THE ECOLOGY OF ANGKOR
Evidence from the Khmer inscriptions

This paper is based on an investigation into the resources of the Angkorian Khmers and their use of those resources, as evidenced on the Khmer inscriptions of the 7th to 14th centuries.¹ The results of this investigation have been elaborated slightly by means of general information taken from works on the modern Cambodian or South-east Asian environment (e.g. Delvert 1961; Fisher 1966) and by means of special information relating to plants, available in the works of Burkhill (1935) and Martin (1971). This paper is divided into three parts: (i) A general introduction to the Angkorian environment as presented on the inscriptions; (ii) Specific introductions to each of the five lists given in the Appendix; (iii) The Appendix, consisting of five lists – 1. Plants; 2. Animals; 3. Minerals; 4. Products; 5. Terms of Measurement.

I

It is well to be forewarned about the kind of knowledge which may be expected from the Khmer inscriptions. Those written in Sanskrit are chiefly poetic praises of gods, kings and learned men. It is the inscriptions in Khmer which are useful to us as sources of information about everyday life. Facts have to be gleaned, nevertheless, from the nomenclature of places and persons as much as from direct references to plants, animals and commodities. The inscriptions record the good works of kings, nobles, Brahmans or lesser dignitaries, who founded new cults and gave gifts, consisting chiefly of land and kīnum,² to existing religious foundations. The lengthier inscriptions give details, such as names and duties of the kīnum, lists of other gifts and the location or size of the ricefields. Sometimes warnings are given of punishment in hell for those who hinder the work of the foundation and hopes of heaven for those who further the work.

The inscriptions tell us incidentally something of the organisation of the land and of the religious foundations. Cambodia was administered through a complex hierarchical system even in pre-Angkor times. That the complexities grew considerably in the Angkor period may be surmised from the increasing length of the 10th and 11th century inscriptions and from the accounts they give of legal disputes, taxes, death duties and so on. They indicate, too, that the work of founding and maintaining cults was taking place on a much larger scale. In the pre-Angkor period, for example, we read of gifts of existing villages, with ricefields and the kīnum to work them. In the Angkor period, however, the founding of new villages is a very common practice. Influential families sent their younger members to acquire land for this purpose and to establish new cults. It was

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an honour to be invited by the king to found a new village; failing such an invitation, one applied to the king oneself. Once a branch of a family was established in a new village, the right to that territory and the right to serve the king by sending him revenues from it was assured for the descendants of the founder. Large areas of land were thus being reclaimed from the forest. It was a regular practice to join together the lands and revenues of two foundations with different gods. Perhaps this was not so much a religious decision as a practical step towards the more economical organisation of an area.

We have little information about the internal organisation of the foundations. The Head of the monastery is occasionally referred to, being, for instance, on one occasion ordered by the king to put up an inscription. Of the monks themselves we hear surprisingly little, though sometimes the provision or cooking of their food is mentioned. It is about the kñûm more than about any other category of person that we have detailed information. The majority of them were workers in the ricefields but there were other agricultural workers—fruit pickers, herdsmen, guards, working outside too. Within the precincts of the foundation were secretaries and cooks and—unless perhaps in these cases they did the actual work at home and brought their goods to the foundation—spinners, weavers and grinders of perfume. Within the temple itself were singers, dancers, musicians and ‘servants of the god’. The kñûm were bought and sold, given to the foundation, counted, drafted to duties, brought up in the service of the foundation. Some were prisoners of war; some were members of tribes who had been brought from a distance. Most, however, seem to have been the people who lived in the area and who, when their services were offered by their master, continued to do the work which they had done before. In the Angkor period the kñûm were usually on duty for the god during one fortnight in each month, that is either for the period of the waxing moon or for the period of the waning moon. During the other half of the month, we do not know whether they worked for their master on ricefields which he kept for his own use or for themselves. One master distinguished clearly between the lands and the kñûm he retained and the ones he gave to the temple but he does not say what the kñûm given to the god do in their fortnight off duty.

Concerning the destination of the rice produced by the kñûm, many inscriptions are quite silent. One is helpful, however, recording as follows the purposes for which the rice was required: “one lîh (capacity measurement) of rice for the morning offering, two cooked lîh for the mid-day offering, a lîh for the evening offering, a basket of rice for the New Year, a lîh for the masters living in the agrama, one lîh for the sacred fire, a lîh for the goddess Sarasvati, a lîh for the almsgiving”. Another provides for specific persons: “The remains from the offering” – which seem to be easy to calculate! – “are to go to the inspector of the royal service (5 lîh); the Venerable (2 lîh); the guard of the store (1 lîh); the keeper of the holy register (1 lîh); and the officiating priest (6 lîh). By putting together these and smaller bits of information, a comprehensive picture may be obtained. Each foundation required rice for offerings to the gods, for morning, mid-
day and evening offerings or for the first and eighth days of each fortnight. For the New Year a large offering was required. Rice was also needed to feed everyone connected with the foundation: the Superior, the guests, the officiating monks, the other monks, the other religious personnel, the persons studying in the ācārya, the kīnum – all are mentioned in one inscription or another. The amount of rice which was going to be required was estimated exactly and the kīnum, listed, often by name, to work on each ricefield or group of ricefields knew how much rice they had to produce per harvest, working during their prescribed fortnight throughout the seasons until some other edict affected them.

The inscriptions informed the local population of the size and exact position of the ricefields given to the foundation. In early pre-Angkor times it is sometimes stated that so many strips of riceland were given at a ricefield known by name, for instance at “Tamarind ricefield” or at “Egg-plant ricefield”. In other cases the location is indicated by reference to local place names, for example: “The extent of the god’s land is from the Spring to Cane Forest to Bees’ Wood to the TrasNhora Pool” and so on. One landmark which occurs repeatedly in this kind of context is the reservoir, usually named as the reservoir of a particular chief. References in inscriptions to the construction of reservoirs are found here and there. Twice we read that “a reservoir was dug and an embankment constructed”. One reservoir was called the “high” one, another the “gravel” one and another the “stone” one. These scraps of information fall into place, however, in the light of Groslier’s studies of Angkor from the air (Groslier and Arthaud 1968) and of Professor’s Luze’s observations (Luze: 1940: pp.290-1) based on the fuller information contained in the Burmese inscriptions. Aerial photography over Angkor shows an extensive system of irrigation, depending on reservoirs at different levels connected to each other, so impressive as to provide the clue, in Groslier’s opinion, to the success of the Angkorian Khmers, the answer to their problem of feeding a huge population. And Delvert (1961) considers the Angkorian irrigation system to be far superior to any modern methods used by the Khmers. Luze (loc. cit.) tells us that in Burma there was a similar system and that it was a work of merit to dig a reservoir. Probably, therefore, when Khmer inscriptions use the term “reservoir of Chief X” to indicate the extent of riceland, they are recording the good work of Chief X and not simply that it was his reservoir.

Land other than riceland and cleared forest is often listed as being offered to religious foundations: forests, hills, lowlands (one named a “lowland with elephants”), gardens, plantations, orchards, pastures. Place names reveal other local features: watersmeet, mound, landslide, exposed roots of trees, etc. Man-made landmarks are found in place names too: bird-trap, boundary mark, causeway, dyke, fishery, path, road, village, wall.

II

The lists given in the Appendix are introduced individually below. It
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should first be mentioned that place names and personal names provide many contributions to these lists, especially to lists 1 and 2. Place names sometimes consist entirely of a plant or animal name, e.g. Fig-trees. More usually, they are composed of a word denoting a geographical or man-made local feature plus a plant or animal home, e.g. Eugenia Ricefield, Citrus Reservoir, Cotton-tree Forest, Shell-fish lake. Personal names for officials tended to be Sanskrit and not connected with plants, animals or everyday matters. Most of the kitum, however, had Khmer names, the majority of which either described a characteristic of the person or were names of plants, animals or objects of daily use.

List I: Plants (Appendix, p. 289).

Martin (1971) comments that right up to the 20th century the majority of Cambodian people turned to the plants around them for almost all the materials of life: for building, clothing, food, medicine, implements of all kinds and for the perquisites of religion and magic. She adds that in such circumstances man respects the plant, taking only what he needs. Many trees have multiple uses in the countryside, which are unknown to townspeople. There is, for example, the variety of cane which is edible; the use of the heartwood of the tamarind to make magic boxes; the procedure of rinsing the hair with the juice of the Randia dasycarpa fruit. Some uses, one feels sure, must go back to Angkorian times; the use of the rough leaves of the Streblus asper to polish shells or of Mariscus for weaving mats. One is struck by the great number of trees of which the flowers are edible: for instance, Dipterocarpus obtusifolius a tree in connection with which one might think only of the reasonable quality of its timber.

Plantations of areca and coconut palms were frequently given to religious foundations in the Angkor period. Areca and betel have in the past been basic necessities of Cambodian daily life, being not only the source of a pleasant creature comfort and an excellent gift but also a necessary preliminary to the arrangement of a marriage and, most important of all, a proper offering to the gods. The coconut palm has many uses apart from its use as a food. Silk scarves are washed in its milk, for example, and its leaves are used for many temporary constructions such as the triumphal arch.

Many Angkorian place names are concerned with the mango and the Bael fruit. The former is thought to be of South East Asian origin, unlike many plants (sorghum millet or, sesame, for instance) which are considered to have come via the Sabbean Lane from Africa to India and South East Asia. The Bael fruit tree or Malabar Orange, which was sacred to Çiva, has a fruit which is eaten in other countries but not, according to Martin, in Cambodia.

Turmeric, which occurs as a place name, is used in Cambodia both as a condiment and to make a yellow cosmetic powder and a dye for mats. The plant Sesbania javanica, which gives its name to a lake mentioned in the inscriptions, produces its yellow flowers just as the floods subside. It has