biologically Determined?

There is no debate that the human *potential* for learned behavior is inherited. Walt Disney aside, you cannot teach a mouse to be a person: a mouse possesses a mouse nature, a cat has a cat nature, and a cow has a cow nature. Likewise, humans possess a biologically determined human nature. This does not mean that humans, mice, cats, and cows are unrelated; there is biological continuity between humans and the rest of the animal kingdom. Through the process of evolution, we share an ancestry with all living things.

Most scientists would agree with the above statements. However, there is still a great deal of debate over the inheritance of specific behaviors. Researchers question why all societies have some system of marriage, prohibit sexual relationships between certain categories of individuals (mother and son, for instance), divide labor on the basis of age and sex, decorate their faces, and so on. Is it because of biological destiny? Or is biology not involved? On an even more specific level, do people differ from each other in terms of aggression, shyness, sexual preference, group loyalty, manic-depressive behavior, altruism, and other individual traits because of inheritance?

Some investigators, called **sociobiologists,** see a biological basis for both human universals and many individual behaviors. They hypothesize that behaviors, like physical characteristics, evolve through natural selection, a process that increases the proportion of individuals with beneficial adaptations.

Many anthropologists are not convinced of a biological basis either for behaviors found in all cultures or for more specific types of behavior. They say that human universals can be explained by practical, social, and economic forces. For instance, mother-son incest would be socially disruptive to the family unit, irrespective of the society in which it occurred. This type of mother-son relationship would displace the role of the husband-father.

Billy cannot sit still in class like Maria does. Many anthropologists and sociologists attribute individual differences in personality mainly to differences in agents of socialization and environment. They would believe that the differences in Billy's and Maria's behavior are simply the result of having different parents, friends, teachers, and other social factors such as birth order or exposure to television, as well as the socioeconomic environment.