European Journal of Archaeology 22 (4) 2019, 588–616

Book Reviews

Erika Guttmann-Bond. *Reinventing Sustainability: How Archaeology Can Save the Planet* (Oxford & Philadelphia: Oxbow, 2019, 192pp., 59 illustr., pbk, ISBN 9781785709920)

Sustainability has been a topic of study in archaeology and cognate disciplines for some decades now, and even more so with the growing need for deeper-time perspectives on developing resilient strategies (e.g. van der Leeuw & Redman, 2002; Costanza et al., 2007; Scarborough, 2009; Isendahl & Stump, 2019). Rather than venturing into well-trodden topics of applied archaeology and historical ecology—such as socio-ecological systems and resilience to mention but two—, *Reinventing Sustainability* distils the wonders and insights of a personal, inspiring journey into past successes. An experienced archaeologist, Erika Guttmann-Bond is no novice to asking the past about the present—or to eye-catching titles (e.g. Guttmann-Bond, 2010). Her scholarly contribution to environmental archaeology, especially the study of soils, combined with an eclectic approach to long-lived landscapes has inspired archaeology students and colleagues alike. Building on her university teaching, multidisciplinary research, and well-travelled experience, this book is about 'successful' stories of how ancient and long-lived practices can support sustainable lifeways, contributing to an important tradition of studies (e.g. Redman & Foster, 2008; Widgren & Sutton, 2004; Rostain, 2013). The first of seven chapters sets the scene for the journey into sustainable farming, starting with wetlands and desert environments. Then, the book takes a turn to address food security, soil degradation, and vernacular architecture. The last chapter calls for rising awareness, hope, and action to restoring the health of environments, developing sustainable cities, and mitigating climate change.

Chapter 1 presents the agenda of the book to discuss 'sustainable agriculture in the past, and the engineering works that supported' (p. 1), with the wish to promote the integration of ancient ideas and modern science to revitalise towns, environments, and economies. Pre-industrial agriculture and building techniques across time and cultures offer plentiful examples of simple and low-cost—and high-return—practices that depend on local materials and not on fossil fuels. Here, we learn about the importance of soils, especially soil organic matter, but also soil organisms and processes supporting agriculture, and how these are studied in environmental archaeology.

The following two chapters dive into case studies illustrating ways of farming in wetlands and deserts—following very closely an earlier paper by Clark Erickson (1992), cited in the text. From Mesoamerican *chinampas* (artificial islands) and raised fields to British meadows and Dutch polders, Chapter 2 deals with how people have adapted to wetlands. What are wetlands? What makes them so special for human settlement and biodiversity in the past as well as today? Answers to these questions can be found elsewhere (e.g. Coles, 1992; Menotti & O'Sullivan, 2012; Rostain, 2013). But, what I enjoyed most in this chapter is the seemingly effortless clarity in explaining complex aspects of the

https://doi.org/10.1017/eaa.2019.51 Published online by Cambridge University Press

soil-water nexus, and creative practices for sustainable food production over wetlands.

Moving onto deserts, Chapter 3 begins with a long section on the success of experimental farms established in the Negev desert (cf. Erickson, 1992: 42). Next, a brief mention of American Ancestral Pueblo culture (referred to as Anasazi) is welcomed, even though one would wish for a bit more detail or references on one of the most fascinating and best studied archaeological examples of ancient water management (e.g. Scarborough, 2009). From here, the path does not lead to the Maya lowlands as one might expect. Instead, a short leap over to Libya takes us straight to the famous *qanāts* (underground water irrigation systems), the far less known practice of rock mulching, and clay-pot irrigation. Long a topic of scholarly enquire, *qanāts* continue to enjoy sustained interest across disciplines and fields (see e.g. Semsar Yadzi & Labbaf Khaneiki, 2016). Unsurprisingly, Guttmann-Bond cherry-picks the long-lived *qanāt* systems of Iran, which are treasured heritages that, in some cases, continue to supply water for farming and domestic needs—as monitored by the UNESCO International Centre on Qānats and Historic Hydraulic Structures, Iran (http://icqhs.org/SC.php?type=static&id=25).

The book then goes on to engage with concerns on global warming, desert expansion, and water scarcity, all key players in the riddles to create and maintain food security, the topic of Chapter 4. Those unsure about what food security is or looking for archaeological studies of it will have to make provision elsewhere (e.g. FAO, 2008; Nelson et al., 2015; Logan, 2016). While acknowledging the lack of a common definition, Guttmann-Bond addresses food security in the context of sustainable agriculture, which is here taken as a synonym of agroecology. However, agroecology is largely understood as the study (or science) of the interaction between plants, animals, and environments in an agricultural system—for a collection of definitions, FAO maintains a rich online resource: the Agroecology Knowledge Hub (http://www.fao.org/agroecology/knowledge/definitions/en/). Definitions aside, the author makes a strong case for the environmental benefits, but also social and economic ones, of agroecological methods. An important point here is that support of industrialised agriculture is predicated upon the assumption that large scale farming is more cost efficient than small scale one. Yet, as the author points out, smallholder farmers continue to feed a great portion of the global population. Against the alarming impacts of using genetically modified crops and animal breeds, the author emphasises the benefits of growing traditional varieties, the backbone of 'maslin' (planting different, related crops together, p. 77), and intercropping, underpinning social and economic growth from medieval Europe and China to South America. Such is the strength and longevity of these practices that they are now being reintroduced as illustrated by references to Senegal, India, Mexico, Bolivia, and Cuba. The latter leads to an inspiring section where the reader will be mesmerised by the outcomes of economic and political isolation: how Cuba has become a world leader in the development of natural pest management. Many of us will know about Havana's famous urban gardens, far fewer will have heard of Cuban laboratories and their achievements in pioneering the production of bacteria that can stabilise phosphorus in the soil and fix nitrogen—an astonishing success of driving science to mimic nature.

Chapter 5 deals with the importance of soil for farming. A cursory section on the origins of agriculture follows the conventional narrative of population growth equals farming expansion, leading to soil degradation—Mesopotamia and soil salinization resulting from intensive irrigation being the chosen example. The writing then delves

https://doi.org/10.1017/eaa.2019.51 Published online by Cambridge University Press

into 'sustainable' ways of managing soil and water from fallowing to terracing, and anthropogenic soils. Drawing on her PhD research, Guttmann-Bond returns to the Scottish islands to show how comparative and multi-scalar analysis can reveal unexpected histories of poor soils turned into fertile gardens by prehistoric and medieval farmers. This also showcases soil micromorphology and its unique potential to read the past in buried soils. There is only room for passing references to soil management in the Tropics. The mention of *terra preta*, for example, could have been linked to earlier discussions of wetlands and food security (Chapters 2 and 4, even though the Amazon Basin makes only rare appearances in the bibliography). Returning to familiar British landscapes, the narrative regains strength in addressing soil erosion, the impact of ploughing versus tillage, and the conserving function of field boundaries. Here, one would have wished for a comment on the unique potential of combing soil microstratigraphy, and ethnographic and experimental work to profile the impact of farming, especially in the light of the distinctive scholarly contributions from the British and Irish Isles (e.g. Lewis, 2012), including the author's own work, amply cited in this book.

Chapter 6 ventures to discuss vernacular architecture. Expectations of learning about archaeological case studies or how scientific advances and experimental works are adding new details to understanding 'living' earthen architecture throughout centuries might be satisfied elsewhere (e.g. Friesem et al., 2011). Following a cursory look at mud architecture in desert environments—why not return to the Ancestral Puebloan farmers (p. 60) and mention here their famous adobe architecture or the cliff dwellings?—, the author offers a valuable discussion of heating and cooling systems in vernacular architecture, leading to sections on an assorted list of examples and issues (e.g. cob houses, earthquake-resistant building systems, floating houses, urban gardens, and architectural anthropology). The last chapter aims at 'bringing it all together' (p. x). Those (like myself) unable to grasp the title ('The Tao of Environmental Management') should read on and find new inspiration on the success stories discussed before and revisited here, from terracing to underground water systems, from greening the cities to fungi and the importance of symbiosis. The last pages take us to suffering oceans and coral reefs. All worthy of thought, yet it is hard to see the link with the rest of the volume. A bridge could have been provided by bringing archaeological (and historical ecological) knowledge in; for example, the record of resilient coastal adaptation in Norse Greenland amid climate change (e.g. Dugmore et al., 2012). The book ends with the future and wishful thinking inspired by wildflowers' return to Wales.

Reinventing Sustainability keeps a distinctive thought-provoking, sharp, and at times romantic tone as it builds on, and expands, topics and arguments first addressed in an earlier article, fittingly titled 'Sustainability Out of the Past' (Guttmann-Bond, 2010). If some of us might still be looking for that pie in the sky (ibid: 362–63), most will appreciate the author's effort to shed light on the significance of the past, and archaeology, for present-day global issues. The original running thread of this book is to show how integrating historical and traditional strategies with scientific advances from engineering to biochemistry can and is delivering sustainability.

Written in a casual, often colloquial, style, this book offers a valuable narrative for students, teachers, professionals, and others interested in archaeology. In-set boxes define principles, processes (e.g. Nitrogen fixation, p. 5), and timeframes. Colour illustrations enlighten the text, but

https://doi.org/10.1017/eaa.2019.51 Published online by Cambridge University Press

the reader will have to be imaginative—as scales are not always provided (e.g. figs 2.2, 5.7). If contextual knowledge might be sought elsewhere, inspiration and insights are all in here to fuel curiosity, commitment, and critical thinking.

References

Coles, B., ed. 1992. *The Wetland Revolution in Prehistory* (WARP-Wetland Archaeology Research Project Occasional Paper 6). Exeter: The Prehistoric Society & WARP.

Costanza, R., Graumlich, L.J., & Steffen, W., eds. 2007. *Sustainability of Collapse? An Integrated History and Future of the People on Earth*. Cambridge, MA, & London: The MIT Press.

Dugmore, A.J., McGovern, T.H., Vésteinsson, O., Arneborg, J., Streeter, R., & Keller, C. 2012. Cultural Adaptation, Compounding Vulnerabilities and Conjunctures in Norse Greenland. *Proceedings of the National Academy of Sciences*, 109(10): 3658–63. doi: https://doi.org/10.1073/pnas.1115292109

Erickson, C. 1992. Applied Archaeology and Rural Development: Archaeology's Potential Contribution to the Future. *Journal of the Steward Anthropological Society*, 20(l–2): l–16.

FAO 2008. *An Introduction to the Basic Concepts of Food Security* (Food Security Concepts and Frameworks). EC-FAO Food Security Program [accessed 10 July 2019]. Available at: <http://www.fao.org/3/al936e/al936e00.pdf>

Friesem, D., Boaretto, E., Eliyahu-Behar, A., Shahack-Gross, R. 2011. Degradation of Mud Brick Houses in an Arid Environment: A Geoarchaeological Model. *Journal of Archaeological Science*, 38(5): 1135–47. doi: https://doi.org/10.1016/j.jas.2010.12.011

Guttmann-Bond, E. 2010. Sustainability Out of the Past: How Archaeology Can Save the Planet. *World Archaeology*, 43(2): 355–66. doi: https://doi.org/10.1080/00438243.2010.497377

Isendahl, C. & Stump, D., eds. 2019. *The Oxford Handbook of Historical Ecology and Applied Archaeology*. Oxford: Oxford University Press.

Logan, A. 2016. An Archaeology of Food Security in Banda, Ghana. *Archeological Papers of the American Anthropological Association*, 27: 106–19. doi: https://doi.org/10.1111/apaa.12077

Lewis, H. 2012. *Investigating Ancient Tillage: An Experimental and Soil Micromorphological Study* (BAR International Series 2388). Oxford: Archaeopress.

Menotti, F. & O'Sullivan, A., eds. 2012. *The Oxford Handbook of Wetland Archaeology*. Oxford: Oxford University Press.

Nelson, M.C., Ingram, S.E., Dugmore, A.J., Streeter, R., Peeples, M.A., McGovern, T.H., et al. 2015 Climate Challenges, Vulnerabilities, and Food Security. *Proceedings of the National Academy of Sciences*, 113(2): 298–303. doi: https://doi.org/10.1073/pnas.1506494113

Redman, C.L. & Foster, D.R., eds. 2008. *Agrarian Landscapes in Transition: Comparison of Long-term Ecological and Cultural Change*. Oxford & New York: Oxford University Press.

Rostain, S. 2013. *Islands in the Rainforest: Landscape Management in Pre-Columbian Amazonia*. Walnut Creek, CA: Left Coast Press.

Scarborough, V.L. 2009. Beyond Sustainability: Managed Wetlands and Water Harvesting in Ancient Mesoamerica. In: C.T. Fisher, J.B. Hill & G.M. Feinman, eds. *The Archaeology of Environmental Change: Socionatural Legacies of Degradation and Resilience*. Tucson: University of Arizona Press, pp. 62–82.

Semsar Yadzi, A. & Labbaf Khaneiki, M. 2016. *Qānat knowledge: Construction and Maintenance*. Amsterdam: Springs.

van den Leeuw, S. & Redman, C.L. 2002. Placing Archaeology at the Centre of Socio-natural Studies. *American Antiquity*, 67(4): 597–605. doi: https://doi.org/10.2307/1593793

Widgren, M. & Sutton, J.E.G., eds. 2004. *Islands of Intensive Agriculture in Eastern Africa: Past and Present*. London: British Institute in Eastern Africa.

FEDERICA SULAS
Centre for Urban Network Evolutions (UrbNet), Aarhus University, Denmark

doi:10.1017/eaa.2019.51