

A SUMMARY REPORT ON PLEISTOCENE RESEARCH IN KOREA

Sohn Pokee*

Since Korea is divided into northern and southern political units correlations of Pleistocene studies are not as well established as they should be. Information is not exchanged directly and it is difficult to report much for northern Korea as we do not have access to the artefacts, fossils, and site information for this region. References to northern Korea in this report are based on publications obtained belatedly through third parties.

It is interesting, however, that Pleistocene studies on both sides started almost simultaneously in the 1960s. In the south, Palaeolithic discoveries were not initially accepted as it was believed that no such early industries existed in Korea, owing to the Japanese preconception that the "Aneolithic" stage was the beginning of Korean prehistory. Studies in the south were largely limited to typology, dominant here as in other countries at an incipient stage of archaeological theory. In the north, palynological and palaeontological studies were in progress as caves with faunal and floral materials were excavated.

GEOLOGICAL BACKGROUND

Korea encountered Phanerozoic geological events as a part of the Sino-Korean paraplatform. Precambrian granite formations cover close to 70% of the total area of the peninsula, and erosion of these formations has produced river valleys which trend mostly east to west. The study of riverine terraces is still poorly developed, as is that of the western coastal terraces. However, those on the eastern coast have been studied in more detail by quaternary geologists (Lee *et al.* 1990).

Cambrian and Ordovician marine sedimentation in northern P'yongan and Ch'ungchong has produced well-developed karst formations. These run from northeast to southwest in two bands at 39-40 and 36-37 degrees of north latitude (Figure 1). In the caves found in them early hominid sites are found with animal and human remains. The cave sites that have yielded faunal remains related to hominid activities date to the early Middle Pleistocene. In the riverine areas open sites, also of early Middle to Upper Pleistocene date, are found.

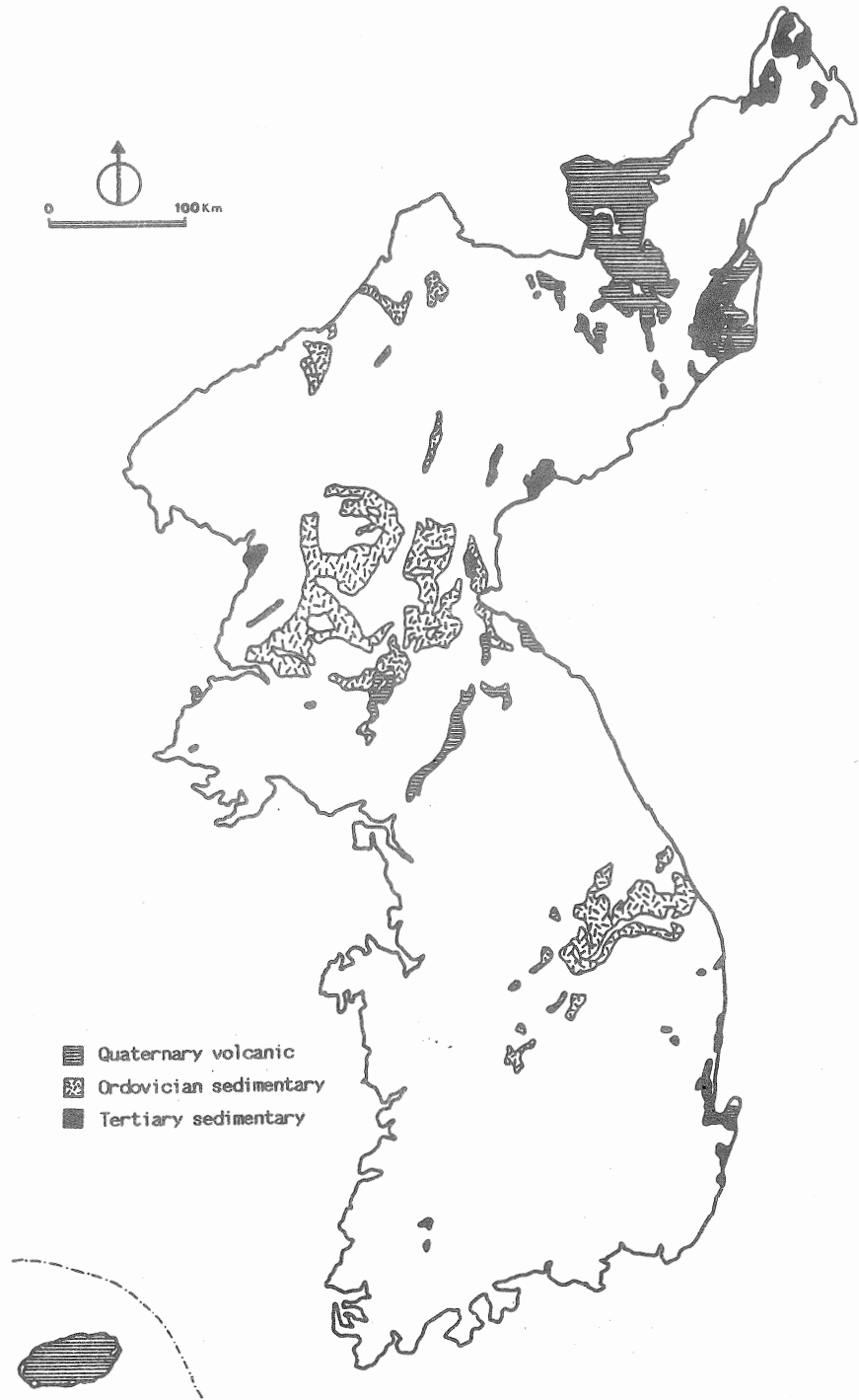


FIGURE 1: PARTIAL GEOLOGICAL MAP OF KOREA

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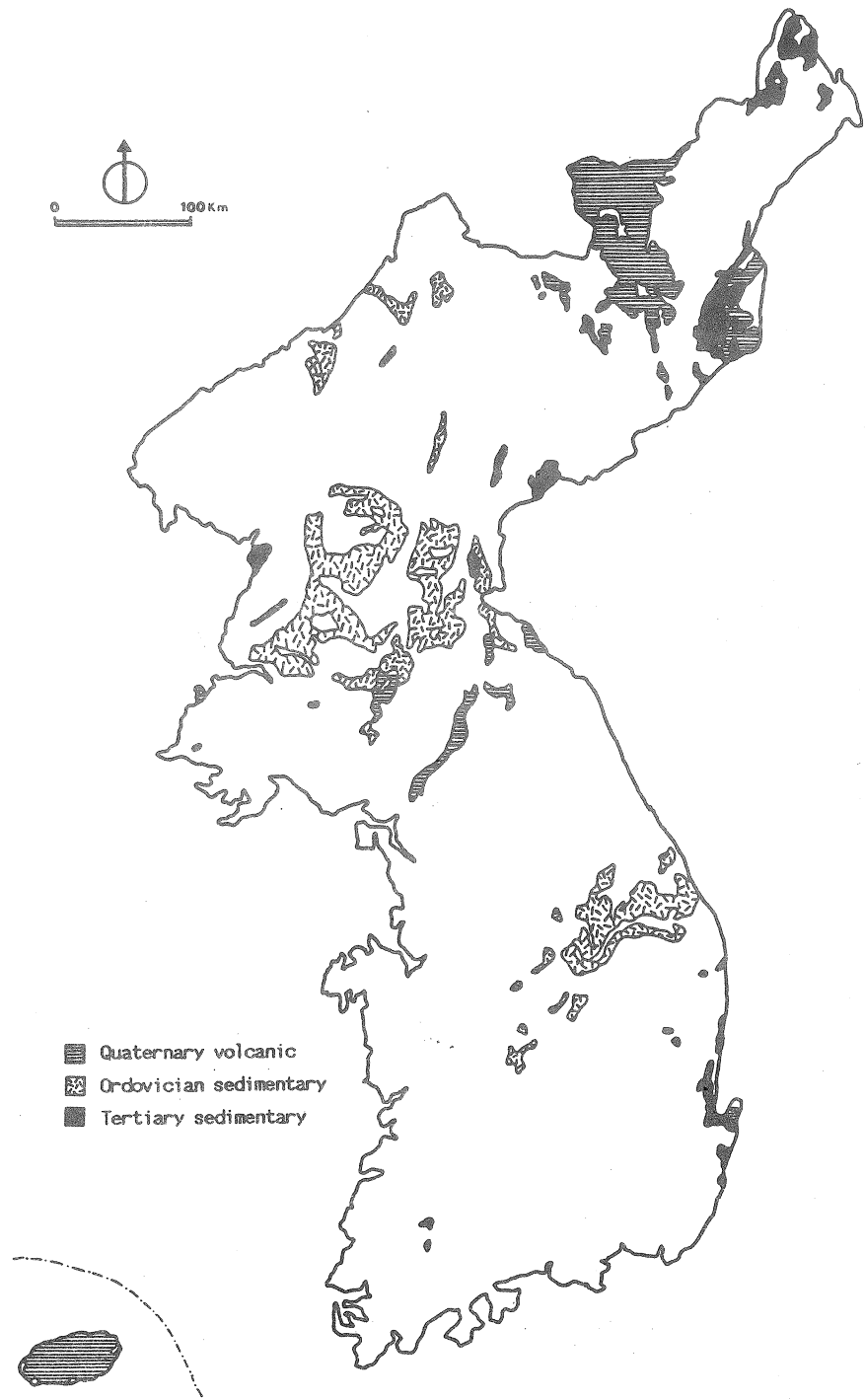


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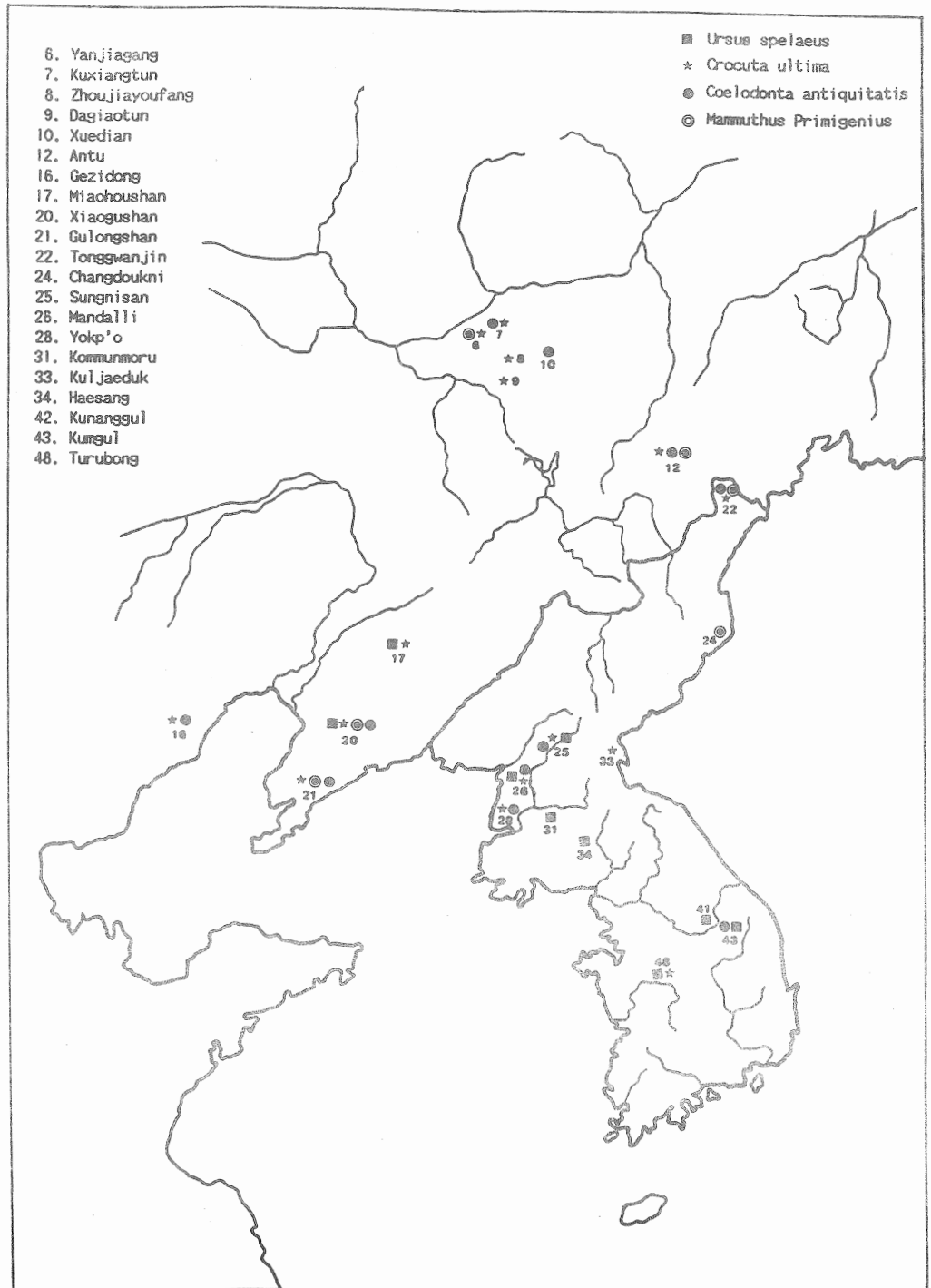


FIGURE 2: DISTRIBUTION OF COLD CLIMATE PLEISTOCENE FAUNAL ASSEMBLAGES IN KOREA

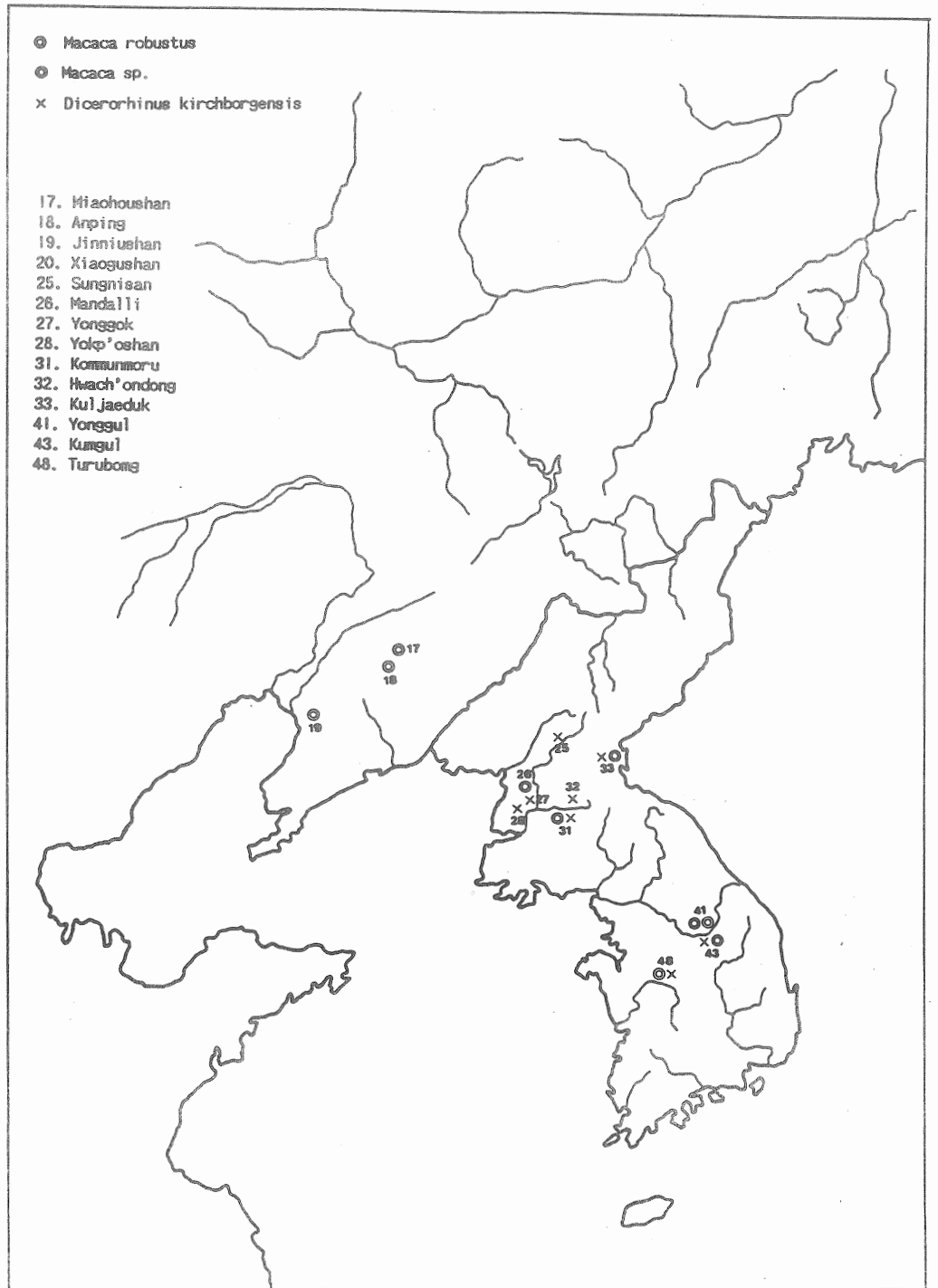


FIGURE 3: DISTRIBUTION OF WARM CLIMATE PLEISTOCENE FAUNAL ASSEMBLAGES IN KOREA

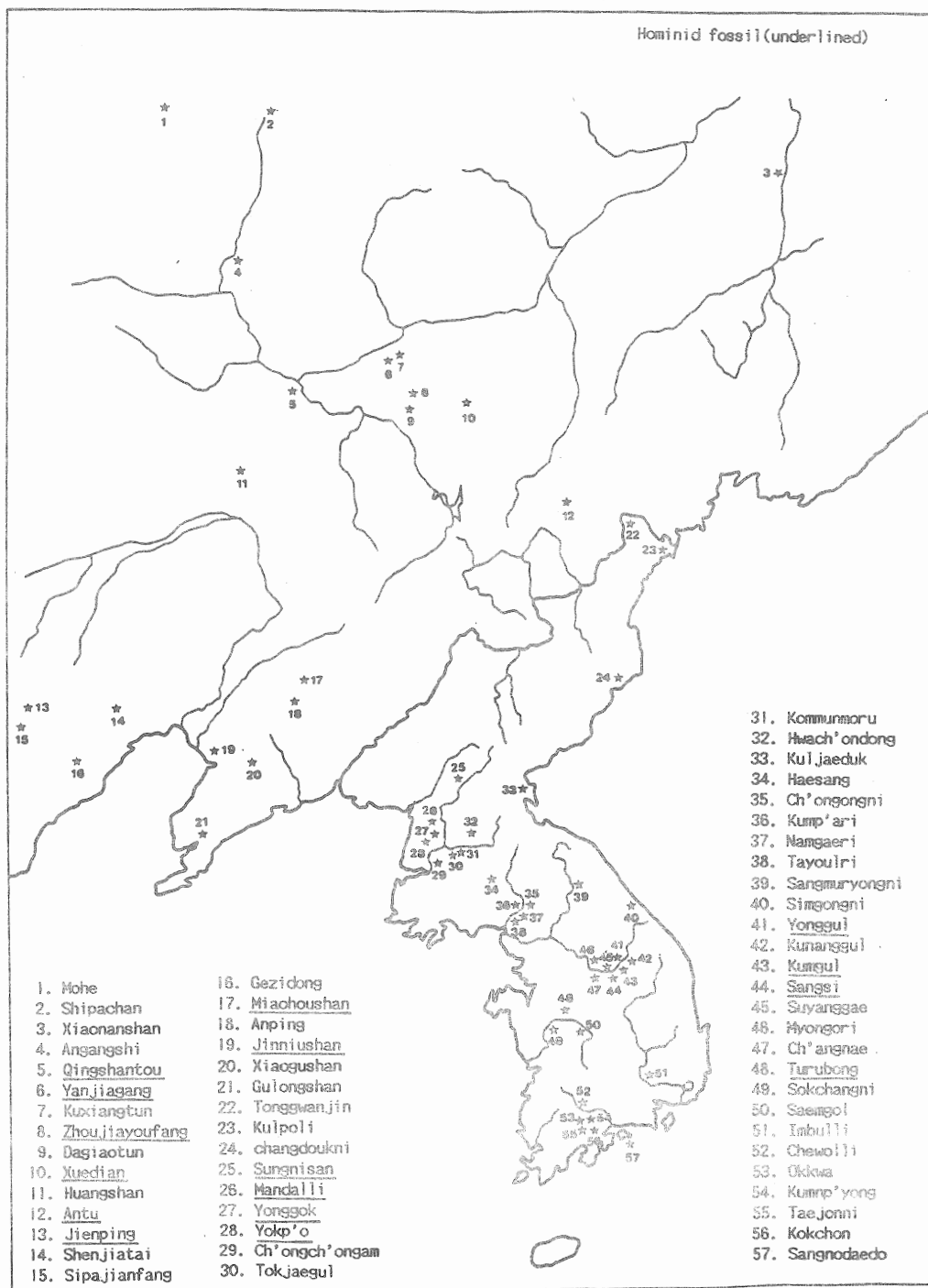


FIGURE 4: DISTRIBUTION OF PALAEOLITHIC AND MESOLITHIC SITES IN KOREA

Tertiary sediments are restricted to small areas on the northeastern and southeastern coasts of Korea. The chances of finding remains of Tertiary hominid habitation seem therefore scanty and nothing related to hominid activity in this period has so far been found. The lithological sequence of Korea consists mainly of Mesozoic and Palaeozoic substrata overlain by Holocene alluvium. Tertiary and Pleistocene strata are rare. However, careful study proves that there exists a series of marine terraces at five different altitudes. The first terrace at 80-100 meters in Chongdong is attributed to the Gauss episode. The second at Pukp'yong, at 50-60 meters in elevation, is considered to be of Matsuyama (Matuyama) age.

The oldest Quaternary terrace is observed in the Ulchin formation of the early Middle Pleistocene, at an elevation of 35-42 meters. The second terrace at Na-a at 10-15 meters is considered to be Upper Pleistocene; the third terrace at an elevation of 3-5 meters is attributed to the Late Pleistocene, approximately 11,000 to 50,000 years BP.

FAUNA AND FLORA

The distribution of faunal remains in Korea (Figs 2 and 3) is similar to that in Manchuria or the Tungpei area of China. The common presences of *Ursus spelaeus*, *Coelodonta antiquitatis* and *Crocota crocuta* in the cold phases, and *Macaca* and *Rhinoceros* in the warm phases, are comparable. This is significant as such fauna are not found in insular Japan. However, *Macaca* seems to have migrated to Japan via a landbridge from Korea. The most northern latitudinal findings of *Macaca* are above 40°N latitude, and the southernmost limit in Korea of *Ursus spelaeus* is 37°N. The southernmost limit for *Mammuthus primigenius* is likely to be 40°N. (Sohn 1988a).

Pollen and charcoal have been recovered mostly from cave sites, and some open sites as well. In northern Korea a complete skeleton of a woolly mammoth was uncovered in a peat bog at Hwadae and careful analysis of the site stratigraphy was conducted using palynological data (Ro 1962). Based on research on pollens and algae a Quaternary stratigraphy has now been established, and more palynological studies have been conducted to trace vegetational history at Ryonggok (Ryu 1986). This has helped to correlate the coniferous tree pollen in Yonggul cave with cold faunas, and broad-leaved tree pollen with warm faunas (Sohn 1974, 1984).

An interesting find made in Turubong cave 2 was a concentration of *Azalea* (Ericaceae) pollens in a location on the cave living floor (Lee 1984). This is interpreted as evidence for the bringing in of *Azalea* by humans, probably for aesthetic or dietary purposes. Recent studies of pollens have also been conducted in marsh and peat areas in the eastern and western coastal areas in order to elucidate prehistoric environments and to track sea level changes (Park 1969).

STONE TOOLS

Although sporadic handaxes, Levalloisoid, and Aurignacoid tool types have been discovered at the Sokchang-ni site, many of the tools found in Korean sites are of atypical form when compared to European archetypes. Zhoukoudian tool types have been given

more attention for comparative purposes. The basic differences in the typology of tools from those of European and other industries are mainly due not to mentality, technology or culture, but to environmental factors such as differing rock materials and different life-style adaptations to variable natural conditions (Sohn 1988b). Through experimental flaking it has been demonstrated that the petrological variations in grain and structure of rock materials certainly contribute much to the results of flaking. In my view it is most convenient to categorize quartz tools according to Mary Leakey's typology, and flint tools by Bordes' typology.

Furthermore, it is necessary to classify tools by functional as well as by typological criteria. We wish to reconstitute early human behaviour through the study of tools, to know how early humans flaked, and how they used tools in the contexts of their lifestyles.

One of the features we found in the study of the tools of quartz and quartz-like materials from Sokchang-ni was a preference for quartz plaquettes with at least one natural flat surface that could be flaked easily. Our assumption from this observation is that the inhabitants of Sokchang-ni seem to have organised their tool making with a view towards efficiency rather than aesthetics. However, some quartzite tools at the sites of Chonggong-ni, Changp'a-ri, Kump'a-ri, and Kawol-li include more aesthetically-oriented forms of Acheuloid, Levalloisoid and Aurignacoid types.

Recently we have discovered a new technology in the production of concave crescent flakes made from medium-sized flat discoidal cobbles. These tools can be made easily using a bipolar flaking technique and the flakes themselves can be used as double side-scrapers. Experimental flaking of such tools has been carried out successfully with granite and gneiss cobbles 7-9 cm in diameter and 2-3 cm thick. This tradition existed from Middle Palaeolithic through to Neolithic layers at the Kumgul site, and the technique has been named the Kumgul Crescent Flake technique.

Fine-grained volcanic rocks are rare in Korea, although some limited occurrences are marked on Figure 1. Obsidian tools do occur in some Upper Palaeolithic and Neolithic sites and these have been checked for trace elements by Gamma ray examination. Some of the Palaeolithic obsidian tools originated from the Manchurian border and others originated from Kumsong Mountain or other unknown sources. None are attributable to Kyushu sources such as Nagasaki or Itatsuke, as once thought by some scholars.

Bone tools

Intentional bone working and modification were observed among the bone materials from Yonggul, Sangsi, Turubong and Kumgul caves, together with animal-cracked and tooth-marked bones. Questions about the intentional use of bone for tools raised during the 1970s can be answered by analysis with a Scanning Electron Microscope (SEM), and through experimental bone flaking and retouching. Some 2000 flaked and/or retouched bone tools have now been subjected to usewear analysis (Sohn 1988a), and modification of bones by incision, piercing, punching and cutting has been recognized by SEM analysis. In addition, the layout of the eyes and mouth of a human on a radius of a woolly rhinoceros can be regarded as the intentional workmanship of early humans, dating to

perhaps 66,000 years BP (see Pokee *et al.* following). Similar motifs have also been found in Turubong caves 2 and 9. There seems to have been a tradition in Korea of delineating human faces on bone, shell or clay in both prehistoric and historic times (Sohn 1990).

HOMINID FOSSILS

Hominid fossils of early and late Upper Pleistocene date are known from eight sites in Korea (Figure 4). Early Upper Palaeolithic sites are numbers 25 (Tokch'on or Sungnisan), 28 (Yokp'o), 27 (Ryonggok), and 44 (Sangsi). Late Upper Palaeolithic sites are 26 (Mandal), 41 (Yonggul), 43 (Kungul), and 48 (Turubong-Hungsu). The earliest remains so far seem to be those from Yokp'o, which include parietal, frontal, and temporal parts. The Sangsi parietal fragments, scapula, radius and ulna seem to carry morphological traits of archaic *Homo sapiens*. Two molar teeth from Tokch'on seem to belong to the same age. However, the six Ryonggok skulls, although dated to 400,000 BP by thermoluminescence dating, look younger in view of their morphological features. Follow-up studies on this site are awaited (Ryonggok cave site 1986).

Hominid fossils belonging to the late Upper Pleistocene period include a rather complete skull from Mandal; a parietal and frontal in one piece, well preserved but fragmentary, from the Kungul site; a whole skeleton from Turubong-Hungsu cave; and some digital and carpal bones unearthed from Yonggul cave.

It was also of great interest to find human hair spread on the habitation floor at the Sokchang-ni site, dated by radiocarbon to to 20,830 BP. The hair strands are similar to those of modern Koreans and different from Caucasoid or Negroid populations.

EFFORTS FOR CONSERVATION AND PRESENTATION

The Korea Institute of Prehistory (a private organisation) is making efforts to perform research on the lifestyle of early humans and the National Cultural Property Institute is currently conducting research on conservation and replica production. The Korea Museum of History and Prehistory is now planning to display aspects of prehistoric life. Where necessary, moulds are now taken at sites with latex, Korea paper and silicon rubber. Replicas are made with plaster, paper-clay and fibre-glass for display, preservation and exchange purposes.

The reconstruction of a Palaeolithic hut has been attempted based on a pattern of post-holes recorded by me in the 1970s, and the following paper by Park Hi-hyun is concerned with this (see also Park 1989). Attempts have also been made to classify stone tools in terms of function, within such categories as hunting, butchering, kitchen and general use. Tools for heavy, medium, and light duty tasks have been identified, and attempts have been made to divide these tools into right-handed and left-handed categories according to grasping features, shapes and usewear analysis. We are able to distinguish these categories to a certain extent by SEM, or even with a simple magnifying glass to identify striae and usewear glosses. Approximately 7% of the tools in the upper layer at Sokchang-ni proved to be left-handed, a percentage similar to that in the modern population of Korea.

CONCLUDING REMARKS

Pleistocene research in Korea started only two decades ago and faces difficulties due to a scarcity of specialists in related scientific fields, to a lack of scientific establishments such as a dating laboratory, and due to the small number of interested students in higher educational institutions. Furthermore, the political division between the northern and southern parts of Korea makes it difficult to undertake comparative studies and to exchange information.

However, future unification of the country, once accomplished, should accelerate the progress of Pleistocene studies, with benefits not just for Korea but also for surrounding regions such as Mongolia, Manchuria, Siberia and Japan.

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