

 PROFILE

Profile of Clark Spencer Larsen

Jennifer Viegas, *Science Writer*

The Ohio State University biological anthropologist Clark Spencer Larsen has conducted pioneering research on biocultural adaptation that occurred during the last 10,000 years of human evolution. He was among the first to apply multidisciplinary approaches to the study of temporal trends in diet, health, mobility, and interpersonal conflict. Elected to the National Academy of Sciences (NAS) in 2016, Larsen was part of a 25-year project at Çatalhöyük, a site in south-central Turkey that was continuously occupied for more than 1,150 years (7100–5950 BC). Larsen's Inaugural Article (1) synthesizes his team's bioarchaeological findings. These findings shed light on how early farming affected Çatalhöyük's Neolithic societies and others, with impacts continuing to the present.

National Monument Sparks Interest in Archaeology

Larsen grew up in Beatrice, Nebraska. Near this town is the national monument and associated museum for the initial homestead following President Abraham Lincoln's signing of the Homestead Act of 1863. "In my family's first of many visits to the Homestead National Monument, my parents, Leon and Patricia Larsen, showed me artifacts associated with early pioneer settlement," Larsen says. "As an 8-year-old, I was enthralled with what I was seeing. Ever since, I have continued to be interested in earlier people, especially those documented and interpreted by archaeologists and paleontologists." By his early teens, Larsen decided that archaeology was to be his life's work.

Larsen's mother facilitated a meeting at their home with late archaeologist R. Clark Mallam, who was teaching at the University of Nebraska. He advised Larsen to get fieldwork experience and to apply to Kansas State University (KSU). Larsen followed Mallam's guidance. Days after graduating from Beatrice Senior High School, Larsen worked on an excavation project at Nebraska's Fort Atkinson before attending KSU.

Mentors Instrumental to Early Training

As a KSU freshman, Larsen took a human osteology course taught by biological anthropologist William M.

Bass. "His demanding course turned out to be a watershed event for me, having captured my interest in archaeological human skeletal remains and what they tell us about the past," Larsen says. Bass recommended him for a Smithsonian Institution-sponsored excavation project involving anthropologists Douglas Ubelaker and late NAS member T. Dale Stewart.

Larsen says, "The experience was amazing and challenging, contributing to my interest in the study of human remains from archaeological settings, a field now known as bioarchaeology."

Larsen next attended the University of Michigan, graduating with a doctorate in biological anthropology in 1980. During Larsen's first year as a Master's student, David Hurst Thomas of the American Museum of Natural History recruited Larsen to serve as biological anthropologist for the St. Catherines Island Archaeology Project located at the southeastern United States Atlantic coastline. The work formed the basis of Larsen's doctoral dissertation concerning the impacts of the foraging-to-farming transition on health and lifestyle (2). Larsen determined that these effects included reduced physical activity, a rise in infectious disease tied to population growth, skeletal size reductions, and an increase in dental caries attributed to a growing reliance on domesticated maize.

Engineering Theory Applied to Bioarchaeology

Shortly before earning his doctorate, Larsen accepted the position of assistant professor of anthropology at the University of Massachusetts, Dartmouth in 1979, followed by assistant and associate professorships at Northern Illinois University. At the same time, he continued research on St. Catherines Island. Examining the evidence for dental caries, Larsen determined that the frequency of carious lesions among the island's residents was more marked in females than males, with the disparity resulting from probable subsistence role differences between the sexes (3).



Clark Spencer Larsen. Image courtesy of John Nixon (photographer).

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At the American Association of Physical Anthropologists annual meeting in 1980, Larsen met with anthropologist Christopher Ruff of The Johns Hopkins University School of Medicine to discuss his interest in applying engineering theory and cross-sectional geometric analysis to the study of human skeletal remains. Together with colleague Wilson Hayes, Larsen and Ruff subsequently accomplished this feat while investigating adult leg bones from the St. Catherines' project (4). The research revealed a decline in workload and mobility with the adoption of a farming-based subsistence economy. For this and prior achievements, in 1984 Larsen was elected as a member of Sigma Xi: The Scientific Research Honor Society.

Signatures of Human Dietary Change

In 1989 Larsen went to Purdue University, having accepted an associate professorship in the university's department of anthropology. Two years later, he became a full professor before moving to the University of North Carolina, Chapel Hill, where he rose through the ranks to Amos Hawley Distinguished Professor in 1999. Additionally, Larsen served as president of the American Association of Physical Anthropologists.

Continuing his active research program, in 1992 Larsen led one of the earliest regional analyses of archaeological human remains to document the shift in diet from foraging to maize farming (5). With collaborator Margaret Schoeninger, then of the University of Wisconsin, Larsen and his team measured carbon and nitrogen stable isotope ratios in bone collagen dating to 1150–1300 from coastal southeastern Georgia. The measurements revealed a decrease in consumption of marine resources and increased reliance on maize. Larsen and his team, however, found that the population consumed fewer carbohydrates from 1300 to 1450, likely due to environmental stress and associated reduced crop yield.

The researchers theorized that reduced dietary breadth during the Mission Period (1568–1684) contributed to the reduction of Georgia coastal Native American peoples in the 17th century. Larsen presented reviews of studies on agriculture-associated biological changes in this and other populations worldwide in papers published in 1995 (6) and 2003 (7). He linked adoption of agriculture to craniofacial and dental alterations as well as to an overall decline in oral and general health.

La Florida Bioarchaeology Project

In 1982 Larsen initiated the La Florida Bioarchaeology Project, a 40-year interdisciplinary research program focused on health and lifestyle impacts of colonization and agricultural intensification on Florida's native populations from the 16th to the early 18th centuries. A synthesis of the project in a 2001 book edited by Larsen concluded that Native American health was declining before and during Spanish contact, not only in the North American Southeast, but also in the North American Southwest, due to similar circumstances involving Spanish colonization in both regions (8).

A summary of the La Florida project, also published in 2001, underscored that postcolonization Florida native groups experienced some of the most dramatic alterations in health and lifestyle in the New World (9). The authors wrote: "These changes include a general deterioration in health that began before European contact and missionization, but that were exacerbated by changes in diet, settlement, work practices and other consequences of exploitation and colonization of the region by Spain." The researchers used bioarchaeology to document a sharp increase in osteoarthritis prevalence among native individuals during the Mission Period that coincides with the Spanish colonizers' draft labor system.

Seminal Textbooks, Teaching

In 2001, Larsen moved to The Ohio State University to become chair of the department of anthropology, where he also served as a distinguished professor of social and behavioral sciences. That same year he began work as editor-in-chief of the *American Journal of Physical Anthropology*. For his accomplishments, Larsen was named a fellow of the American Association for the Advancement of Science (2006) and received the American Association of Physical Anthropologists' Gabriel W. Lasker Award (2008). In 2017, Larsen accepted his current position as an Ohio State University distinguished university professor of anthropology.

Teaching remains central to his work. Larsen says, "It is in this capacity that I get to share with students new advances in my field and why it is important to know how we humans got to where we are today and the long evolutionary route from earliest human-like ancestors living 6–7 million years ago to the present." He has mentored hundreds of students and has guided their careers. Larsen has also contributed to several seminal books in his field. They include *Bioarchaeology: Interpreting Behavior from the Human Skeleton* (author) (10), *The Backbone of Europe: Health, Diet, Work and Violence Over Two Millennia* (coeditor) (11), and the textbook, *Our Origins: Discovering Biological Anthropology* (author), for which he is now preparing the fifth edition (12).

Bioarchaeology of the Çatalhöyük Project

When Larsen was completing the first phase of the Georgia coast research in the early 2000s, Stanford University archaeologist Ian Hodder invited him to join as a leader of the bioarchaeology component of Hodder's Çatalhöyük Project in south-central Turkey. Larsen says, "My interest was captured when he told me about the comprehensive nature of the project, involving an impressive suite of archaeology specialties, ranging from study of plant and animal remains, housing, climate, and many other areas [and] providing essential context for understanding life in this important Neolithic setting." The 25-year fieldwork project recently concluded, but study of the artifacts and skeletal remains continues. Larsen and his colleagues summarize the work at Çatalhöyük in his Inaugural Article (1).

To document and interpret the site's Neolithic archaeological record, Larsen and collaborators used a

range of tools that included carbon and nitrogen stable isotope analysis for dietary reconstruction, engineering theory for reconstructing activity and workload patterns from arm and leg bones, and microscopic and macroscopic analysis of teeth for identifying growth arrest and patterns of physiological stress. The researchers found that greater reliance on domesticated plants and animals led to heightened fertility and birthrate.

However, Larsen says, "The changes in living conditions resulted in increased risk of mortality, challenges to health, increased workload travel demands, and presence of interpersonal violence involving community members." He adds, "The insights into the general trend of expansion of human population beginning in the Neolithic presents a snapshot of the roots of a fundamental demographic transition—especially population increase—that continues to the present and will continue for the foreseeable future."

Global History of Health Project, Return to Georgia

Larsen recently concluded his role as codirector of the Global History of Health Project (1999–2019). Established in 2001, the ambitious project has resulted in North American and European modules that include large databases centralizing extensive skeletal information used to track human health trends. Larsen is now helping to establish an Asian module.

Coming full circle, Larsen has returned to the site of his original research: the Georgia coast. There, he is studying a key transition period between late prehistory and native populations' early European contact. "My fascination with early human settlements, which began in childhood, has not diminished," he says. "I particularly value my collaborative work in the field and lab, including with my students. Watching them learn is a daily thrill for me."

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