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A View from the Herd

Cattle, Sheep, Goats, and Pigs in Pharaonic Egypt

A Primer for Egyptologists and Archaeologists

by Richard W. Redding

LOCKWOOD PRESS

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Dr. Richard W. Redding (right) teaching two Ministry of Antiquities and Tourism inspectors, Mohamed Hussein Ahmed (far left) and Mohamed Raouf Badran (center), zooarchaeology techniques during the AERA-ARCE field school. Their work with Richard inspired them to write an article in 2018 for the AERA newsletter. Photograph by Mark Lehner. Copyright AERA 2023.

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FOREWORD: A NOTE FROM THE EDITORS

Dr. Richard Redding submitted this manuscript to Lockwood Press in May 2023, just a few days before his sudden and untimely death. We were eager to work with him, as both of us had read many of his works and separately conversed with him at professional conferences. While working on the manuscript, Richard shared and discussed ideas in it with Dr. Salima Ikram. After Richard passed away, we asked Salima to peer review the manuscript, to which she eagerly agreed and suggested that we obtain further help from Dr. Louise Bertini. This book, therefore, contains several additions and clarifications made by Salima, who also shared the chronological table for ancient Egypt. Louise provided important clarifications for Richard's work on pigs. The editors provided academic editing, ironed out manuscript issues with help from those mentioned here, and redid several figures and tables. In helping see the manuscript through to its final form, we are indebted to the American Egypt Research Associates (AERA) organization and its staff, first and foremost AERA's arts and sciences editor, Dr. Wilma Wetterstrom, who provided many figures, obtained museum images, AERA permissions, and imparted much-needed information. Thanks also to AERA GIS director Rebekah Miracle for providing additional figures, AERA's director of archaeological science, Dr. Claire Malleson, and AERA's president, Dr. Mark Lehner. We also thank the University of Michigan's Kelsey Museum artist Lorene Sterner for artwork and depiction discussions, and Susanne Wilhelm, for her gratis reworking of the cover image.

Richard meant this book as synthesis of his longtime work in Egypt. As such, it was his dream to have it published in time for a launch at the 2024 Eighty-ninth Annual Meeting of the Society for American Archaeology in New Orleans, Louisiana. Richard's wife, Cheri Alexander, and their daughter, Dr. Alexis Redding, were able to temporarily put aside their deep grief whenever we needed them, whether that was to help locate figures on Richard's computer, answer questions about his publication wishes, or myriad other matters with which we had to burden them. They wanted, above all else, to fulfill Richard's wish by doing whatever they could to have his magnum opus published according to his original vision. We hope that we have achieved that goal.

PREFACE AND ACKNOWLEDGMENTS

As a young undergraduate student, I went to Iran in August of 1970 to work on Henry Wright's survey and excavation project on the Susiana Plain. My role was more than an archaeozoologist. I had been trained in vertebrate paleontology and archaeozoology, but my real interests were in evolutionary ecology and using ecological modeling to understand human behavior. In my undergraduate studies, I had been influenced by Robert MacArthur's *The Theory of Island Biogeography* (1967). Later, I encountered Eric Pianka's *Evolutionary Ecology* (1974). In Iran, as part of my interest in evolutionary ecology, I spent time collecting specimens for the collections of the Museum of Zoology at the University of Michigan and studying small mammal ecology. I received a great deal of guidance and support in this stage of my career from Douglas Lay, who wrote the *Mammals of Iran* (1967). While collecting, I spent time with nomadic groups in southwestern Iran and began to think about pastoralism as an adaptation and how pastoralists, both nomadic, sedentary, and agropastoralists, functioned in the economy and how they made decisions. The nomads I spoke with, the Lur and the Bakhtiari, were a great source of information about their animals and I was enthralled with how much knowledge they had about the characteristics, potential, and limits, of their cattle, sheep, and goats. I was introduced to the world of the nomads by Frank Hole and Henry Wright.

I spent four seasons in Iran doing research on the animals of the Susiana Plain in Khuzestan, Iran and observing the pastoralists. My original dissertation topic was a study of the potential of using rodents as environmental indicators of the intensity of irrigation agriculture. I had found that Sundevall's jird, *Meriones crassus*, was associated with dry farming, while the Indian Gerbil, *Tatera indica*, was associated with irrigation agriculture. Further, the size of male *T. indica* specimens varied with the intensity of irrigation. The more days of irrigation in a field the larger the male specimens. This work came to a screeching halt in early 1979 when Shah Mohammed Reza left Iran. I was left with no dissertation.

In a search for a new dissertation topic, I decided to explore the differences between sheep and goats in behavior, ecology, physiology, production, and reproduction to develop models, based on the animals, of how pastoralist might have structured and used their flocks. How might the tactics and strategies employed by herders change given different goals? How might tactics and strategies change given shifts in economies and environment? I found a wealth of information from three sources. The first was the ethnographic literature, which was frustratingly variable. Some researchers provided good information on the flocks of their study area, others none. It was difficult to find comparable data. The second source was the literature on the wild ancestors, which was very detailed for sheep and less so for goats. One problem I recognized was that I had to use these data carefully, as the studies were on small, remnant populations that were frequently on preserves. The third source of data was from the animal science literature. Huge numbers of studies on cattle, sheep, and goats had been done in the Middle East, some dating to the 1930s, on the characteristics of these animals. There were two problems with these data sources. First, some studies were on animals that were improved breeds, imported to the area, or on animals that had been improved by cross breeding. What I focused on were studies on local, unimproved breeds that were the descendants of populations that had existed in the area for thousands of years. The second problem with the studies is that many of the animals, even the unimproved local breeds, were increasingly being given modern veterinary care and fed supplements that would not have been available in the past. The care and use of supplements certainly affects the rates of breeding, survivability, and productivity of even the unimproved local breeds.

My dissertation (Redding 1981) on modeling human decision-making for herds, focused on only sheep and goats to make the study manageable. I had put cattle aside but still collected articles with data on cattle in the Middle East intending to add them to the study in my later work.

The Iranian Revolution also necessitated a shift in my geographic area of interest. In 1981, Robert Wenke asked me to work in the Fayyum of Egypt

on the origins of agriculture. This was a survey project, with surface collection and limited excavation. I still found time to interview local herders about their animals and the potential and limits of their flocks. In 1984, Wenke and I opened excavations at the Old Kingdom site of Kom el-Hisn, located in the Nile Delta (Wenke, Redding, and Cagle 2016). This was explicitly a study of rural settlements in the Old Kingdom. My studies on the fauna suggested it was a production site with the young male cattle, sheep, and goats removed for consumption at provisioned sites (Redding 1992, 2014, 2016). Based on my work at Kom el-Hisn, Mark Lehner asked me to join his project at Giza, excavating what has become known as the Workers' Town, or the Heit el-Ghurab (HeG). My first season with Lehner was 1989 and I have worked at Giza every year since 1995. Here was an opportunity to test my predictions about the faunal patterns of a provisioned site. As a result of my work at the HeG, I began to try to estimate human meat requirements and yields from cattle, sheep, and goats. I tried to answer questions such as: How many cattle, sheep, and goats were consumed each day? How big were the herds required to supply that number of animals? How much land was needed to raise the herds. And how many herders were needed? I was trying to reconstruct the animal economy of the Old Kingdom.

The present book is the result of this intellectual journey. I originally meant to write this book shortly after my dissertation, but it was fortunate I waited. The book would have been a model of the potential of cattle, sheep, and goats and the strategies and tactics humans may have employed, but it would have missed all the information on productivity and yields and how these related to economic activities. Neither the chapter "Butchering, Nutrition, and Patterns of Consumption" nor the final chapter highlighting archaeological examples would have existed.

I owe thanks to many who have intellectually supported and encouraged my research over the years. These include Henry Wright, Douglas Lay, Phil Myers, Robert Wenke, Sharon Herbert, Frank Hole, and Mark Lehner. I have had a host of colleagues that encouraged me, provided feedback and ideas, and challenged me. These include John Speth, Mindy Zeder, Kate Moore, Karen Mudar, Michael Rosenberg, Wilma Wetterstrom, Salima Ikram, Wim Van Neer, and Claire Malleson. I thank Lorene Sterner, Wilma Wetterstrom, and Rebekah Miracle for preparing figures, maps, and for helping with the photographs.

The Ancient Egypt Research Associates (AERA) team has been instrumental in providing me with faunal material and ideas. First among them is the founder, Mark Lehner, but the list must include all the excavators and specialists. I thank Mohsen Kamel the director AERA-Egypt, a friend and colleague. I thank all the donors who contributed to support AERA's work over the years: Ann Lurie, David Koch, Nathan Myhrvold, Dr. Walter Gilbert, Lee and Ramona Bass, Glen Dash and/or The Glen R. Dash Charitable Foundation, Kathy DeRue, William Frank, Ed and Kathy Fries, Janice Jerde, Bruce Ludwig, Cameron and Linda Myhrvold, Peter Norton and/or The Isambard Kingdom Brunel Society of North America, Ted Waitt, Doug Rawles, and Reed Smith.

I also thank Cheri Alexander and Alexis Redding, who have supported me and put up with my long absences over the years.

ABBREVIATIONS

African Humid period (AHP)
Ancient Egypt Research Associates (AERA)
animal unit (AU)
biological value (BV)
cervico-thoracic hump (C-T)
complex adaptive system (CAS)
Complexity theory (CT)
dry sheep equivalent (DSE)
Eastern Town (ET)
Eastern Town House (ETH)
edible product (EP)
Gesher Benot Yaʿaqov (GBY)
Heit el-Ghurab (HeG)
Holocene Pluvial (HP)
intertropical convergence zone (ITCZ)
Kromer (KRO)
Menkaure Valley Temple (MVT)
minimum number of individuals (MNI)
North Street Gate House (NSGH)
northwest coastal zone (NWCZ)
number of identified specimens (NISP)
Pottery Mound (PM)
principal components (PC)
Royal Administrative Building (RAB)
Silo Building Complex (SBC)
thoracic hump (T)
Western Town (WT)

CHRONOLOGICAL OUTLINE OF ANCIENT EGYPT

Note: As dates of pharaohs' reigns are disputed, only the approximate dates for the dynasties are provided. The dates of pharaohs' reigns in the text are noted where their names appear in the book.

Early Dynastic Period	
Dynasty 1	3050–2800 BC
Dynasty 2	2800–2660
Old Kingdom	
Dynasty 3	2660–2600
Dynasty 4	2600–2470
Dynasty 5	2470–2360
Dynasty 6	2360–2200
First Intermediate Period	
Dynasties 7/8	2200–2100
Dynasties 9/10 (Lower Egypt)	2100–2000
Dynasty 11a (Upper Egypt)	2080–2010
Middle Kingdom	
Dynasty 11b	2010–1943
Dynasty 12	1943–1760
Dynasty 13	1765–1650
Second Intermediate Period	
Dynasty 14 (Lower Egypt)	1700–1650
Dynasty 15 (Lower Egypt)	1650–1525
Dynasty 16 (Upper Egypt)	1660–1585
Dynasty 17 (Upper Egypt)	1585–1530
New Kingdom	
Dynasty 18	1530–1278
Dynasty 19	1278–1176
Dynasty 20	1176–1078
Third Intermediate Period	
Dynasty 21	1078–941
Dynasty 22	943–666
Dynasty 23 (Thebes)	834–755
Dynasty 23 (Herakleopolis)	730
Dynasty 23 (Hermopolis)	730
Dynasty 23 (Leontopolis)	730
Dynasty 24 (Lower Egypt)	728–712
Dynasty 25	755–656
Saite Period	
Dynasty 26 (Lower Egypt)	672–664
Late Period	
Dynasty 27 (Persians)	525–404
Dynasty 28	404–398
Dynasty 29	398–379
Dynasty 30	379–340
Dynasty 31 (Persians)	340–332
Hellenistic Period	
Dynasty of Macedonia	332–310
Dynasty of Ptolemy	310–30
Roman Period	30 BC–AD 395
Byzantine Period	395—640
Arab Period	640–1517
Ottoman Period	1517–1805