

## Chapter V

### THE NATURAL SETTING OF THE MIDDLE HAN

The Han River basin forms a particular variant of Korea's physical geography. Ruggedness characterizes the terrain, although there are no high mountains. The river itself (485 km. long) is the second longest river in Korea and has the largest basin, of 25,850 square kilometers. The annual flow is 16.7 million cubic meters. The river flows from the mountains of eastern and central Korea generally westward and empties into the Yellow Sea near Kanghwa Island. The river rises in the eastern mountains in two branches of nearly equal length and flow, the North Han and the South Han. These branches join 35 km. east of Seoul and meander their combined way nearly 200 km. to Incheon, while the direct distance is only 40 km.

The headwaters of both branches rise in extensive outcroppings of granite-gneiss. The South Han intersects a block of mica schist, flows between limestone cliffs, and in a few places cuts across remnants of siltstone beds. The North Han cuts through a deposit of red sandstone as well as the usual granite-gneiss hills.

From the confluence of the branches there is only a drop of about 15 m. to the sea, giving the river from that point a very low gradient. Tides are measurable as far upriver as Seoul. The Middle Han is thus the section of river from the beginning of the low gradient at the confluence to the beginning of the tidal estuary at Seoul.

It is largely only from the confluence of the two major branches to the sea that much alluvium has been laid down, and even here it is not deep. The thickness has been estimated at 8 meters. Sand

and gravel islands are found at fairly regular intervals, particularly at bends in the river.

#### Fauna

There is unfortunately very little information on the pre-historic subsistence resources which were available to the people of the Middle Han phase. The following discussion rests on the assumption that there has been no significant change in the climatic pattern in the last 5000 years. If this is so, then uncultivated plants, undomesticated animals and marine resources available today can be presumed to have also been present during the Chulmun period. A few species that may have disappeared or become less frequent due to the activities of man and his expanding population are mentioned in early historic sources and are included for completeness.

#### Marine Resources

Fish of many sizes and kinds, shellfish, seaweed, and other sea plants are intensively utilized by Koreans at present. Lee (1955: 178) reports that there are 75 kinds of edible fish, 20 kinds of shellfish, 15 algae and 10 kinds of other sea animals and plants used by Koreans for food. This abundance is partly due to the existence in the seas off Korea of both cold and warm currents which sustain diverse sea life. In addition, a very long coastline with many indentations, peninsulas, and islands on the west and south, adding up to about 18,000 km., provides a great variety of niches for creatures of the sea.

The intensive utilization of resources of the sea can be confirmed by a visit to the open-air markets during any season of the year. Both the abundance and variety of fish and other sea products are often quite remarkable. Dried fish are for sale in any season. According to Lee (1955:178), "it has been indicated that as much as 85 per cent of the animal protein consumption of the Korean people

was provided by sea food."

The marine fish yellow corvina is the most important commercial fish, with spawning grounds in the Yellow Sea off Kyonggi Do to which the fish return in May and June. The fish are carried by tidal currents into large weighted nets supported by long poles up to 60 feet long. Squid, savory pike, Alaska pollack, and shrimp are caught off the east coast of Korea, while hairtail mackerel and anchovies in addition to yellow corvina are obtained from the west coast. Seaweed (laver) is collected and dried along the east and southwest coasts. It is harvested in the spring and summer, then dried and used all year for flavoring. There is also a reddish sea creature called yonggi, considered a great delicacy and collected all year. So are oysters and clams; the former are a frequent ingredient of winter kimchi. Sardines used to be an important food resource, but due to overexploitation they have disappeared from Korean waters in this century.

#### Riverine Resources

River fish and shellfish are far less abundant than sea products. This is probably due to the large seasonal differences in river flow, especially the yearly floods in summer which disturb any quiet pools where shellfish might have developed. It can be seen, however, from the river deposits in several places that marshes did develop and persist for long periods. The probable backswamp at Misari will be described below. A later backswamp, evidenced by sticky grey clay, is found farther down the river past Amsari. In it was found a wooden platform and Paekche objects. Perhaps the use of marshy land for rice paddies and the creation of other wet lands by spreading out the waters of tributary creeks has inhibited the development of natural marshes. In any case, there are no true shell middens along the rivers nor other indications of previous large populations of river molluscs.



As far as we know, shellfish were not taken from the Han River, although a few small (3 cm. long) bivalve shells were collected from the edge of the river, and a collection of perhaps 100 such shells was found by the river on a hillside at Kusan. Considering their small size, it would take large numbers to be a significant part of the diet.

Han River fish are not commercially exploited except in early spring, when fish, which are caught in the South Han a short distance above the confluence of the two branches, are eaten on the spot by people from miles around. Sporadic net fishing by the river-side inhabitants occurs, but the fish are rarely over 6 or 7 cm. long and thus cannot form a basic part of the diet. Bishop (1905: 91) reports from the Han "that the river fish...were very minute and bony." There are a few larger fish between 20 and 30 cm. in length in the deeper parts of the rivers throughout the year. Species found in the Han River include Ophiocephalus argus, Cyprinus carpio, Plegoglossus altivelis, and Coilia ectenes (Anonymous 1961). Trout is caught in the Nakdong River, which flows to the south, and all the eastern rivers, but not in the Han River.

#### Methods of Fishing

Fishing in Korea, as reported by onlookers within the last century, has retained some methods that may go back to prehistoric times. Zaichikov (1952:79), for instance, says that

Korean fishers use mostly small wooden sail-vessels, with very heavy masts. Sails are sometimes made of matting instead of canvas. Such vessels can risk going to sea in quiet weather only. Fish are caught with nets. In the rivers and along the sea-coast fish, molluscs, and crabs are caught chiefly with primitive equipment (weirs, nets, and others), or simply by hand. Fish are collected on sand banks and are dived for in the water.

Bergman (1938:97) reports women and small girls "continually to be seen catching small crustaceans (Gammaridae)" along the coasts. The women caught them in their skirts. He also saw shrimps harvested in a lake near the sea, with a long pole-net dragged along the bottom.

#### Mammals

As far back as the beginning of recorded history, and even in the origin myths, the wild animals associated with Korea have been animals of the forest. This accords with the assumption of little climatic change and a similar vegetation for prehistoric Korea, allowing only for changes wrought by agriculture.

According to the most widespread origin myth, the ancestor of Korea, Tangun, was born of a bear in 2333 B.C. There are, however, few bears in present-day Korea, nor does the bear figure widely in folk tales and folk art. The bear legend is probably linked with the widespread bear cult of various peoples of Northeast Asia.

The tiger appears in the origin myth also, and although the bear was believed to be the progenitor of the Korean people, the tiger appears much more often in the folklore of Korea. A pre-Buddhist deity, known only as the Mountain Spirit, is frequently found in side shrines of Buddhist temples, recognizable by the presence of a tiger. The tiger is greatly feared, apparently with some reason. An English traveler in the 1890's tells of tiger traps baited with live animals placed at either ends of villages (Bishop 1905:173); they are also mentioned by Hulbert (1906:21). Even in this century the tiger was still a menace (Bergman 1938). Tiger skins were sent to China in tribute in early historic times (Gardiner 1971).

A painting from the tomb, dating from the 5th-6th century A.D., of a tribal chief at T'ung-kou, just across the Yalu River in Manchuria, shows a hunting scene, with deer and tiger being hunted

by mounted horsemen using bows and arrows. Colby (1966:95-98) calls the deer of Korea Cervus nippon nippon, known popularly in Japan as Sika deer. They are two to three-and-a-half feet at the shoulder. Their coat is a bright chestnut dappled with rows of white dots in summer, but in winter they grow a heavy coat of blackish brown. A different species is mentioned by Bergman (1938:119), Pseudaxis dybowskii (cervus nippon hortulorum, according to Colby 1966:99), which are found in the woods of northern Korea. The antlers of these deer, when in the velvet, have been much sought after since antiquity and are still exported to China where they are believed to have medicinal value. Antlers have been found in a number of coastal shellmounds of the Chulmun period, frequently fashioned into artifacts. The deer population in central Korea is now very low, but some idea of the potential can be gained by the rise in numbers of deer within the Demilitarized Zone. It is said that nearly every shooting by sentries at noises in the night, which occurs several times nightly, turns out in the morning to have been a deer.

Very large wild boar are found in the northern mountains and are reported to be even more terrifying than the tigers. They are five to six feet long, with long, black fur. Paintings from the Yi Dynasty (14th-20th Century) show rather smaller wild boars being hunted. The relationship of the domestic pig of Korea to the wild boar is unknown. The domestic pig is small but also black. Zaichikov (1952:63) remarks that "hogs are raised in all the provinces, but they do not have any especial significance in the Korean economy. Only a small number of peasant households breed hogs." However, the pig figures widely in Korean folk tales and humor. Lattimore (1951:110,111) links pigs with shamanism and also with women in Manchuria. Certainly this linkage exists in Korea where the mudang (female shamans) often dance with a pig's head on a trident.



One species of Korean dog, from the island of Chindo, is reputed to be a Pleistocene survival (Sohn et al., 1971:4). Koreans, like the Chinese, have been known to raise dogs for food (Osgood 1950:77-78).

Other wild animals include the goat antelope or goral (Nemorhaedus raddeanus), rabbits, sables, ermines, foxes, martens, beavers, otters, leopards, and panthers. Zaichikov says that marmosets used to be found in southern Korea.

### Flora

Because of intensive agriculture and extensive cutting of forest trees, it is difficult to reconstruct the prehistoric vegetation on the basis of the still remaining forests. In 1940, 52.5 per cent of the land in Korea had standing trees (McCune 1956:58), but during and shortly after the Korean War many more slopes were denuded of trees and brush in a desperate search for firewood. Reforestation has been undertaken, with millions of new trees planted on the hillsides. Present distribution of species, then, is largely recently man-made and not aboriginal.

Korea's natural vegetation is classed as a mixed forest ecotone between boreal forest and deciduous summer forest (Eyre 1968:82) and is part of the East Asian Formation which surrounds the Yellow Sea and extends into the lowlands of Manchuria. This formation is dominated almost entirely by deciduous trees, especially oak, beech, ash, and birch, but it is in contrast to the overwhelmingly pine and scrub oak forests presently found in Kyonggi Province.

Trees of the deciduous forests of Korea produce many edible fruits and nuts. They include acorns, chestnuts, pinenuts, walnuts, and ginko nuts, as well as Oriental pear, persimmon, pomegranate, peach, plum, cherry, and apricot. Several wild shrubs produce edible berries, as does also the yew tree which in Korea bears

sweet berries, usually considered edible" (Zaichikov 1952:31). Wild grapevines have been reported, and mushrooms grow in sufficient quantity to be exported. The ginseng root, Ginseng panax, grows wild in heavily shaded forests. Many kinds of small leafy herbs and roots are still extensively exploited as food by Korean country people, especially in the spring when the leaves are still tender. On a plant collecting expedition one April, some 35 varieties of edible wild plants were collected in the space of an hour. Some of these are familiar as greens in the West also; they are dandelion, wild onion and wild garlic, the latter often dug in the woods. At least one chenopod is exploited wild, one member of the rose family, one member of the apple family, of which the seeds are eaten, and three Brassicaceae to which family both the Chinese cabbage and possibly the aboriginal form of the Korean turnip belong (Appendix C). Many plants are also used as medicines (Crane 1931).

Other useful plants of historic times include various types of reeds and rushes as well as bamboo. The paper mulberry grew aboriginally in Korea, and from it is made several superior kinds of paper. The oiled and polished paper found covering the walls and floors of many Korean houses comes from this plant.

Ramie, or Chinese nettle, is another plant which has been used for its fibers which are very long and strong. It was used to make fish nets and summer clothing. It was apparently deliberately grown, but not in fields: "This staple grows in rows scattered among shrubs and mulberry plants" (Zaichikov 1952:60).

Ramie grows only in the southwest, but hemp (Cannabis sativa) is widely grown and also grows wild. The first Westerner ever to explore the South Han River, Isabella Bird Bishop, noticed and recorded an unusual method of hemp processing:



At the bottom of a stone-paved pit large stones are placed which are heated from a rough oven at the side. The hemp is pressed down in bundles upon these, and stakes are driven in among them. Piles of coarse Korean grass are placed over the hemp, earth over all, well beaten down. The sticks are then pulled up and water is poured into the holes left by them. This, falling on the heated stones, produces a dense steam, and in twenty-four hours the hemp fibre is so completely disintegrated as to be easily separated. (1905:105)

This method in itself argues for the local discovery of the use of hemp, for it is quite different from methods used elsewhere, such as water retting and dew retting.

Even flowers are put to a variety of uses. Azalea, growing wild in the woods, is used for wine-making. Chrysanthemum petals are added to small cakes. There is almost no plant that is not utilized in some way.

The only direct evidence of the plant resources of the Chulmun Period comes from the flotation from the soundings. This unfortunately produced less than was hoped, for most of the materials could not be identified. However, charcoal from the soundings was analyzed by R. C. Koeppen, botanist of the U.S. Forest Service. The larger specimens, which were identifiable, included Ulmus (elm), Prunus (plum or cherry), Quercus (white oak group), Pinus (pine), and Picea (spruce). Thus the presence of the mixed deciduous forest and the use of some of its resources is confirmed.

#### Cultigens

Some of the present cultigens of Korea have a long history, and among them are some which might have been independently domesticated in Korea. The most important of these from the point of view of prehistoric cultivation will be discussed below.

Turnip and Chinese cabbage, both cultivated in Korea in great quantities for preservation, are botanically close relatives (family Brassicaceae) and may both be domesticates of the same wild plant. The vegetable currently widely in use for making kimchi is a form of radish. Three of their wild relatives were gathered on our plant collecting expedition. One of the characteristics of plants which have been cultivated for a long time is that many uses have been found for various parts of the plant (Harris 1967:106). The turnip/cabbage is a case in point, one variety now having gigantism in the root (or rather the underground stem) and the other in the leaves.

The cabbage is not high in calories (320 calories per kg.), but it is rich in vitamins A, B, and C, as well as containing abundant iron and calcium. It also contains enough sugar, salts, and nitrogenous matter to undergo both alcoholic and acid fermentation. Thus it can be preserved without adding other ingredients.

Turnips are high in sucrose but, like the cabbage, a great deal would have to be consumed to fill daily calorie requirements. Turnips are a good source of Vitamin B and an excellent source of Vitamin C. The turnip is a biennial plant requiring two fields in order to have a harvest every year. It is a cool season plant, maturing in November in time for large quantities of winter kimchi to be made. Bishop (1950:Vol. 2:108), calling the turnip a "radish weighing 2 to 4 pounds," remarks that it forms "one great article of a Korean peasant's winter diet."

Although Sauer (1952:25) bases his hypothesis of the primacy of Southeast Asia in food production on the usage of root crops rather than grains in the tropics, Harris (1969:10) points out that "ecologically the common denominator of the root crops is that, through their ability to store starch, they are well adapted to survive long dry or cold seasons and to mature quickly once the rains begin or the ground warms up." Their wild ancestors,

he concludes, must derive from areas of markedly seasonal climate. The Korean turnip, of course, meets this requirement.

Millet is the one grain which is known to have been used in prehistoric times, probably Panicum millaceum (Sohn et al., 1970: 15). Zaichikov (1952:58) notes extensive use of millet in Korea:

Millet and bean staples are very common everywhere in Korea . . . they occupy an important place in the nation's diet. Among the millet staples chimizu is most commonly sown. This differs from ordinary millet by its small grain, and is noted for its resistance to drought as well as by its high yield.

He also mentions grain sorghum (Manchurian millet or kaoliang) as an important cultigen. His observations were mostly made in the north of Korea where rice does not grow well, but the pattern observed may reflect the pre-rice situation in all of Korea. (The first mention of rice in Korea dates back to the first century A.D.) Hulbert (1906:17) writes of "many varieties of millet, all of which flourish luxuriantly in every province."

Millet was stored in "great earthenware jars, big enough to contain a man," according to Bishop (1905:84). She also reports that rice, barley, and water were kept in these jars, although it was my observation that dry items were stored in containers made of straw.

Hemp is often suggested as an early cultigen. It requires a nitrogenous soil and an open habitat, such as can be found in and around camps (Hawkes 1969:19). The plant is useful for its oily seeds as well as its fiber. None of the writers on early Korea mention the leaves being used as a hallucinogen, although they were so used by related steppe peoples. Ancient writings in China indicate that the fiber was used prior to the Shang dynasty. Generally, planting takes place in the spring, and no subsequent cultivation is required. When ready for harvesting the plant is



simply cut off at ground level.

Information on the soybean (Glycine max) is scanty. Its wild progenitor, Glycine ussuriensis, is a native of China and Manchuria as well as Korea (Piper and Morse 1943). Few farm families in the vicinity of Seoul grow their own beans at present. The soybean is much used in cooking, both as bean curd and the liquid from the fermented beans, as it is used in both China and Japan. Bishop (1905:179) mentions the "fermented rotten beans which are the basis of many sauces." Soybeans were probably an early cultigen, but none of the methods of preparation are unique to Korea.

Most of these possible early cultigens in Korea are anthroporous; they like disturbed soil high in nitrogen content and, therefore, tend to thrive near human dwellings. Schwanitz (1969: 121) particularly mentions hemp and cabbage in this connection. Certainly many useful plants must have been available within a short distance of a site, and the step to planting would have been a short one.