Alan Farahani — ORIAS Summer Institute 2014

"Agricultural Production in the Ancient Near East in the Last 7,000 Years: Theories and Methods"

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Summarized by Stephen Pitcher

An investigation of the topic of agricultural production serves as something of a wake-up call. It is an undeniably important part of the complex issue of foodways, but it does not command the attention its crucial role in the future of humanity would seem to warrant. 7,000 years ago is a very recent moment in time to Dr. Farahani's discipline of paleoethnobotany. Agriculture had yet to become the dominant (although by no means exclusive) form of food production it is today; hunting and gathering—a simple term encoding a complex way of life—was another prominent means of accomplishing that goal. But ensuing millennia found humanity increasingly dependent on, and the earth increasingly given over to, agriculture—described by Agricultural Ecologist John Vandermeer as "a contract for people to provide for one another, using seeds and harvests to do so."

It is this "contract" and its ramifications that make agriculture such a riveting focus for study, for it is through agriculture that people's everyday lives, past and present, are caught up in a nexus of human society; plants and non-human animals; the climate and the geology of our diverse environments; and the soil and water that nurture all life. Dr. Farahani pointed to the politics of the Central Valley as a contemporary illustration of this nexus in action, then showed a slide of the ca. 8000 BCE archaeological site of Jerf El Ahmar, in modern-day Syria, where evidence of ceremonial rites and the remains of storage structures attest to the "ripple effect" throughout social behaviors and procedures caused by the development of agriculture. It is unique to this part of the world—which Farahani calls Southwest Asia, in preference to the vague (and heavily laden) terms "Middle" or "Near" East—that agriculture served as the dominant mode of food production from around 7,000 BCE almost to the present, preceding and overlapping such key transitions as urbanization, the development of writing, and the arrival of several major religions.

A clarification of the terms "cultivation" (the assistance of plants in their propagation and reproduction and hence increasing plant fitness), "domestication" (the continual selection of traits in plant "cultivars" through multiple successive generations), and "agriculture" (systematic and continuous human cultivation, harvesting, storage, and careful and conscious propagation of domesticated plant varieties) followed. Dr. Farahani rejected the concept of "control" with respect to agriculture, as it violates the laws of thermodynamics: humans create proper conditions for plants to propagate, *assisting*—not dominating or controlling—reproduction.

Cultivation alters some aspects of plant morphology, notably loss of seed dispersal and grain dispersal aids and the crucial increase in grain size; it also alters aspects of human society. Such tasks as planting, harvesting, threshing, winnowing, and storage require

new social structures, which are longstanding and have widespread influence, observable even in current language.

With the expansion of agriculture throughout the “fertile crescent” (another term Farahani dislikes) and over the Mediterranean basin came a synchronous spread of animal domestication, reflecting agricultural notions of selective propagation. Contrary to the prevailing narrative of Southwest Asia’s leading role in the birth of agriculture, however, there were multiple centers worldwide of plant domestication. Dr. Farahani showed a map depicting ancient agricultural centers in the Americas, Africa, East Asia, and Southwest Asia and the crops with which they were associated. (Sadly for pedigree-conscious aficionados of the cuisines of France and California, neither region is featured on such maps.) The means by which such data are unearthed are collectively termed Environmental Archaeology, a potpourri of several disciplines and sub-disciplines of archaeology which aim to uncover the ecology of human communities. Dr. Farahani’s field of paleoethnobotany (PEB), one of these disciplines, is an outgrowth of the European pursuit known as archaeobotany, which focused on plants alone, exclusive of their interaction—culinary, ceremonial, or otherwise—with humans. According to Farahani, probing into past cultures’ interactions with the plant world is a fascinating pursuit, requiring enormous patience and involving a great deal of diving into heaps of cow dung (among other methodologies). PEB research begins with a specific question, to which an all-important research design—encompassing the analysis of patterns of deposition and preservation; the collection and processing of remains; the identification, classification, quantification, measurement, testing, and ultimately interpretation of data—seeks to provide the answer. The principal tools of this quest are the methodologies of macrobotany, anthracology, microbotany, palynology, and isotope mass spectrometry.

Dr. Farahani spoke somewhat poignantly of the inequalities of ethnobotanical research: the period from 7000 to 8000 years ago is currently “trending” in the field, attracting lavish research funds, while there’s a comparative lack of interest, and consequently of data, concerning the past 5000 years, with the most recent 800 years (of special interest to him) undergoing particular neglect. Then there is the case of the natural endowments of Egypt, which is in a league of its own in terms of the wealth of its remains, due to its matchless aridity. Yet even in less archaeologically blessed regions, ethnobotanical methods produce substantial results. Macrobotanical remains, like carbonized wheat seeds or dessicated garlic, contain much information—in the case of a burnt wheat seed, for instance, about fire intensity (exploding starch probably indicates a covered cooking environment), soil properties, accidental trampling, and other details evoking the daily life of the past. The macrobotanical research technique of flotation—practically nonexistent prior to 1970—transformed the field of archaeobotany, among other things reversing the prevailing “core” hypothesis of an inexorable diffusion of agriculture out of the so-called “Fertile Crescent.”

Anthracology entails the study of archaeological charcoal and fresh wood remains; microbotanical methods like high-power microscopy can be used to investigate phytoliths (silicates retaining the shape of the plants in which they were formed long after the plants themselves have decomposed), starches, dental calculus, and coprolites (fossilized feces); and palynology involves the extraction of pollen, primarily from alluvial environments.

Using all these techniques, it is possible to gain a fairly representative picture of how humans have cultivated and used plants.

Dr. Farahani concluded by describing a case study of two moments in the history of Dhiban, a Levantine plateau successively occupied by humans since the commencement of agriculture. Using the same methodologies as someone studying agriculture 8000 years ago, Farahani attempted to ascertain the effects of political regimes on the type of agricultural practiced in the periods 430–686 CE, under the Byzantine Empire, and 1261–1436 CE, under the Middle Islamic Mamluk Empire: would one see changes through time, or were timeless paradigms to be observed? Patiently testing what he termed the "boundaries of his inner Zen," Farahani collected 903 bags of dirt—2,600 liters of dirt comprising 223 samples and 68,295 kinds of objects. The abundance of charcoal suggested that the region supported considerably more vegetation in the past than it does in the practically treeless present (extrapolating from a current landscape can be *very* misleading). Ultimately a picture emerged of a progression from a Byzantine culture whose agricultural production focused on arboriculture to a Middle Islamic culture more focused on cereal cultivation, with a continuum of crops to weeds observable in the earlier samples and a greater proportion of chaff in the later samples. Variety versus concentration evolved as well: half of the earlier samples contained at least one seed of various types, a percentage that dropped dramatically later while concentrations of barley and wheat jumped almost 100 percent. The work of interpretation focused on what a shift in production strategy from things like grapes to things like cereal implied about changes in landscape, social organization, and polity. Such discoveries as the presence of grape skins with seeds embedded in them—the dregs of wine?—in the earlier remains, and cherry pits—from where?—in the later speak to aspects of these people's lives not touched on by written history.

Q&A

Participant: What do you think we're going to find in [the study of] the last 800 years?
Farahani: The post-Contact exchange of plants is fascinating. For instance, smoking is common, but tobacco is a staple New World crop: how did it become indigenized into local traditions? You'd expect to find tobacco seeds; also, especially in the last 400 years, tomato and watermelon, evidence of Columbian Exchange; not so much evidence of potatoes.

Participant: Was ethnic identity in Dhiban constant over the years, or did the ethnic/linguistic identity change over the period?
Farahani: My hypothesis is that almost certainly it has changed. Direct evidence for that change is still being looked for, but there's no question that in the earlier period people probably spoke some Greek, some semitic (an early form of Arabic). The site is famous for a stela from 850 BCE which corroborates information in the Hebrew bible, written in a language close to biblical Hebrew.

Participant: You'd expect different ethnic groups to eat different things.
Farahani: Definitely a hypothesis we're examining. Sometimes different ethnic groups eat different things, sometimes within the same area there's an exchange of cuisines, and

they eat the same things. We looked more at a political economy comparison than at cuisine.

Participant: One slide looked as if it contained all remnants from the Byzantine period; politically, what could explain that?
Farahani: The short story is that in the early Byzantine palynology, there is evidence of a huge spike in olive production, that then tapers off; but the problem with pollen is that it shows an aggregate picture—it flies around in the air and then settles down *mixed:* ambient pollen is difficult to disentangle, to figure out where it's from. There was only one olive pit in the Byzantine area, but others nearby had lots of olive pits. Farahani's site had lots of grape and wine storage. So individual communities differ, perhaps specializing. That's why it's important to use different methods: the pollen count shows olives, but one site has olives while another, thirty kilometers away, has no olives. Olioculture's very important in the region now.

Participant: We eat "Persian melons" here, and in India it is said that olives and raisins come from this area [Jordan].
Farahani: Marketing today uses a sense of gastronomic heritage, taking advantage of the longevity and cultural meaning of these plants to people—talking about "Inca chocolate" (the Incas didn't use chocolate; it's a Mesoamerican product). A lot of plants are associated with certain areas—tomatoes with Italy, for example. Apricots, maybe apples, come from Central Asia, pomegranates from the Iranian plateau and peaches probably, and plums. Bananas were domesticated in New Guinea—which is not what we think of—and peanuts in Amazonia. So the cultural, popular meanings given food plants [don't necessarily accord with ethnobotanical evidence].

Participant: What was your path to becoming an ethnobotanist? A lot of our kids in science classes are sitting there going, [ruefully] "Why are we here?"
Farahani: Yeah, PEB is a hard sell. Even fifteen years later when they're college students, it [the attitude toward science] doesn't get any better. I became interested in PEB in college. I started out with linguistics, then got into archaeology in undergraduate school, then in graduate school more into agriculture as a way of life. It's sitting at the nexus of different facets, such a *fruitful* area of research. Berkeley is one of the few places in the United States studying this. A class in Environmental Archaeology changed my focus, and there were other, ambient stimuli—concerns with sustainability, environmental concerns. It is so critical to investigate [these issues] and *inform* the next generation. The reality has become a bit distressing; there's a push from Congress to cut funding such as what I received because it's "not in the national interest." So the longevity of niche disciplines like mine is up in the air.

There's a discipline for everybody. I always liked science and history, and I found something that combined the two—something that is right now possible. Encouraging the next generation to become interested in these issues is really important—important for everybody.