

Hey squash, time for your close-up: Plants 'auditioned' before domestication

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Photo: Jon Chase/Harvard Staff Photographer

Humans likely 'auditioned' plants and animals that they eventually domesticated by first managing wild populations during a long transition period — sometimes thousands of years — that led from hunting-gathering to farming lifestyles, a speaker at the Harvard Museum of Natural History (HMNH) said Thursday (Feb. 18).

Bruce Smith, an authority on the rise of eastern North American agriculture and the curator of North American archaeology at the Smithsonian National Museum of Natural History in Washington, described current thinking on the rise of agriculture, one of the major changes in human history that created the modern world.

Scientists believe there were roughly a dozen places where agriculture arose independently through the [domestication](#) of plants and animals. Some species — such as cattle and pigs — were domesticated

independently from wild stock in more than one place at different times, he said.

Smith spoke at the Harvard Museum of Natural History as part of its “Food for Thought” lecture series, which examines the past, present, and future of our food supply and runs into this spring. Elisabeth Werby, the HMNH executive director, introduced Smith, while Noel Michele Holbrook, Bullard Professor of Forestry, moderated the event, fielding audience queries during a question-and-answer session.

Agriculture is a relatively recent development in human history, with the earliest traces found about 10,000 years ago. Despite that late arrival, agriculture has had a dramatic impact on human society, supporting larger, stable populations and the development of urban centers.

Scientists have established discrete dates for plant and animal domestication at various locations around the world, ranging from about 10,000 years ago for squash domestication in Mesoamerica and wheat domestication in the Middle East to 4,800 years ago for sunflower domestication in eastern North America and 2,000 years ago for rice in sub-Saharan Africa. Other locations where agriculture is thought to have arisen independently include South America, East Asia, and New Guinea. But Smith said those dates may give the impression that domestication was a before-and-after kind of event, with hunter-gatherers before and farmers afterward. The reality, he said, was likely far more complex.

There’s a large gray area between “wild” and “domesticated” plants and animals, Smith said. Humans likely managed wild populations of everything from nuts to berries to clams by manipulating the wild environment to foster the success of food sources important to them without actually domesticating them. He cited cases of burning forest canopy trees to foster growth of sun-loving food plants below and

building rock walls at the low-tide mark to foster sand accumulation and improve the environment for clams.

Species that were successfully domesticated had key characteristics, he said. Plants tended to be early-succession species that did well in disturbed environments that humans could create for them. The animals tended to be naturals for domestication — less skittish and easily led. Dogs and cats are an exception to that rule, Smith said, since they took a “let’s make a deal” approach of mutual benefit.

Even after the first plants were domesticated — illustrated in the archaeological record by larger seed sizes when compared to wild progenitor species — true agricultural societies took time to develop. Smith defined agricultural societies as those that got 60 percent of their food from domesticated plants and [animals](#). Reaching that level, he said, took thousands of years. While the first evidence of squash domestication in Mesoamerica came 10,000 years ago, the first remains of an agricultural village only dates to 4,000 years back, indicating a 6,000-year transition period to agricultural living. While Smith acknowledged that future archaeological finds may shift those dates, he said that, even if they do shift, it seems likely there was a long transition between the first plant domestication and the development of settled villages dependent on farming as a lifestyle.

Most research on the roots of agriculture is focused on the initial transition where the first [plants](#) were domesticated, Smith said, leaving ample room for future researchers to investigate the long transition afterward.

Provided by Harvard University

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