

## EVIDENCE FOR EARLY AGRICULTURE IN KOREA

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Archaeological opinions about the presence or absence of plant cultivation at the beginning of the Early Village period in Korea, around 8000 BP, can be divided into optimistic and pessimistic versions. At the recent Circum-Pacific Prehistory Conference in Seattle, Washington, U.S.A., these positions were articulated by Im Hyo-Jai (Im 1989) (the pessimist) and myself (Nelson 1989) (the optimist). The pessimists, pointing to the fact that the first actual plant material found in Korea is cross-dated to 5000 BP or so, suggest that plant cultivation must have diffused to Korea from China at about that time. The optimists, noting a number of indirect indications that plants were utilized with increasing intensity in the preceding time periods, suggest the likelihood of some forms of plant manipulation from the time of the earliest settled villages. The question of the relative contribution of plants to the subsistence base of the early settled villages could be more easily solved if there were plant preservation, or pollen cores, or other definitive evidence of the use of wild or cultivated plants. The absence of these classes of data requires that inferences be made from the evidence that is extant - stone tools, pottery, dwellings, sites, and site distributions, along with the few shell-midden sites where faunal remains have been preserved.

The earliest cultivated plant remains found so far are from a site in North Korea - Chitamni - in the basin of the Taedong river near the center of the peninsula. Reports from this site are less specific than one might like, referring to carbonized grains found in a ceramic container of Chulmun style in a layer which is guess-dated to 3000 BC. The grains found in the Chulmun pot are sometimes specifically said to be remains of millets, of which two varieties are identified (Chard 1960), although there was no microscopic report (To and Hwang 1957, Kim 1986).

At Chitamni, Chulmun pottery with "wave pattern" (rows of dots undulating below the band) is considered to be "Late Neolithic" (Im 1984). One problem with using this pottery style as a horizon marker is its limited distribution, for the wave pattern is rarely found outside the basins of the Taedong and Han rivers. A more serious problem is that the vessel in which the grains were found was a simple Chulmun pot, just like ones that were found at Amsadong and dated 2000 years earlier, and not a "wave pattern" vessel.

Furthermore, this localized design has not been demonstrated stratigraphically to have any chronological significance. At Amsadong, the wave pattern was originally reported as an early style (Kim 1962). Some scholars have taken this find as a *terminus post quem*, assuming that this site represents the earliest occurrence of agriculture, forming the basis for interpretations which assert that agriculture began at this time, in the "Late Chulmun" period.

Several problems with this formulation can be pointed out. In addition to the problem with the relative dating, there is no compelling reason to assume that the chance discovery at Chitamni represents the first plant domestication. Organic materials rarely survive in the Korean archaeological context. We might more profitably examine the circumstances (e.g. disposition of jars in houses, associated tools) and compare them with other sites. Furthermore, recent discoveries in northeastern China show that a fully agricultural economy was in place in the Manchurian plain and the Liaodong peninsula at a much earlier date - by 6000 BC at the latest. If diffusion is to be invoked, why would it have taken so long for plant domestication to arrive in western Korea, a boat ride of only a few days from the Liaodong Peninsula? Finally, it is equally reasonable to posit that plant domestication at the Chitamni site is the result of a long process of human-plant dependency developing in place on the Korean peninsula, rather than a recent Chinese import.

Proponents of earlier agriculture adduce more indirect evidence for this point of view. It is important to review this evidence, and to point out the arguments that those who adhere to the pessimistic view of early agriculture in Korea need to refute if their view is to prevail. It must be emphasized that the lack of preserved plant remains in sites is not, in itself, evidence for a lack of plant use, for of course we all agree that plants must have been used for both food and non-food purposes. It seems to be less clear to the pessimists that it is also not an argument for a lack of plant domestication, it simply means that there is no evidence present one way or the other. In the absence of irrefutable tangible remains, both sides are constrained to argue using only the data that are available. I would like to place the Korean sites in ecological perspective in order to reassess the likelihood of agricultural stages at different times.

#### MESOLITHIC SITES

Some relevant new data come from Mesolithic sites. Until the last five years or so, the existence of a Mesolithic period in Korea was usually denied, and it was widely thought that the Korean peninsula had become depopulated during the late Pleistocene, with a new population beginning to trickle in about 8000 B.P. (e.g. Kim 1981, 1986). "Microlithic" tools were noted from sites in North Korea (Chard 1960, Choe 1986), and the site of Sokchang-ni in the south contained microcores in its uppermost level, but none of these finds were accepted as Mesolithic when they were reported. An upper layer at Yonggul cave showed a warming trend, which was tentatively interpreted as indicating a post-Pleistocene layer (Lee 1982; and see Sohn *et al.* this volume). The well-known site of Tongsamdong also produced a non-pottery layer in an early excavation, with obsidian

flakes and tools (Arimitsu 1962:58). Recently, several additional sites have produced layers with microcores, microblades, and other lithics not associated with pottery but beneath ceramic layers. These are increasingly being reported as Mesolithic, and are beginning to close the time gap between the Late Pleistocene and the Early Holocene. Some of these are inland sites, such as those found in the Juam Dam area or the site of Imbulli in the southeast. Others are found on islands off the southern coast.

For example, two of the coastal sites, Sangnoda Do and Yokchi Do, are shell mounds on islands some distance from the coast. Yokchi Do contains four layers, of which the lowest has no pottery, but does have microliths in addition to small scrapers, knives, blades, and bifacial points (Choe 1986, Chinju 1989). The pottery in the upper three layers runs heavily to Chulmun, associated with stone tools including hoes, axes, and scrapers. Sangnoda Do produced both large and small lithic tools in its pre-ceramic level. The large tools - choppers, scrapers, and general purpose tools - outnumber the small ones significantly. Large crudely chipped tools in fact continue throughout the ceramic layers as well (Dong-A 1984).

The significance of the Mesolithic presence for understanding the origins of agriculture is that it changes the way we must think about the early ceramic sites. When it was assumed that the peninsula was empty before it was colonized by peoples who made pottery, questions posed were: where were the antecedents of these newcomers and what skills did the new inhabitants bring with them? Now we also need to ask whether pottery-making was developed by the Mesolithic inhabitants, and if so in response to what needs. If not, what did the immigrants bring with them besides pottery?

The earliest radiocarbon dates do not pertain to the Mesolithic layers. Until recently, at Osanni the earliest date was 6150-5573 BC (KSU 515), associated with the stamped pottery. Now there is a date of 12,000 BP from a house floor with pottery in Locality A (Im and Kwon 1984). Yunkimun pottery in Level V at Sangnoda Do is dated at 5540-5195 BC (Sohn 1982). If the Mesolithic sites are earlier (as one would expect), they may well reflect a much earlier coastal occupation of Korea, comparable to Incipient Jomon. Boats which would allow settlement from the sea have not been found in Korean sites, but would surely have been included in the material inventory of the sites as they were in Japan (Ikawa-Smith 1986). At Osanni, fish-hook shanks are 3-5 cm long, indicating large fish, and bones of deep sea fish were present in the lowest layers of all sites with faunal remains. A strong inferential argument for the use of sturdy boats capable of covering easily the short distance from the Korean peninsula to the Japanese islands is thus made.

#### EARLY VILLAGES

After the Mesolithic, the Early Villages period in Korea is recognized by the presence of Chulmun or Pre-Chulmun pottery and semi-subterranean houses with central square hearths. Although the dwellings are similar wherever they are found, the early pottery takes a great variety of forms and decorative patterns. Most of the early incised pottery (Chulmun) is found on the central west coast, often decorated in small strokes made repetitively with a single pointed tool. On the east and south coast pinched, appliqué and

stamped decorations (Pre-Chulmun) take precedence over incising of any kind, whether it is made with a multiple-toothed implement or not.

The stone tool assemblages are also quite varied from region to region and even from site to site. Some chipped stone tools appear to be made without a plan, but simply flaked to create an appropriate working edge for the task at hand. Other tools are made from selected pebbles of the desired shape, minimally chipped to form hoes or weights. On the west coast the major tool stone is slate, which is not amenable to careful shaping, contrasting with elegant obsidian implements in the east and south. Ground stone tools are everywhere carefully worked into specific shapes, such as the shanks of composite fishhooks, pointed top-shaped weights, axes, adzes and chisels. Tools made from bone and antler are similarly polished: needles, awls, harpoons, and small fishhooks were made of bone and digging sticks of antler. But these artifacts are not all found together, and their distribution perhaps tells a tale. Let us look at the tool assemblages of some representative sites, beginning with the Mesolithic.

Continuity in stone tools from the preceramic to the lowest ceramic layer of Sangnoda Do is evident. Continuity in subsistence is implied by this circumstance. This inference is supported by the fact that analysis of the shell mound and its contents (Sohn 1982) demonstrates that shellfish collecting and deep-sea fishing were practised throughout the time of deposition of the site materials. The addition of pottery appears to be a phenomenon that occurs along the southern and eastern Korean coasts at about the same time. Tongsamdong's preceramic layer gives a hint of this, as do the Mesolithic layers of Yokchi Do. Continuity from preceramic to ceramic levels is also found in the far northeast at the site of Sopohang.

A new understanding of the early coastal pottery-users thus emerges, with more similarities to the Jomon of Japan than was previously believed. In Early Villages sites with preceramic levels, the pottery itself has pinched (Yunkimun) designs, like some of the Incipient Jomon found in Fukui Cave and elsewhere. Early Villages sites without preceramic layers tend to have complex and well-made pottery in their lowest levels. Yunkimun is found at both Osanni and Tongsamdong, for example, but in the case of Tongsamdong plain polished surfaces are found as well (Sample 1974), while stamped decorations appear at Osanni (Im and Kwon 1984). This pottery is well made with complex shapes, unlike the simple wide-mouthed basket shapes of Incipient Jomon. This sophisticated ceramic industry suggests that some sites were settled by an expanding population which already made pottery, while other, presumably earlier sites, developed or acquired pottery on an essentially Mesolithic base.

Classic Chulmun pottery is found earliest in central western Korea. Extant radiocarbon dates are not quite as early as the earliest east coast dates, but they follow shortly in the sixth millennium. For example, the earliest date from Amsadong is 5300-5020 BC (N 2337). Thus these sites existed for some 2000 years before the pessimists believe people were growing plants. Stone tools in these sites include hoes, grinding stones, and axes which may be agricultural implements. In addition there are stone "ploughs" at Chitamni and Amsadong. Fishing is possibly indicated by weights which are usually referred to as

net sinkers, and projectile points also occur, although they are rare. The rich bone and antler tool inventory at Kungsan on the west coast, with antler digging sticks and boar-jaw sickles, warns us how impoverished are the majority of sites where bone has entirely disappeared.

It is generally agreed that by the second half of the Early Villages period plant cultivation had begun, because as noted above, at Chitamni there is irrefutable evidence in the form of cereal grains inside a Chulmun vessel. However, whether or not plant domestication already had a long history in Korea, classic Chulmun spread from the west to the east and south at about 3500 BC. Formerly exclusively found in the western river basins, this pottery appears in upper layers at Osanni, Tongsamdong, Sangnodae Do, and many other sites. Changes in stone tools are also noted, especially the addition of pebble weights and thin hoes crudely chipped from slate, both associated with Chulmun in the west. It seems that this may represent the spread of domesticated millets to areas that were previously only fishing villages (Im 1984, Sample 1974).

#### OPTIMISTS AND PESSIMISTS

The optimistic interpretation which argues for some form of plant/human co-evolution back to 6000 BC is based on a view of plant domestication as a very long process. A useful statement of this view has been made by Rindos (1984). He calls the earliest stage *Incidental Domestication*, when people manipulate plants but do not depend on them for subsistence. People have an effect on certain plant species, perhaps moving them or manipulating their environment, but are not yet dependent on those plants for a large percentage of their food. This stage is all but invisible in the archaeological record. *Specialized Domestication* is a stage in the process when an ecological niche has been specifically created for domesticated plants. *Agricultural Domestication* is the stage at which people become dependent on the plants, and the amount of plant food produced becomes clearly visible in the archaeological record.

Using this formulation, it is reasonable to suppose that *Incidental Domestication* was practised in even the earliest Early Villages sites. These appear to be permanent villages, based on the inference of year-round resource utilization and the investment of time in building the dwellings (Nelson 1975). Although the major food sources may have been marine products - fish, shellfish, sea mammals and seaweed - the use of land resources such as deer and boar is attested in all the shell middens. It is unlikely that plants were overlooked. At a minimum, sources of raw material for cordage would have been needed, for netting, fishlines, boatlines, and so forth. Fruits, nuts, and berries must have been collected as well. Occasionally nutshells have survived. Moving useful plants to land near the permanent village where they could be tended and encouraged, as well as harvested more easily, seems likely rather than unlikely behavior.

As an alternative to the pessimistic view, perhaps the spread of the Chulmun complex relates not to the discovery of agriculture in itself, but to domesticating a storable crop (millet) on which a village could depend for a large proportion of its food. The size of

wide-mouthed pots increases dramatically along with the Chulmun pottery. Storage has clearly become more important - or something new is being stored in pottery containers.

Rindos (1984) predicts the slow growth of domestication from Incidental to Specialized to Agricultural, becoming fully visible only in the last stage. He also predicts instability once a population becomes dependent on agriculture, because floods, droughts, and other unpredictable events which markedly diminish the yield could cause whole villages to move, taking their seeds and agricultural knowledge with them. This may be an appropriate model for the apparently sudden spread of the Chulmun style. The pessimists and the optimists thus are operating with different models of what agriculture means, and what can be expected in archaeological sites as a result. Positing a long time of plant experimentation before dependence on agricultural produce, according to this optimist, allows for a more complete picture of these early settled societies.

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