Archaeobiology 2

The Wide Lens in Archaeology

Honoring Brian Hesse's Contributions to Anthropological Archaeology

edited by Justin Lev-Tov, Paula Hesse, and Allan Gilbert



THE WIDE LENS IN ARCHAEOLOGY

HONORING BRIAN HESSE'S CONTRIBUTIONS TO ANTHROPOLOGICAL ARCHAEOLOGY

\$\mathcal{U} LOCKWOOD PRESS

Archaeobiology

Sarah Whitcher Kansa, editor

Number 2 The Wide Lens in Archaeology: Honoring Brian Hesse's Contributions to Anthropological Archaeology

THE WIDE LENS IN ARCHAEOLOGY

HONORING BRIAN HESSE'S CONTRIBUTIONS TO ANTHROPOLOGICAL ARCHAEOLOGY

edited by

Justin Lev-Tov Paula Hesse Allan Gilbert

THE WIDE LENS IN ARCHAEOLOGY

HONORING BRIAN HESSE'S CONTRIBUTIONS TO ANTHROPOLOGICAL ARCHAEOLOGY

Copyright © 2017 by Lockwood Press

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by means of any information storage or retrieval system, except as may be expressly permitted by the 1976 Copyright Act or in writing from the publisher. Requests for permission should be addressed in writing to Lockwood Press, PO Box 133289, Atlanta, GA 30333 USA.

Library of Congress Control Number: 2017952617

ISBN: 978-1-937040-95-6

Cover design by Susanne Wilhelm.

Contents

Inti	roduction: Bones as Building Blocks for Brian Hesse's Social		
	Archaeology	ix	
Bria	an Hesse (z"l) 1944–2011: Curriculum vitae	XV	
Abł	Abbreviations		
	Part 1: Contexts, Collections, and the Archaeo(zoo)logical Record		
1	JEFFREY A. BLAKELY AND INBAR KTALAV Identifying and Understanding Residuality in Tell el-Ḥesi's Archaeological Record: The Malacological Evidence	3	
2	Thomas H. McGovern, George Hambrecht, Seth Brewington, Frank Feeley, Ramona Harrison, Megan Hicks, Konrad Smiarowski, and James Woollett Too Many Bones: Data Management and the NABONE Experience	29	
3	HASKEL J. GREENFIELD AND ANGELA BEATTIE A Practical Macroscopic Approach for Distinguishing Burned and Boiled Bones in Zooarchaeological Assemblages	43	
	Part 2: Peoples, Pigs, and Pots in Palestine		
4	Liora Kolska Horwitz, Armelle Gardeisen, Aren Maeir, and Louise A. Hithcock A Contribution to the Iron Age Philistine Pig Debate	93	
5	EDWARD F. MAHER Flair of the Dog: The Philistine Consumption of Canines	117	
6	Yosef Garfinkel The Ethnic Identification of Khirbet Qeiyafa: Why It Matters	149	
7	Avraham Faust An All-Israelite Identity: Historical Reality or Biblical Myth?	169	

vi Contents

Part 3: Ritual R	eal Estate
------------------	------------

8	JONATHAN S. GREER "Cursed Be the Cheat Who Offers a Blemished Animal!" A Broken Tibia from a Sacrificial Deposit at Tel Dan and Its Implications for Understanding Israelite Religious Practice	193
9	JUSTIN LEV-TOV Can Bones Differentiate Royal Roast from Sacrificial Slaughter? The Case of Hazor's Late Bronze Age Monumental Building	203
10	DEIRDRE N. FULTON, PAULA HESSE, AND BRIAN HESSE Considering Carcasses: Sheep and Goat Sacrifice at Carthage, Tunisia, and Al Qisha, Yemen	245
	Part 4: Buried Beasts	
11	LIDAR SAPIR-HEN, YUVAL GADOT, AND ODED LIPSCHITS Ceremonial Donkey Burial, Social Status, and Settlement Hierarchy in the Early Bronze III: The Case of Tel Azekah	259
12	LIORA KOLSKA HORWITZ, DANIEL M. MASTER, AND HADAS MOTRO A Middle Bronze Age Equid from Ashkelon: A Case of Ritual Interment or Refuse Disposal?	271
13	LIORA KOLSKA HORWITZ, SAMUEL R. WOLFF, AND STEVEN ORTIZ The Context and Biometry of Iron Age II and Hellenistic Period Dog "Burials" from Tel Gezer Compared to Those from Other Sites in the Region	297
	Part 5: Organization and Orientation of Animal Economies	
14	AHARON SASSON Cattle Husbandry and the Survival Subsistence Strategy: A Zooarchaeological Perspective	337
15	Pam Crabtree and Douglas V. Campana Where Are Our Goats? The Role of Goats in Anglo-Saxon England	365
16	BILL GRANTHAM, DANIEL LOWREY, HILLARY BOYD, AND SAMANTHA EARNEST Cally Cally Cally during the Roman and Privantine Pariods in Jarcel	277
	Gallus Gallus during the Roman and Byzantine Periods in Israel	377

Contents vii

	Part 6: Animal Use at Three Sites through the Ages	
17	DAVID R. LIPOVITCH A Preliminary Analysis on the Iron Age III Faunal Remains Tell Ta´yinat, Turkey (Ancient Kunulua)	395
18	Tina Greenfield, Chris McKinny, and Itzhaq Shai "I Can Count All My Bones": A Preliminary Report of the Late Bronze Faunal Remains from Area B1 at Tel Burna, Israel	419
19	Justin Lev-Tov, Sarah W. Kansa, Levent Atici, and Jane C. Wheeler New Light on Faunal Remains from Chogha Mish, Iran	443
Ind	lexes	477



Brian Hesse at the University of Hawaii in 2010

Introduction: Bones as Building Blocks for Brian Hesse's Social Archaeology

JUSTIN LEV-TOV

Brian Hesse started out his professional career with a strong interest in animal bones, finishing his PhD at Columbia University by writing a still widely cited dissertation on the domestication of goats in western Iran, based on his research on faunal remains from Tepe Ganj Dareh (Hesse 1978). In fact, Brian many years later returned to that subject, revisiting the same dataset and coauthoring a paper on it with Melinda Zeder (Zeder and Hesse 2000). In the process, Brian's original conclusions were confirmed: the goats from the site were early domesticates based on the assemblage's demographic profile, even though they were not morphologically distinguishable from wild goats at that point in the Neolithic. One of Brian's last projects was another return to the Neolithic, a study of the bones from the pottery Neolithic site of Shaʿar Hagolan, Israel (Hesse 2002), in which he focused on the site's late Neolithic date (sixth millennium BCE) and its implications for understanding animal husbandry after the so-called Neolithic Revolution but prior to the Urban Revolution.

Hesse, though maintaining a focus on the Fertile Crescent (Hesse 1982, 1984) after finishing his PhD, was always somewhat eclectic, especially in the first several years of his career. Like other American archaeologists of his generation, he had to end his research in Iran at the time of the 1979 revolution. That perhaps led him to his work during the early 1980s in South America, where he studied camelids, Muscovy ducks, and other animals in Chile, Ecuador, and Brazil. His South American interlude did not last, and while working at the Smithsonian Institution in the 1980s, Hesse collaborated with a colleague there on prehistoric sites in the North American plains as well as historic period sites near Washington, DC. The southeastern U.S. state of Alabama became an area of research for Brian after he took up a long-held position at the University of Alabama, Birmingham. There he worked on faunal assemblages from North American prehistoric contexts and had the opportunity to train graduate students in zooarchaeology, utilizing both local and Near Eastern assemblages.

Brian very evidently never lost his interest in the animal bones of the Middle East, and, since Iran had become off-limits, switched to working in other coun-

x Lev-Tov

tries within the region, at first seemingly trying out research in Yemen, Tunisia, and Jordan prior to settling on Israel as a place within which to focus his research. Although the domestication of animals in the Middle East remained an interest of his, he turned his main attention more and more to faunal remains from the Near East dating to post-Neolithic periods. The shift to later periods began his intense interest in integrating animal bones into the mainstream of Near Eastern archaeology by attempting to show that the material could help answer important questions about Bronze and Iron Age societies. Up to the time of Brian's entry into the zooarchaeology of the Bronze and Iron Ages in the Levant, as well as more recent periods, there had been much doubt among excavation directors there that animal bones could be useful in helping reconstruct those ancient societies (cf. LaBianca 1995, 4). As Halpern and Greer (2011) wrote, "Before Hesse, bones were never properly sampled, but after his work ... excavators in Israel, and a good many in Syria and elsewhere, have placed a new emphasis on the collection of faunal remains." In a way, however, Brian's foray into dietary studies within complex societies was a return to earlier themes: as a graduate student, Brian published a paper in Columbia's Near Eastern studies journal (Hesse 1971) which attempted to show how bones could be useful in the reconstruction of ancient states. Indeed, though never published, one of Brian's earliest researches in the post-Neolithic Mediterranean world was his participation in Lawrence Stager's excavations in Carthage on behalf of Harvard University, a relationship that led Stager to invite Brian to study the animal bones from Harvard's subsequent excavations in Ashkelon, Israel.

Later, with his wife Paula Wapnish Hesse, in a widely cited article published for a large audience in the popular magazine Biblical Archaeologist [now called Near Eastern Archaeology] (1993), the need for insights from zooarchaeology to be integrated into site interpretations and not relegated to little-read appendices was again addressed. This article dealt with the curious phenomenon of dog burials from Ashkelon's Persian era. His papers in the 1980s on post-Neolithic animal bones in the Near East, many coauthored with Paula, would for many scholars form his most recognizable body of work. It was within this period that Brian began his lasting affiliations with several projects in Israel, including Ashkelon, Tel Dan, and Tel Miqne-Ekron. Seemingly, during analysis and interpretation of faunal remains from those projects, Brian developed what was arguably new, or at least unusual, in both Near Eastern archaeology and even zooarchaeology: the employment of complex social arguments to explain patterning in animal bone collections (see Fowles 2008). In an obituary for Hesse, Shanks (2011), the publisher of the popular magazine Biblical Archaeology Review, noted that work on the dog cemetery had made the resultant article about the phenomenon one of the most widely read in the magazine he edits, Biblical Archaeology Review (see Stager 1991).

Before, in between, and after, Brian published a number of articles on ethnicity and diet. His views on pig bones in the Near East comprise another influential corpus of scholarship, not only for fellow scholars in the community of faunal analysts, but also for archaeologists whose specialty is pottery. Pots and people arguments are old in archaeology, and Brian gave archaeologists something new to chew on: pigs and people. With the start of Hesse's work at Tel Migne-Ekron (Hesse 1986), archaeologists who had long speculated that the Philistines came from elsewhere in the Mediterranean to settle in the southern Levant now had what they perceived then, and still perceive now, to be a new fossil directeur. The Philistines apparently loved pork, as the bones from that and other Philistine sites where Brian worked showed something of a correlation, a pond of pig bones amidst a vast steppe of sheep and goat (and practically pig-free) surrounding sites. Of course, Brian, ever the iconoclast, never quite saw the pigs-Philistines correlation as the sine qua non of Philistine origins in the Aegean region, and was never ready to accept the elevation of pig bones to index fossils (see Hesse 1990, 1995; Jones 1994, 21). But his work on pigs, despite his cautions and protestations, spiked a curiosity among a generation of archaeologists that arguably had not previously considered animal bones as a data source relevant to their socio-historical inquiries. Archaeologists working on Philistine—and non-Philistine—sites commonly cite Brian's work at Tel Miqne-Ekron when they discuss pig bones as a characteristic of Philistine culture. Luckily, the appeal of Brian's publications on animal bones from the post-Neolithic Near East seems to have sparked a wider interest among nonanimal bone archaeologists. That may be one reason why saving and studying animal bones has become normal practice in the region since the 1980s.

New excavations often provided Brian with chances to explore different themes in his research. With Paula and Brian's involvement with the Tel Dan and Megiddo expeditions came the opportunity to examine the use of animals in ancient Near Eastern religions, as items of sacrifice (Wapnish and Hesse 1991, 2000). Perhaps more than any other subject written about by Brian, except possibly food taboos, animal bones found within cultic areas provided the context for the Hesse team to explore their subject from both an anthropological point of view—discussing the bone evidence and why people sacrificed what they did—as well as from an historical point of view, integrating what the Hebrew Bible and other ancient texts had to say on sacrifice in the region's religions (Hesse, Wapnish, and Greer 2012).

This volume is meant to celebrate Brian Hesse's legacy in archaeology. As displayed in the table of contents, the book is divided thematically into six sections, papers dealing with methodology, with ethnicity, ritual, animal burials, animal economics, and site-specific analyses of faunal assemblages. The papers in the book reflect his main career foci: on the post-Neolithic Near East, and the evi-

xii Lev-Tov

dence that animal bones can contribute to archaeological studies. The book ends where Brian's career began: with a paper on bones from a Neolithic (and later) period site in Iran (Chogha Mish). Still other papers discuss lesser-known themes of Brian Hesse's work, including site formation processes, taphonomy, and the role of computers in archaeology. Brian Hesse, with Paula, explored taphonomy early in their careers, largely prior to the explosion of interest that subject saw in the 1990s (see Hesse and Wapnish 1985), as well as the computerization of archaeological data. Perhaps the greatest testaments to his influences are those papers in this volume by nonzooarchaeologists. Two of those contributions take up the subject of ethnicity in archaeology, but do so by integrating a variety of artifacts including animal bones. Another paper examines site formation processes in part through the lens of mollusk shells. Brian Hesse (with A. Rosen 1988) was also interested in site formation process, approaching that subject in part through—of course—animal bones. I believe that the inclusive approach to the archaeology of the Bronze and Iron Age Near East that is now common came about in large part due to Brian's influential publications. These demonstrated how relevant piles of broken bones from archaeological sites could be. Brian's work also helped lead to an understanding that the entire matrix of sites were of relevance, not just the pots and other "finds" floating within them.

References

- Fowles, Severin M. 2008. "Steps toward an Archaeology of Taboo." Page 15–37 In Religion, Archaeology, and the Material World. Edited by L. Fogelin. Center for Archaeological Investigations Occasional Paper 36. Carbondale: Southern Illinois University Press.
- Halpern, Baruch, and Jonathan Greer. 2011. "In Memoriam: Brian Hesse 1944–2011." *Albright News* 16 (October):17.
- Hesse, Brian. 1971. "Faunal analysis—a tool for early historic research." *JANESCU* 3:38–45.
 ——. 1978. "Evidence for Husbandry from the Early Neolithic Site of Ganj Dareh in Western Iran." PhD diss., Columbia University.
- ——. 1982. "Slaughter Patterns and Domestication: The Beginnings of Pastoralism in Western Iran." *Man* NS 17:403–17.
- ——. 1984. "These Are Our Goats: The Origins of Herding in West Central Iran." Pages 243–64 in *Animals and Archaeology 3: Early Herders and Their Flocks*. Edited by Juliet Clutton-Brock and Caroline Grigson. BARIS 202. Oxford: British Archaeological Reports.
- ——. 1986. "Animal Use at Tel Miqne-Ekron in the Bronze Age and Iron Age." BASOR 264:17–27.
- ——. 1990. "Pig Lovers and Pig Haters: Patterns of Palestinian Pork Production." *Journal of Ethnobiology* 10:195–225.
- ——. 1995. "Husbandry, Dietary Taboos and the Bones of the Ancient Near East: Zoo-archaeology in the Post-processual World." Pages 197–232 in Methods in the Mediterranean: Historical and Archaeological Views on Texts and Archaeology. Edited by David B. Small. MS 135. Leiden: Brill.

- 2002. "Between the Revolutions: Animal Use at Shaʿar Hagolan during the Yarmukian." Pages 247–55 in Shaʿar Hagolan, I: Neolithic Art in Context. Edited by Yosef Garfinkel and Michelle A. Miller. Oxford: Oxbow.
- Hesse, Brian, and Arlene Rosen. 1988. "The Detection of Chronological Mixing in Samples from Stratified Archaeological Sites." Page 117–29 in *Recent Developments in Environmental Analysis in Old and New World Archaeology*. Edited by R. Esmée Webb. BARIS 416. Oxford: British Archaeological Reports.
- Hesse, Brian, and Paula Wapnish 1985. *Animal Bone Archaeology: From Objectives to Analysis*. Manuals on Archaeology 5. Washington, DC: Taraxacum.
- Hesse, Brian, Paula Wapnish, and Jonathan Greer. 2012. "Scripts of Animal Sacrifice in the Levantine-Culture History." Pages 215–35 in Sacred Killing: The Archaeology of Sacrifice in the Ancient Near East. Edited by Anne Porter and Glenn Schwartz. Winona Lake, IN: Eisenbrauns.
- Jones, Siân. 1994. "Nationalism, Archaeology, and the Interpretation of Ethnicity: Israel and Beyond." *AnthrToday* 10:19–21.
- LaBianca, Øystein S. 1995. "The Development of the Bone Work on the Heshbon Expedition." Pages 1–14 in *Faunal Remains: Taphonomical and Zooarchaeological Studies of the Animal Remains from Tell Hesban and Vicinity.* Edited by Joachim Boessneck, Øystein Sakala LaBianca, Angela von den Driesch, Ralph E Hendrix, and Lori A Haynes. Hesban 13. Berrien Springs, MI: Andrews University Press.
- Shanks, Hershel. 2011. Milestones: Brian Hesse (1944-2011). BAR 37.4:18.
- Stager, Lawrence E. 1991. "Why Were Hundreds of Dogs Buried at Ashkelon?" *BAR* 17.3: 26–42.
- Wapnish, Paula, and Brian Hesse. 1991. "Animal Remains From Tel Dan: Pastoral Production at a Rural, Urban, and Ritual Center." *Archeozoologia* 4/2: 9–86.
- . 1993. "Pampered Pooches or Plain Pariahs? The Ashkelon Dog Burials." *BA* 56: 55–80.
- ——. 2000. "Mammal Remains from the Early Bronze Age Sacred Compound." Pages 429–62 in *Megiddo III: The 1992–1996 Seasons*. Volume II. Edited by Israel Finkelstein, David Ussishkin, and Baruch Halpern. MSSMNIA 18 Tel Aviv: Tel Aviv University Institute of Archaeology.
- Zeder, Melinda A., and Brian Hesse. 2000. "The Initial Domestication of Goats (*Capra hircus*) in the Zagros Mountains 10,000 Years Ago." *Science* 287:2254–57.



Brian Hesse with students in his zooarchaeology class at Penn State University, 2008 (courtesy Deirdre N. Fulton)

Curriculum Vitae of Brian Hesse

Education

BA: Anthropology, Columbia College, Columbia University, 1970

MPhil: Anthropology, Columbia University, 1973

PhD: Faculty of Political Science (Anthropology), Columbia University, 1978
Doctoral Dissertation: *Evidence for Husbandry from the Early Neolithic Site of Ganj Dareh in Western Iran*. Committee: Professor Ralph Solecki, Chair; Dr. Dexter Perkins, Jr., Advisor; Dr. Dennis Stanford, Dr. Malcolm McKenna, Dr. Rose Solecki; Dr. François Bordes, participant.

Employment

2003–2011: Director, Jewish Studies Program, The Pennsylvania State University

2003–2011: Professor of Jewish Studies, Anthropology, and Ancient Mediterranean Studies, The Pennsylvania State University

2005–2011: Professor Emeritus of Anthropology, University of Alabama at Birmingham

2002–2003: Chair, Department of Anthropology and Social Work, University of Alabama at Birmingham

1998–2002: Chair, Department of Anthropology, University of Alabama at Birmingham

1998-2002: Co-Editor, Near Eastern Archaeology

1995–1996: Acting Chair, Department of Anthropology, University of Alabama at Birmingham

1991–2003: Director, International Studies Program, University of Alabama at Birmingham

1990–2003: Professor, Department of Anthropology, University of Alabama at Birmingham

1983–1990: Associate Professor (tenure), Department of Anthropology, Univ. Alabama at Birmingham

1979–1983: Assistant Professor, Department of Anthropology, University of Alabama at Birmingham

1978-1988: Research Associate, Smithsonian Institution

1978-1979: Course Coordinator, Union College

1976–1978: Anthropologist, Office of Exhibits, National Museum of Natural History, Smithsonian Institution

1972: Instructor, North Shore Junior Science Museum, Long Island

1967–1969: United States Army, Training in communications (32E40), service in Vietnam.

1966–1967: Research Assistant, Department of Anthropology, New York University.

xvi Hesse

Publications

Book

1985 Animal Bone Archeology: From Objectives to Analysis. Washington DC, Taraxacum. (with P. Wapnish)

Articles

- 1971 Faunal analysis a tool for early historic research. *Journal of the Ancient Near Eastern Society of Columbia University* 3: 38-45.
- 1972 Animal domestication and species identification: inferences from ancient art. *Journal of the Ancient Near Eastern Society of Columbia University* 4: 79-80. (with P. Daly and D. Perkins, Jr.)
- 1974 Faunal remains from Karataş Semayük in southwest Anatolia." *Journal of Field Archaeology* 1(1/2): 149-160. (with D. Perkins, Jr.)
- 1975 The fauna of Phlamoudhi Melissa, an interim report. *Report of the Department of Antiquities of Cyprus*, 1975: 5-28. (with A. Ogilvy and P. Wapnish)
- 1978 The 1974 collection of faunal remains from Tel Dan. *Bulletin of the American Schools of Oriental Research* 227: 35-62. (with P. Wapnish and A. Ogilvy)
- 1979 Rodent remains and sedentism in the Neolithic: evidence from Tepe Ganj Dareh, western Iran. *Journal of Mammalogy* 60: 856-857.
- 1979 Faunal remains from Byzantine Jemmeh. Appendix D in The Ecology of Empires: An Archaeological Approach to the Byzantine Communities of the Negev Desert. Ph.D. Dissertation by Jerome Schaeffer, Department of Anthropology, The University of Arizona, Tucson. University Microfilms International, Ann Arbor, Michigan. (with P. Wapnish)
- 1979 A new permanent exhibit at the Smithsonian Institution. *Archaeology* May-June: 53-55. (with R. K. Evans)
- 1980 Archaeological evidence for Muscovy Duck in Ecuador. Current Anthropology 21: 139-140.
- 1980 Faunal remains from Fort Washington. In Archeological Investigations for the Restoration of Old Fort Washington, Maryland, National Capital Parks-East, 1977–1979. Volume II: The Material Culture by Thomas E. McGarry and David A. Zmoda, pp. 277–302. National Park Service, Denver Service Center, National Capital Team, Falls Church, Virginia (appeared 1996).
- 1981 The association of animal bones with burial features. In *The Ayalan Cemetery*, by D.H. Ubelaker, pp. 134–138. *Smithsonian Contributions to Anthropology* 29. Smithsonian Institution Press, Washington, D.C.
- 1981 Animal remains from Bab edh-Dhra: evidence for food offerings and a possible sacrifice. *Annual of the American Schools of Oriental Research* 46: 133–136. (with P. Wapnish)
- 1981 Cooperative research in northern Chile: searching for the origins of pastoralism. *Report on Chilean University Life* 10: 9-12.
- 1981 Archaeological evidence for camelid exploitation in the Chilean Andes. Saugetierkundliche Mitteilungen 30: 201-211.
- 1982 Animal domestication and oscillating climates. *Journal of Ethnobiology* 2: 1-15.
- 1982 Slaughter patterns and domestication: the beginnings of pastoralism in western Iran. *Man* 17(n.s.): 403-417.
- 1982 Bias in the zooarcheological record: suggestions for interpretation of bone counts in faunal samples from the Plains. In *Plains Indian Studies*, edited by D.H. Ubelaker and H. Viola, pp. 157–162. *Smithsonian Contributions to*

Curriculum Vitae xvii

- Anthropology 30. Smithsonian Institution Press, Washington, D.C.
- 1983 Appendix I. Report on the fauna from Phlamoudhi Vounari. In *Phlamoudhi Vounari: A Sanctuary Site in Cyprus*, by S.M.S. Al-Radi, pp. 116–118. *Studies in Mediterranean Archaeology* LXV. P. Aström, Göteburg. (with A. Ogilvy and P. Wapnish)
- 1983 and M. Moran. Non-artifactual bone. In, Historic Structure Report, Archaeological Data Section, Lindenwald, Martin Van Buren National Historic Site, Kinderhook, New York, pp. 35–36, 157–166 and Appendix III: Distribution of faunal remains by excavation unit, pp. 221–230, National Park Service, Denver.
- 1984 These are our goats: the origins of herding in west-central Iran. In *Animals and Archaeology 3. Early Herders and Their Flocks*, edited by J. Clutton-Brock and C. Grigson, pp. 243–264. *BAR International Series* 202. British Archaeological Reports, Oxford.
- 1984 Archaic exploitation of small mammal and birds in northern Chile. *Estudios Atacameños* 7: 42-61.
- 1985 Ancient flocks and barnyards. *American Schools of Oriental Research Newsletter* 37(1): 10–11.
- 1986 Appendix F. Faunal Remains. In *Tel Mique-Ekron. Report of the 1984 Excavations, Field IIISE*, by B. M. Gittlen, pp. 227–250. W .F. Albright Institute of Archaeological Research, Jerusalem. (with P. Wapnish)
- 1986 Appendix F. Faunal Remains. In *Tel Miqne-Ekron. Report of the 1984 Excavations, Field INE/SE*, by A. E. Killebrew, pp. 214–237. W. F. Albright Institute of Archaeological Research, Jerusalem. (with P. Wapnish)
- 1986 Animal use at Tel Miqne-Ekron in the Bronze Age and Iron Age. *Bulletin of the American Schools of Oriental Research* 264: 17–27.
- Buffer resources and animal domestication in prehistoric northern Chile. In Archæozoologia, pp. 73–85. 5th International Congress of Archaeozoology, Bordeaux.
- 1987 Faunal remains. In Chapter 17. In *The Roman Port and Fishery of Cosa*, by A.M. McCann, J. Bourgeois, E. K. Gazda, J. P. Oleson, and E. L. Will, pp. 315–317. Princeton University Press, Princeton. (with P. Wapnish)
- 1987 Ancient herds and pack trains in the Chilean Andes. *Chilean University Life* 22: 8–9.
- 1988 Urbanization and the organization of animal production at Tell Jemmeh in the Middle Bronze Age Levant. *Journal of Near Eastern Studies* 47: 81–94. (with P. Wapnish)
- 1988 Comment on Haskel Greenfield's "On the Origins of Milk and Wool Production in the Old World." *Current Anthropology* 29: 586-587.
- 1988 The detection of chronological mixing in samples from stratified archaeological sites. In, *Recent Developments in Environmental Analysis in Old and New World Archaeology*, edited by R. E. Webb., pp. 117–129. *BAR International Series* 416. British Archaeological Reports, Oxford. (with A. Rosen)
- 1988 The contribution and organization of pastoral systems." In *Early Israelite*Agriculture, edited by Ø. S. LaBianca and D. C. Hopkins, pp. 29–41. Occasional
 Papers of the Institute of Archaeology, Andrews University 1. Andrews
 University Press, Berrien Springs, Michigan. (with P. Wapnish)
- 1988 Chapter 8. Faunal remains. *Journal of Alabama Archaeology* 34: 184–198.

- (appeared 1992). Rogers-CETA site report, edited by C.R. Nance. (with Susan Henson)
- 1990 Paleolithic faunal remains from Ghar i-Khar, western Iran. In *Early Animal Domestication and Its Cultural Context*, edited by P. J. Crabtree, D. Campana, and K. Ryan, pp. 37–45. MASCA Research Papers in Science and Archaeology, Special Supplement to Volume 6, pp. 37–45. University of Pennsylvania, Philadelphia.
- 1990 Biochemical differentiation of archaeological equid remains: lessons from a first attempt. *Journal of Field Archaeology* 17: 39–48. (with A. S. Gilbert and J. M. Lowenstein)
- 1990 Domestication of hyrax (*Procavia capensis*), in Yemen. *Journal of Ethnobiology* 10: 23–32. (with T. B. Stevenson)
- 1990 Pig lovers and pig haters: patterns of Palestinian pork production. *Journal of Ethnobiology* 10: 195–225.
- 1991 Faunal remains from Tel Dan: perspectives on animal production at a village, urban and ritual center. *ArchæoZoologia* 4: 9–86. (with P. Wapnish)
- Carnivorous pastoralism: part of the origins of domestication or a secondary product revolution? In *Culture and Environment: a Fragile Coexistence*, edited by Ross W. Jamieson, Sylvia Abonyi, and Neil A. Mirau, pp. 99–109.
 Proceedings of the 24th Chacmool Conference. The Archaeological Association of the University of Calgary, Alberta.
- 1993 Pampered pooches or plain pariahs?: the Ashkelon dog burials. *Biblical Archaeologist* 56(2): 55–80. (with P. Wapnish)
- 1995 Husbandry, dietary taboos and the bones of the ancient Near East: zooarchaeology in the post-processual world. In *Methods in the Mediterranean: Historical and Archaeological Views on Texts and Archaeology*, edited by D. B. Small, pp. 197–232. E. J. Brill, Leiden.
- 1995 Animal husbandry and human diet in the ancient Near East. In Civilizations of the Ancient Near East, Volume I, edited by J. M. Sasson, pp. 203–222. Charles Scribner's Sons, New York.
- 1996 Pig's feet, cattle bones and bird's wings. Biblical Archaeology Review 22(1): 62.
 (Sidebar in "The Fury of Babylon" by Lawrence E. Stager.) (with P. Wapnish)
- 1996 The Hajar ar-Rayhani Fauna: a first look at Yemen's Iron Age pastoral economy. In *Retrieving the Past: Essays in Archaeological Research and Methodology in Honor of Gus W. Van Beek*, edited by Joe Seger, pp. 103–122. Cobb Institute of Archaeology, Mississippi State University, Starkville, Mississippi.
- 1997 The Hajar ar-Rayhani fauna: variation in the animal economy of Iron-Age Yemen. In *Environmental Research in Support of Archaeological Investigations in the Yemen Arab Republic*, edited by W. C. Overstreet and J. A. Blakely, pp. 261–292. The Wadi al-Jubah Archaeological Project, Volume 5. American Foundation for the Study of Man, Washington, D.C.
- 1997 Articles in *The Oxford Encyclopedia of Archaeology in the Near East*, edited by E. M. Meyers. Oxford University Press, New York. "Animal husbandry"; Volume I, pp. 140–143. "Cattle and oxen"; Volume I, pp. 442–443. "Pigs"; Volume IV, pp. 347–348.
- 1997 Articles in *The Oxford Encyclopedia of Archaeology in the Near East*, edited by E. M. Meyers. Oxford University Press, New York. "Paleozoology"; Volume IV, pp. 206–207. (with P. Wapnish)
- 1997 Articles in The Oxford Encyclopedia of Archaeology in the Near East, edited

Curriculum Vitae xix

- by E. M. Meyers. Oxford University Press, New York. "Dogs"; Volume II, pp. 166–167. "Equids"; Volume II, pp. 255–256. (with P. Wapnish)
- 1997 Can pig remains be used for ethnic diagnosis in the ancient Near East? In The Archaeology of Israel: Constructing the Past, Interpreting the Present, edited by N. A. Silberman and D. B. Small. Journal for the Study of the Old Testament Supplement Series No. 237, pp. 238-270. Sheffield Academic Press, Sheffield. (with P. Wapnish)
- Pig Use and Abuse in the Ancient Levant: Ethnoreligious Boundary Building With Swine. In Ancestors for the Pigs: Pigs in Prehistory, edited by Sarah Nelson, pp. 123–136. MASCA Research Papers in Science and Archaeology, Volume 15. Museum Applied Science Center for Archaeology, University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia. (with P. Wapnish)
- 1999 Iron Age Faunal Remains from Ai and Raddana. Published as an appendix in "An Early Iron Age Village at Khirbet Raddana: the Excavations of Joseph A. Callaway." Ph.D. Dissertation of Z. Lederman, Department of Near Eastern Languages and Cultures, Harvard University.
- 2000 The initial domestication of goats (*Capra hircus*) in the Zagros Mountains 10,000 years ago. *Science* 287: 2254–2257. (with M.A. Zeder)
- 2000 Mammal Remains from the Early Bronze Sacred Compound. In, Megiddo III, The 1992–1996 Seasons, edited by Israel Finkelstein, David Ussishkin and Baruch Halpern, pp. 429–462. Sonia and Marco Nadler Institute of Archaeology, Tel Aviv University, Tel Aviv. (with P. Wapnish)
- 2000 Urban Life in the Highlands of Central Jordan: A Preliminary Report of the 1996 Tell Madaba Excavations. *Annual of the Department of Antiquities* of Jordan XLIV, pp. 211–229. (with T. Harrison, S. H. Savage, and D. W. Schnurrenberger)
- 2001 Commodities and Cuisine: Animals in the Early Bronze Age of Northern Palestine. In Studies in the Archaeology of Israel and Neighboring Lands in Memory of Douglas L. Esse, edited by Samuel R. Wolff, pp. 251–282. Studies in Ancient Oriental Civilization No. 59. Oriental Institute of the University of Chicago, Chicago. (with P. Wapnish)
- 2002 Between the Revolutions: Animal Use at Sha'ar Hagolan During the Yarmukian. In Sha'ar Hagolan, I. Neolithic Art in Context, edited by Y. Garfinkel and M. A. Miller, pp. 247–255. Oxbow Books, Oxford.
- 2002 An Archaeozoological Perspective on the Cultural Use of Mammals in the Levant. In *A History of the Animal World in the Ancient Near East*, edited by Billie Jean Collins, pp. 457–492. E. J. Brill, Leiden. (with P. Wapnish)
- 2000–2002 Editorials in *Near Eastern Archaeology.* Volume 62(1) through Volume 64(2). (with P. Wapnish)
- Neolithic Ashkelon: Meat Processing and Early Pastoralism on the
 Mediterranean Coast. *Eurasian Prehistory* 3: 43–72. (with Y. Garfinkel, D. Dag,
 P. Wapnish, D. Rookis, G. Hartman, D.E. Bar-Yosef and O. Lernau)
- Zooarchaeological Procedures. In Ashkelon 1: Introduction and Overview (1985–2006), by L. E. Stager, J. D. Schloen, and D. M. Master, pp. 207–214.
 Final Reports of the Leon Levy Expedition to Ashkelon. Eisenbrauns, Winona Lake, Indiana. (with P. Wapnish)
- 2011 Animal Production and Bone Debris at Ashkelon in the Seventh Century BCE. In Ashkelon 3: The Seventh Century B.C., by L. E. Stager, D. M. Master, and J. D.

xx Hesse

- Schloen, pp. 615–643. Final Reports of the Leon Levy Expedition to Ashkelon. Eisenbrauns, Winona Lake, Indiana. (with D. Fulton, and P. Wapnish)
- 2012 Scripts of Animal Sacrifice in Levantine Culture-History. In Sacred Killing: The Archaeology of Sacrifice in the Ancient Near East, edited by A. Porter and G. Schwartz; pp. 217–235. Eisenbrauns, Winona Lake, Indiana. (with P. Wapnish, and J. Greer)
- in press Mendes 2007 Research Project: Initial Zooarchaeological Report. In *Delta Reports*, edited by D. B. Redford. David Brown Book Company, Oakville, Connecticut. (with D. N. Fulton)

Reviews

- 1987 Review of *Tac-Gorsium* by Sandor Bökönyi. *Zooarchaeological Research News* 6(3): 9–13.
- Review of *Teeth* by Simon Hillson. *American Antiquity* 53: 206–207.
- Review of *Feeding Cities* by Melinda Zeder. *American Antiquity* 59: 171–172.
- 1997 Review of *Ritual Treatment of Human and Animal Remains*, edited by Sue Anderson and Katherine Boyle. *Journal of Archaeological Science* 24: 961–962.

Select Presentations

- with A. Ogilvy. *The Stobi Faunal Project*. Stobi Symposium, Boston University, April 1977.
- Afforestation and Domestication in the Zagros. Ecology Symposium, Smithsonian Institution, Feb. 1978.
- Young Kill and Domestication: a Reconsideration of the Criticism. SAA, Philadelphia, May 1980.
- with P. Wapnish, *Tell Jemmeh: Animal Exploitation in Historical Perspective*. American Schools of Oriental Research, Dallas, November 1980.
- Animal Domestication and Oscillating Climates. American Anthropological Association 1980.
- The Origins of Pastoralism in the Chilean Andes. Alabama Academy of Science. Auburn, April 1981.
- with D. Von Endt, *The Chemical Content of Archaeological Bone: Notes Toward the Measurement of Differential Attrition in Faunal Samples.* Annual Meeting of the SAA, San Diego, May 1981.
- Morphological Variability and Animal Domestication. Alabama Academy of Science, April 1982.
- Goat Domestication in Western Iran: an Application of an Osteometric Technique. IVth International Congress on Archaeozoology, London, April 1982.
- Morphological Variability in Egyptian Equids: the Evidence from Lisht and Thebes.

 International Symposium on Late Pleistocene and Early Holocene Distribution of the Equids in the Palearctic Region, Tübingen 1982.
- Small Mammal and Bird Remains from Archaic Sites in Northern Chile. International Conference on the Central Andes, San Pedro de Atacama, Chile, January 1983.
- Flamingo Bonnets and Chinchilla Wraps: Buffer Resources in Preceramic Northern Chile. Vth Ethnobiology Conference, Norman, Oklahoma, April 1983.
- Climatic Variability and Animal Domestication in the Zagros and the Andes. Seminar Series, Department of Geosciences, Texas A&M University, November 1983.
- Animal and Man in Historic Sites in Israel: a Contextual Analysis. Seminar Series, W. F. Albright Institute of Archaeological Research, Jerusalem, November 1984.
- with A. Rosen, Chronological Contamination in Stratified Archaeological Sites. 50th

Curriculum Vitae xxi

- Annual Meeting of the Society for American Archaeology, Denver, May 1985.
- with M. Metzger and S. Henson, *Rural-Urban Exchange in Animal Products in Eastern Mediterranean Societies.* 51st Annual Meeting of the Society for American Archaeology, New Orleans, April 1986.
- with P. Wapnish, *The Contribution and Organization of Pastoral Systems*. Ancient Mediterranean Food Systems Symposium, Annual Meeting of the American Schools of Oriental Research, November 1986.
- with P. Wapnish, Pig Avoidance in Iron Age Canaan. ASOR, Boston, December 1987.
- with P. Wapnish, *Demonstrating the Ritual use of Animals at Tel Dan, Israel.* Archaeological Congress 1989.
- with P. Wapnish, *Postprocessual Zooarchaeology: Zoopolitics and Zooideology in Ancient Canaan.* Annual Meeting of the Society for American Archaeology, Atlanta, April 1989.
- with P. Wapnish, *The Persian Period Dog Burials at Ashkelon*. American Oriental Society, March 1990.
- Architectural Context and Zooarchaeological Finds, the Evidence From Dan and Batash.

 Annual Meeting of the American Schools of Oriental Research, New Orleans,
 November 1990.
- Archaeology and the Prohibition of Pigs. American Anthropological Association, New Orleans, December 1990.
- with B. Grantham, *Cuisine Zooarchaeology*. Annual Meeting of the Alabama Academy of Science, March 1991.
- with P. Wapnish, *The Dog Cemetery? at Ashkelon*. Meeting of the Society for Ethnobiology, March 1991.
- Carnivorous Pastoralism: Part of the Origins of Domestication or a Secondary Product Revolution? 24th Chacmool Conference, University of Calgary, Alberta, November 1991.
- with P. Wapnish, *New Perspectives and Evidence on Ethnicity and the Pig in the Levant.* American Schools of Oriental Research, 1995.
- with C. Christen, *A First Look at Fatimid Animal Exploitation*. American Schools of Oriental Research, 1995.
- The Archaeology of Ethnicity: A Porcine Perspective. Society for American Archaeology, 1996.
- with D. B. Small, *Shrive Yourself!: Archaeologicial Emendations to Social Theory*. Symposium, Annual Meeting of the Society for American Archaeology, New Orleans, April 11, 1996.
- A View from Afar: Comments on the SymposiumZooarchaeology in the Southeast. Annual Meeting of the Southeastern Archaeological Association, Birmingham, November 7, 1996.
- Pig Use and Abuse: Ethnoreligious Boundary Building with Swine. American Anthropological Association 1996.
- with Paula Wapnish, Zooarchaeological Research at Ashkelon: The Middle Bronze Age Evidence. Society of Biblical Literature 1998.
- Rethinking the Place of Animals in the Neolithic: New Evidence from Sha'ar Hagolan and Ashkelon. Presented to the Food Symposium, American Schools of Oriental Research Annual Meeting, Boston, November 17, 1999.
- with P. Wapnish, *The Zooarchaeology of Complex Societies in the Bronze and Iron Age.* Presented to the Department of Near Eastern Languages and History, Emory University, March 2000.

xxii Hesse

with E. Brown, From Village to State: Changes in the Animal Economy During the Iron Age. American Schools of Oriental Research 2000.

Discussant, SAA Symposium, "The Wild and the Tame." Society for American Archaeology, 2001.

Pigs, Camels and Dogs: Zooarchaeological Riddles. University of South Florida American Institute of Archaeology, January 2004

with D. Fulton, Looking at Carcasses: Sheep and Goats at Carthage, Tunisia, and Al Qisha, Yemen. American Schools of Oriental Research, November 2010.

Major Fellowships and Grants

1973 Ford Foundation Archaeological Training Grant

1975 Smithsonian Institution Predoctoral Fellowship

1981 Linn-Henley Foundation Grant

1982 National Science Foundation Travel Award

1984 National Endowment for the Humanities Fellowship

1986 Fulbright Fellowship

1989-1991 National Science Foundation Grant

Abbreviations

AASOR Annual of the American Schools of Oriental Research

ÄAT Ägypten und Altes Testament

AB Anchor Bible

ABD Anchor Bible Dictionary. Edited by David Noel Freedman. 6

vols. New York: Doubleday, 1992.

ABRL Anchor Bible Reference Library
ABS Archaeology and Biblical Studies

ADAJ Annual of the Department of Antiquities of Jordan
ADPV Abhandlungen des Deutschen Palästina-Vereins
AeL Ägypten und Levante/Egypt and the Levant

AJA American Journal of Archaeology

Am Anthropol American Anthropologist

ANES Ancient Near Eastern Studies Supplement Series

AnSt Anatolian Studies
AnthrToday Anthropology Today
AuOr Aula Orientalis
BA Biblical Archaeologist

BAR Biblical Archaeology Review

BARIS British Archaeological Reports International Series
BASOR Bulletin of the American Schools of Oriental Research

BASORSup Bulletin of the American Schools of Oriental Research Supple-

ment

BP before the present time

BSA Bulletin on Sumerian Agriculture

BTAVO Beihefte zum Tübinger Atlas des Vorderen Orients

BZAW Beihefte zur Zeitschrift für die alttestamentliche Wissenschaft CChEM Contributions to the Chronology of the Eastern Mediterra-

nean.

CHANE Culture and History of the Ancient Near East

COS The Context of Scripture. Edited by William W. Hallo. 3 vols.

Leiden: Brill, 1997-2002.

HdO Handbook of Oriental Studies

EANEC Explorations in Ancient Near Eastern Civilizations

EB Early Bronze Age

ErIsr Eretz-Israel

xxiv Abbreviations

ESI Excavations and Surveys in Israel

ha hectare

HACL History, Archaeology, and Culture of the Levant

HBAI Hebrew Bible and Ancient IsraelIAAR Israel Antiquities Authority Reports

IEJ Israel Exploration Journal

JANESCU Journal of the Ancient Near Eastern Society of Columbia Univer-

sity

JAS Journal of Archaeological Science

JCPS Jewish and Christian Perspectives Series

JCS Journal of Cuneiform Studies

JCSMS Journal of the Canadian Society for Mesopotamian Studies

JFA Journal of Field Archaeology
JHS Journal of Hebrew Scriptures
JNES Journal of Near Eastern Studies

JPOS Journal of the Palestine Oriental Society
JSOT Journal for the Study of the Old Testament

JSOTSup Journal for the Study of the Old Testament Supplement Series
JSSEA Journal of the Society for the Study of Egyptian Antiquities

km kilometer

LAI Library of Ancient Israel

LB Late Bronze Age
LCL Loeb Classical Library

LHBOTS Library of Hebrew Bible/Old Testament Studies

m meter

MAA Mediterranean Archaeology and Archaeometry

MAU minimum number of animal units

MAVA Materialien zur allgemeinen und vergleichenden Archäologie

MB Middle Bronze Age

MNE minimum number of elements
MNI minimum number of individuals
MS Mnemosyne Supplementum

MSSMNIA Monograph Series of the Sonia and Marco Nadler Institute of

Archaeology

n.d. no date

NEA Near Eastern Archaeology

NEAEHL The New Encyclopedia of Archaeological Excavations in the Holy

Land. Edited by Ephraim Stern. 5 vols. Jerusalem: Israel Explo-

ration Society, 1993, 2008.

NF number of fragments

NICOT New International Commentary on the Old Testament

Abbreviations xxv

NISP number of identified specimens or number of individual speci-

mens

NumC Numismatic Chronicle

NS new series

OBO Orbis Biblicus et Orientalis

OBOSA Orbis Biblicus et Orientalis Archaeological Series

OEANE The Oxford Encyclopedia of Archaeology in the Near East. Ed-

ited by Eric M. Myers. 5 vols. New York: Oxford University

Press, 1997.

OIP Oriental Institute Publications
OJA Oxford Journal of Archaeology
OLA Orientalia Lovaniensia Analecta

OpAth Opuscula Atheniensia
OtSt Oudtestamentische studiën
PAe Probleme der Ägyptologie

PEFQS Palestine Exploration Fund Quarterly Statement

PEQ Palestine Exploration Quarterly pers. (comm.) personal (communication)

pl(s). plate(s)

PNAS Proceedings of the National Academy of Sciences

RB Revue Biblique

RDAC Report of the Department of Antiquities, Cyprus

RSF Rivista di Studi Fenici

SAHL Studies in the Archaeology and History of the Levant

SAOC Studies in Ancient Oriental Civilization
SJLA Studies in Judaism in Late Antiquity
SJOT Scandinavian Journal of the Old Testament

SM Scripta Mediterranea

Strata: Strata: Bulletin of the Anglo-Israel Archaeological Society

SymS Symposium Series

TA Tel Aviv

TAVO Tübinger Atlas des Vorderen Orients TIM total identified mammal remains

UF Ugarit Forschungen VT Vetus Testamentum

VTSup Supplements to Vetus Testamentum

WO Die Welt des Orients

ZDPV Zeitschrift des deutschen Palästina Vereins ZAW Zeitschrift für die Alttestamentliche Wissenschaft

ZfA Zeitschrift für Archäologie