

**ORIGINS OF AGRICULTURE IN CHINA**

**The Evidence for Indigenous Development**

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The earliest evidence of an agricultural economy is found in the Levantine corridor of the Near East, dated to 10,000 B.P. In China, the earliest known farming settlement is Peng-tou-shan, in the Hubei basin of S. China, dated to 8400 to 7800 B.P. (Smith 1995 and Fagan 1992). Although the archaeological record indicates that agriculture was being practiced 1500 years earlier in the Near East than in China, I believe that the domestication of plants and animals developed independently in China. The untenable logic of diffusion theory and the presence of the wild progenitors of the domesticated species of plants in early Neolithic China strongly support the indigenous development of agriculture.

Diffusion theory, in the context of the West's influence on the East, is espoused or acknowledged in texts of fairly recent publication. In *The Origins of Civilization*, C. L. Riley states:

Both the cultivated grain and the domesticated animals of early China are almost certainly from the West. The idea of pottery making (aside from any connections with specific wares) and of the bow and arrow is also probably Western. It is almost beyond question that agriculture and animal husbandry, spreading from Mesopotamia to Iran and Turkistan by slow stages of diffusion, eventually reached western China. From there, via the Yellow River, they gradually infiltrated to the coastal plain. It is not clear why millet should have been the popular cereal grain unless, as suggested earlier, it had gradually replaced the less adaptable wheat on the long slow journey across Central Asia (Riley 1969).

And as recently as 1984, Francesca Bray, in *Science and Civilization in China*, refers to the 'current prevalence of diffusion theory' (Bray 1984). There are several logistical problems, however, with the diffusion theory: the mechanism of transference, the time/space sequence, and a lack of corresponding evidence that identifies distinctive common origin.

Since the earliest known agricultural sites outside of the Near East are in North China, P'ei-li-kang (7500 to 7200 B.P.), and in South China, the aforementioned Peng-tou-shan, the later-dated sites of rice agriculture in India (3500 B.P.) and in S.E. Asia (5000-4500 B.P.) preclude the theory that the idea and technology of farming reached China through a southerly route. The diffusion of agriculture *within* the Near East *is* a viable theory since, through the trade of obsidian, a far-reaching network of communication had been established, facilitating the exchange of ideas and technology as well as commodities. There is, however, no evidence of trade between the Near East and China during the Neolithic period. Furthermore, agriculture did not even develop in the Mesopotamian plain until approximately 7000 B.P. (Fagan 1992), at which time it was already

established in both North and South China. Certainly diffusion from the Levant would have reached the Tigris-Euphrates river region earlier than the Yangtze and Yellow river regions.

Nor does Riley's hypothesis of diffusion through western China seem plausible in consideration of the geographical barriers presented by the vast mountainous terrain that separates China from the Fertile Crescent and of the sheer physical distance of approximately 4500 miles (between present-day Damascus and Beijing). And while the climate of the northern regions was warmer and wetter in the early Holocene than it is now, the terrain north of China was still comparably more arid and perhaps equally inhospitable.

Even if one postulates there was some movement of people from west to east who did make contact and were able to communicate with the indigenous people of China, they would presumably be hunter-gatherers, not farmers. Therefore, they would not bring with them ideas of pottery making or the technology of agriculture. The only possibility of such a scenario would be the diffusion of their knowledge of animal husbandry. It is conceivable that an early nomadic people existed who may have followed herds across the steppes, eventually culling and domesticating animals from the wild. According to Charles Redman, the domestication of animals usually predated the domestication of plants (Redman 1978). Nevertheless, there is no evidence that such an interaction did occur during this time.

The problem of the space and time sequence in diffusion is due, in part, to a hiatus in the archaeological record. The earliest identified Neolithic site in China, Peng-tou-shan, is one in which agriculture is already well-established. Evidence recovered from that site thus far reveals that it was a large, permanent village occupied over a long period of time whose occupants cultivated a domesticated rice (Smith 1995). All of the agricultural settlements in China excavated to date are similar in that they represent a later phase of development. There are no sites that date to the period of incipient agriculture that would identify the initial stage of transition from hunter-gatherer society. Plant and animal remains consistently include domesticated species in addition to wild species, indicating that people continued to rely on hunting and gathering even past the early phases in the development of farming.

This hiatus raises the question of how early the origins of agriculture were in China. The presence of domesticated species of plants and animals implies an added calculation of time for

selective pressure to effect morphological changes. Charles Redman discusses these processes with respect to domestication of animals:

According to modern experiments, well-defined morphological changes do not occur before about thirty generations (Bokonyi 1976). Because the length of a generation is from 2 to 3 years for small species such as dogs, sheep, goats, and pigs and from 5 to 6 years for larger species such as cattle, one could expect to detect morphological changes in bones dating from 50 to 200 years after domestication began (Redman 1978).

And in *The Emergence of Agriculture*, Bruce Smith cites research into the domestication of cereal grains that estimates three centuries as sufficient time for morphological changes to occur (Smith 1995).

All of these factors considered together effectively diminish the period of time between the Near East and China with regard to the emergence of agriculture and thus further reduce the possibility of diffusion.

In contrast to the diffusion theory, the indigenous development theory of agriculture in China corresponds better to the evidence. Agricultural societies derived from hunter-gatherer societies. Through the exploitation of their environment, hunter-gatherers became very knowledgeable about the characteristics and life cycles (and thus the potential) of the plants and animals that comprised their diet. That intimate familiarity, acquired over a long period of time, preadapted the hunter-gatherers to agricultural practices. With the end of the Pleistocene, climatic amelioration increased the availability of water, the growth of vegetation, and the population of animals. It was under such circumstances of diverse, plentiful resources that plant domestication was most likely to originate, according to Sauer (Bray 1984). Experimentation could be conducted without risk to primary food sources.

The preconditions for agriculture, according to Robert Braidwood's hypothesis, are a favorable environment, a sufficient level of cultural development, and the presence of potential domesticates, animals and plants, in their natural habitat (Redman 1978 and Smith 1995). Braidwood applied his theory to research in the Near East with successful results, but his methodology has since been incorporated into the research of other regions, including China.

Two distinct agricultural economies developed independently in China, centered on very different crops: millet in the North and rice in the South. Several historians (Chang, Fagan, and Hui-Lin Li) concur that the wild progenitors of both plants were indigenous to each of the regions

where they were domesticated. Bruce Smith, though he also subscribes to the theory, appears more cautious and discusses the difficulty of accurately identifying the progenitor species of rice and broomcorn millet (according to Smith, the ancestor of foxtail millet has been identified in China). He explains that the multitude of wild species that have developed since domestication have obscured the evidence and complicated the process of identification. But Smith concludes that there is strong evidence that the Yangtze was “within the geographical range of wild rice” (Smith 1995). And according to Hui-Lin Li in *The Origins of Chinese Civilization*, “no clear indications of any importation of crops or other outside influence have yet been documented” (Hui-Lin Li in Keightley).

In summary, there is no reliable evidence to support the diffusionist theory of agricultural origins in China. Conversely, the progress in identifying progenitor species of millet and rice provides compelling evidence that agriculture was an indigenous development. Although a great deal more archaeological research remains to be done, the evidence at present refutes diffusionist theory.

## References

American Museum of Natural History. *People of the Stone Age: Hunter-gatherers and Early Farmers*. New York: HarperCollins, 1993.

Bray, Francesca. *Science and Civilization in China*. vol. 6, Biology and Biological Technology, part II: Agriculture. Cambridge: Cambridge University Press, 1984.

Chang, Kwang-chih. *The Archaeology of Ancient China*. New Haven: Yale University Press, 1986.

Fagan, Brian M. *People of the Earth: An Introduction to World Prehistory*. New York: Harper Collins, 1992.

Keightley, David N., ed. *The Origins of Chinese Civilization*. Berkeley: University of California Press, 1983.

Li, Hui-Lin. 1983. "The Domestication of Plants in China: Ecographical Considerations," in Keightley.

Redman, Charles L. *The Rise of Civilization: From Early Farmers to Urban Society in the Ancient Near East*. San Francisco: W.H. Freeman, 1978.

Riley, Carroll L. *The Origins of Civilization*. Carbondale: Southern Illinois University Press, 1969.

Smith, Bruce D. *The Emergence of Agriculture*. New York: Scientific American Library, 1995.