

Book review for *Quarterly Review of Biology*

***From Colonization to Domestication. Population, Environment and the Origins of Agriculture in Eastern North America.* By D. Shane Miller. University of Utah Press, Salt Lake City, 2018. ISBN 9781607816164. 198 pages. \$55**

This book is not about plant domestication *per se*, but it does contribute to understanding how plant domestication fits into a longer-term adaptation history of human populations in eastern North America. Instead of archaeobotanical evidence, this book is focused on projectile points as representative of human hunting strategies and settlement distributions as representative of past human populations and both of these are placed against the background of climatic and vegetation changes. This book addresses the hypothesis that changing human demography and climate drove populations in eastern North America to become cultivators of plants, leading to the domestication of an indigenous package of native small-seeded taxa, as well as sunflowers. Through carefully reasoned and statistical analyses of lithic technology and settlement patterns, in particular from the intensively documented Duck River valley in Tennessee, the author develops a model of long-term boom and bust cycles in human population in which the shift to cultivated plants in the Late Archaic Period represents an adaptive response to imbalances between rising population and environmental change (cooling with reduction in oak-hickory forests). This argument represents a sustained critique of the “floodplain weed” hypothesis of Bruce Smith (*Rivers of Change*, Smithsonian Press, 1992), which has long dominated discussions of the transition to cultivation in North America. The alternative proposed by Miller is that hunter-gatherers, near carrying capacity, were faced declining returns from hunting, with more effort expended on small game, and declining returns from tree nuts and that they shifted towards more r-selected and storable small-seeded species, and their cultivation was therefore an adaptive response that can be understood through predictions of Optimal Foraging Theory.

The author is interested in the big picture, how from a Late Pleistocene peopling North America came to both highly populated and to support food producing communities, but the author is also attuned to the particular details of lithic technologies, regional archaeological datasets and the use of statistical tests of correlation. To get to point of this book one needs to hang on through most of the ~150 pages. Its opening chapters do not provide a particularly up-to-date or compelling overview on plant domestication as an evolutionary process or the origins of agriculture, either in North America or elsewhere. Instead the domestication of North American plant represents a finish line for the journey of adaptations that Miller traces through his analysis. Nevertheless, the summary of climatic driven vegetation changes and shifts in lithic tool kits in eastern North America is detailed and synthetic. Predicted correlations between broad spectrum hunting and lithics are tested first on a case study from prehistoric Australia before being deployed in Tennessee. The conclusions demonstrate both the usefulness of carefully a reasoned statistical approach to archaeological data, and place a transition to agriculture at the end of a much longer trajectory of adaptation history. Whether behavioural ecology will really revolutionize our understanding of plant domestication must await the application of similar approach to more regional cases of emergence of cultivation.

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