

BOOK REVIEW

Hunter-gatherer adaptation and resilience: A bioarchaeological perspective

Edited by Daniel H. Temple and Christopher M. Stojanowski

Cambridge: Cambridge University Press. 2019. ISBN 9781107187351. \$99.99 (Hardcover)

A number of influential studies in archaeology (Fisher, Hill, & Feinman, 2009; Folke, 2006; Gunderson & Holling, 2002; Holling & Gunderson, 2002; Hudson, Aoyama, Hoover, & Uchiyama, 2012; McNany & Yoffee, 2009; McNany & Yoffee, 2010; Middleton, 2012; Redman, 2005; Redman & Kinzig, 2003) extended resilience theory as developed in ecology (Holling, 1973) as a theoretical frame for understanding past population resilience (or lack thereof) to external forces of change. Resilience theory has enormous potential for understanding very-long term change in the past, providing a theoretical and interpretive framework for understanding how archaeological sites (and their human remains) might bear witness to episodes of major change that did not result in collapse. However, resilience theory is also an approach with significant methodological challenges. To the best of our knowledge, the authors of this review were the first to marry concepts of resilience in cultural systems to parallel concepts in developmental biology (e.g., homeostasis, canalization). The concept remains under-employed in the study of prehistoric populations, whether through culture or biology, and the volume reviewed here illustrates both the potential and problems of applying resilience theory to understand change in prehistory.

As noted by Jane Buikstra in her final chapter, this book takes North American adaptational bioarchaeology as its point of departure, an approach, that is, associated in many (though not all chapters) with a tendency to emphasize stability over radical change. As the authors of this review have noted (Hoover & Hudson, 2016), persistence of hunter-gatherers is not simply continued existence, or the opposite of collapse. The combination of archaeological evidence for cultural continuity *and* change alongside biological data describing human health during growth and development over time *and* space is powerful. The combined dataset enables researchers to understand when departures from homeostasis occur (interruptions to normal development due to internal and external stimuli) and to interpret acute changes ***s* shaped by larger cultural frames and chronic or even intergenerational changes as shaped by longer cultural processes. For example, populations in transition (e.g., due to climate change, immigration, and migration) may exhibit biological evidence of developmental challenges (inadequate nutrition, disease) and decline in population health that appear to lead to eventual collapse. Yet, those populations may actually be healthy when examined in cultural context—cultural and biological processes that intervene during change may absorb those stresses at the population level. Persistence may appear as radical cultural reorganization,

such as a reorganization of subsistence around a new and more reliable set of resources or the adoption of a new form of subsistence and the resulting changes to material culture or site organization. Ultimately, the casual application of resilience theory to human socio-cultural systems can result in a false dichotomy between sustainability (interpreted as resilience, or lack of change) and collapse (interpreted as lack of resilience, and cultural change). Resilience is a more complex process that involves cycles of change (sometimes radical) as driven by human agency to balance cultural preservation against survival rather than attempts to sustain, wholesale, a past adaptation (Holling, 1973; Holling, 1986; Holling & Gunderson, 2002).

The introduction to what is the first collection of papers on the topic of resilience in bioarchaeology provides a simple overview of resilience theory (intellectual origins and uses in anthropology). It is well written with a good discussion of hunter-gatherer theory and how resilience differs from systems theory. The editors provide an adequate review of how their volume provides a much-needed development of resilience theory applications to bioarchaeology. The introduction serves as a position paper meant to anchor the contributions but, disappointingly, the editors failed to minimize duplication of this content in the subsequent contributions, most of which begin with summaries of what is found here. The editors stop short of their review of resilience theory by not including a discussion of the critiques levied against its applications to human socio-cultural systems (Abel & Stepp, 2003; Cote & Nightingale, 2012). The lack of critical engagement with resilience theory (as opposed to ecological and evolutionary explanations which dominated the field for some time; Abel & Stepp, 2003) is particularly disappointing because translating ecological theory to social systems remains a central challenge across disciplines. Following the introduction, there are 13 chapters that present case studies from a range of geographical locations including Africa (three chapters), the Americas (seven chapters), and Europe, Japan, and Australia (one chapter each). The focus is on hunter-gatherers, although several of the African chapters include pastoralists.

The Cameron and Stock chapter is a stand-out piece that takes a comparative approach to resilience (hunter-gatherers and herders) in Southern Africa via biomechanical markers. By examining the transformation of behavioral activities in hunter-gatherers following the arrival of pastoralists, Cameron and Stock neatly present data and then develop a rich discussion of the cycles of resilience that can be

read in the bones. Ultimately, the authors demonstrate that the persistence of hunter-gatherer lifeways and use of mixed subsistence economies characterize the period of change. Today, mobile hunter-gatherer and pastoralist camps are more likely to overlap than not. Although that overlap may not have been as frequent prior to the space constraints imposed by agriculture and industry, those overlaps occurred and provided opportunities for trade and sharing. The focus of this chapter is on cultural adaptation to changed environments in response to challenges and provides evidence of resilience rather than simply sustainability (without change) of past lifeways. Another chapter on African pastoralism by co-editor Stojanowski (Chapter 9) is also a strong contribution to the volume. Stojanowski has a different take on resilience in African hunter-gatherers. He presents evidence for the maintenance of hunter-gatherer society over time, but one that becomes modified in response to climate change. Specifically, persistence of hunting-gathering lifeways remains at the core of the culture but both a dietary shift and social changes accompanying it are noted as significant buffers to external environmental changes that preclude sole reliance on hunting-gathering across a 5,000-year period. Stojanowski provides robust data that support the interpretation of long-term system buffering with tolerance of some changes and retention of some core values.

Chapter 7 by Da-Gloria and Bueno focuses on early Holocene hunter-gatherers in Brazil. While an interesting contribution, it does not tie together theory and data satisfactorily. The shift to a more mobile lifestyle is argued to be evidence of how descendent populations were maintaining their presence in a changing mid-Holocene landscape that could no longer support larger concentrations of people. There is a missed opportunity to discuss how resilience does not always look as expected. Here, the population structure is rescaled due to resource depletion and that rescaling alters the cultural dynamic and subsistence base. This outcome is stated in the introduction but not fully developed in the discussion of results. Still, this contribution demonstrates that resilience is not simply sustainability. Chapter 3 on Patagonia by Bernal et al. presents an interesting approach using demographic modeling to assess ecological change. Resilience theory is incorporated into the questions asked by the authors but is not fully integrated into the essay.

In Chapter 4, Rick Schulting looks at northwest Europe and the socio-ecological changes associated with the 8,200 BP transition from the Mesolithic to the Neolithic. Given the available archaeological data for this transition, the evidence does not clearly support an argument for or against resilience. For example, Schulting discusses the near abandonment of the west coast of Scotland for a millennium after the 8.2 event, noting that this seems to be a case of loss of resilience because "The time frame seems too long for this to be simply a matter of temporarily readjusting the nature of activities across the landscape" (p. 73). Schulting's chapter is important because it offers a rare, to this volume, incorporation of the concept of linked socio-ecological systems. Schulting draws on archaeological evidence to interpret geographic variation in response to the same environmental challenge and provides an interesting comparative perspective. The approach is so welcome and novel that readers would have benefitted

more from a longer discussion of comparative approaches to studying resilience in linked socio-ecological systems than the primer on resilience theory and stable isotope chemistry. Likewise, Bartelink et al. present a novel application of resilience theory to interpersonal violence in prehistoric hunter-gatherers around the San Francisco Bay area. This is an important topic that pushes the limits of resilience versus adaptation as an explanatory paradigm in anthropology. The authors of the chapter conclude that "indications of heightened violence are likely to result from extreme [social] transformations" (p. 293). This work opens an avenue for further comparative research in the examination of similar cases of extreme social transformation documented in prehistory, such as Neolithic Japan where major social changes have been associated with low levels of violence.

In Chapter 5, co-editor Daniel Temple compares skeletal remains from two Jōmon sites on Japan's Inland Sea. We agree with his basic conclusion that the Jōmon was a very resilient Neolithic culture—our own work has demonstrated resilience and even hunter-gatherer persistence for a very long time in the face of agricultural expansion into Japan (Hoover & Hudson, 2016; Hudson et al., 2013)—but Temple underestimates the extent of social change across the Jōmon period. This may be due to the use of skeletal series that are from old excavations and poorly dated. The lack of direct radiocarbon dates on human remains is a serious challenge to an accurate interpretation of the significance of Jōmon tooth ablation. Temple argues that tooth ablation was an older custom that persisted into the Late/Final Jōmon whereas the standard theory in Japanese archaeology is that it was a new ritual practice that arrived from the continent and became common during the Late Jōmon period onward. Unseating conventional interpretations with robust evidence advances knowledge, but in this case, the lack of confidence in the dating of those sites and materials weakens the evidence supporting the offered interpretation. The opportunity to soften the interpretation in light of the problems with dating and, instead, engage in a discussion on how resilience could be used for both interpretations each with a separate historical significance, is missed. More broadly, the discussion of Jōmon resilience is focused on persistence and fails to incorporate an understanding of cultural change as evidenced in archaeological data on legume cultivation and long-distance interactions with eastern Jōmon and Bronze Age continental Eurasia. This same focus on hunter-gatherer persistence is a theme in several other chapters.


The authors of this review suggest that the absolute maintenance of hunting-gathering lifestyles (dogged persistence in the face of environmental change) is not the hallmark of resilience. Rather, interpreting resilience from archaeological data involves an examination of the challenges faced and how the social system buffered that change. In bioarchaeology, a resilience approach will include an examination of developmental health as shaped by the cultural context. There are a few chapters that fail to do this and are simply bioarchaeology or archaeology research with little to no engagement with the core concept of the edited volume. Merbs' chapter on the Sadlermiut focuses solely on collapse with no reference to resilience at all. The same tendency is reflected in Littleton's contribution, which concludes that Aboriginal Australians in the Western Riverina region collapsed due to violence and dispossession of European colonialism rather than

presenting evidence that indicates an end to that socio-cultural system. Yet, Aboriginal people and their cultures persisted within that system and that entire topic raises thorny political and moral questions over how we understand Indigenous peoples in the modern world.

The concluding comments by Buikstra, while sometimes a bit off topic, walk the reader through the intellectual history of approaches taken in bioarchaeological research and consider what a resilience approach within bioarchaeology might look like. Buikstra has had a long and influential career in bioarchaeology but has not engaged in resilience theory approaches to bioarchaeology. As such, her assignment to this chapter was a daring but commendable choice. Her grappling with how resilience might fit into the intellectual history of the discipline and be useful as a theoretical tool provides the bioarchaeological reader unfamiliar with resilience an engaging intellectual journey to understanding. Indeed, her journey leads to an incisive list of the problems involved in using resilience theory in bioarchaeology in Table 15.1—something these reviewers had expected to see in the introduction and were happy to find here.

Archaeological evidence, especially in earlier prehistory, is rarely fine-grained enough to develop convincing analyses of long-term change within adaptive cycles. This is a challenge we outlined in an earlier paper on understanding archaeology and climate change (Hudson et al., 2012). Yet it should be noted that the overall approach of this book is not to develop textbook examples of resilience theory within bioarchaeology nor to provide critiques of it. Perhaps greater editorial oversight across chapter formats would have reduced the repeated primer on resilience that appears at the start of many chapters and allowed authors to specifically apply the theory to their data rather than talk about the theory generally. As it is, the authors have each attempted to present their own views on how well or how poorly resilience theory may be applied to interpreting prehistory. Given that the authors have somewhat variable understandings of resilience theory, the result is mixed and readers would have benefited from a final editorial chapter synthesizing the conclusions with a road map on where to go next. Without this, the book is more a proving ground than a model for research on when and how a resilience theory of bioarchaeology might best be applied. The book is handsomely produced by Cambridge University Press although it contains a few rather glaring errors, notably “chord-impressed” (p. 86) and “*Castanea hansaibai*” (p. 88) and confusing terminology, notably “after Neolithization [sic]” (p. 11) and the use of the term “contact” without further explanation (p. 85).

Hunter-gatherer Adaptation and Resilience brings together a wide range of new and old bioarchaeological data and their interpretation with varyingly successful applications of resilience theory. It will be of interest to many readers for that reason—a starting place to think about how resilience can be developed in bioarchaeological research more broadly. The question of to what extent resilience theory can and will be adopted by the field of bioarchaeology, as explored in this volume, remains open.

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REFERENCES

- Abel, T., & Stepp, J. R. (2003). A new ecosystems ecology for anthropology. *Conservation Ecology*, 7(3), 12.
- Cote, M., & Nightingale, A. J. (2012). Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research. *Progress in Human Geography*, 36(4), 475–489.
- Fisher, C. T., Hill, J. B., & Feinman, G. M. (Eds.). (2009). *The archaeology of environmental change: Socionatural legacies of degradation and resilience*. Tucson: University of Arizona Press.
- Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change*, 16(3), 253–267.
- Gunderson, L. H., & Holling, C. S. (Eds.). (2002). *Panarchy: Understanding transformations in human and natural systems*. Washington, DC: Island Press.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4, 1–23.
- Holling, C. S. (1986). Resilience of ecosystems: Local surprise and global change. In W. C. Clark & R. E. Munn (Eds.), *Sustainable development of the biosphere* (pp. 292–317). Cambridge, MA: Cambridge University Press.
- Holling, C. S., & Gunderson, L. H. (2002). Resilience and adaptive cycles. In L. H. Gunderson & C. S. Holling (Eds.), *Panarchy: Understanding transformations in human and natural systems*. Washington, DC: Island Press.
- Hoover, K. C., & Hudson, M. J. (2016). Resilience in prehistoric persistent hunter-gatherers in northwest Kyushu, Japan as assessed by population health and archaeological evidence. *Quaternary International*, 405, Part B: 22–33.
- Hudson, M. J., Aoyama, M., Hoover, K. C., & Uchiyama, J. (2012). Prospects and challenges for an archaeology of global climate change. *WIREs Clim Change*, 3, 313–328.
- Hudson, M., Aoyama, M., & Hoover, K. (2013). *Navigating hunter-gatherer resilience: networks and insularity in the prehistory of the Ryukyu Islands*. *Mémoires de la Société Finno-Ougrienne* [Special Edition of the Finno-Hungarian Society Journal] 265:49–66.
- McAnany, P. A., & Yoffee, N. (Eds.). (2009). *Questioning collapse: Human resilience, ecological vulnerability, and the aftermath of empire*. Cambridge, MA: Cambridge University Press.
- McAnany, P. A., & Yoffee, N. (2010). Questioning how different societies respond to crises. *Nature*, 464(7291), 977.
- Middleton, G. D. (2012). Nothing lasts forever: Environmental discourses on the collapse of past societies. *Journal of Archaeological Research*, 20, 257–308.
- Redman, C. L. (2005). Resilience theory in archaeology. *American Anthropologist*, 107(1), 70–77.
- Redman, C. L., & Kinzig, A. P. (2003). Resilience of past landscapes: Resilience theory, society, and the longue Durée. *Ecology and Society*, 7(1), 14. Retrieved from <http://www.consecol.org/vol7/iss1/art14/>