Chapter 1

Introduction

"The artist's representation is .. a long way removed from truth, and he is able to reproduce everything because he never penetrates beneath the superficial appearance of anything."

Plato: The Republic:598.

It is less than two decades since Higham (1972) described Thailand as an archaeological "*terra incognita*". Preliminary reports of major excavations at Non Nok Tha (Bayard 1971), and Ban Chiang (Gorman and Charoenwongsa 1976), supported by evidence from a series of smaller investigations, however, suggested that, rather than a cultural backwater (Coedes 1966), Southeast Asia, and Northeast Thailand in particular, was a cradle of very early bronze (Solheim 1968, Gorman 1978), and iron working (Bayard 1979). These metals were thought to have been exploited during the 4th millenium and by 1500 B.C. respectively (Bayard 1970, Solheim 1968, Gorman and Charoenwongsa 1976). Clearly, the discovery of bronze working which ran counter to notions of a European invention (Renfrew 1973), or the presence of iron at a time it was generally considered a Hittite monopoly (Allchin and Allchin 1968:207), needed careful explanation. Unfortunately, however, detailed reports clearly setting out the provenance and confirming the stratigraphical integrity of such very early finds were lacking.

Faced with an absence of information necessary for detailed assessments of these startling possibilities, Higham and Kijngam decided to undertake a survey of sites (Kijngam *et al.* 1980), in a settlement pattern which included Ban Chiang, and to excavate one or more of these to gain insight into the prehistory of the region (Higham and Kijngam 1984). Thus the strategy was devised in order to resolve a hiatus in detailed knowledge. This gap extended to settlement size and distribution, social organisation and the cultural role of metallurgy. Information of this nature is a prerequisite if theoretical models designed to illuminate past cultural processes are to be formulated. An extensive corpus of pottery found in association with the metals similarly lacked sufficient study. The writer was kindly invited by Higham and Kijngam to study these wares.

From the outset, pottery has played a central role in most archaeological investigations in Northeast Thailand. Prehistoric wares form the cornerstone of chronological frameworks. Cultures have been characterised by pottery styles, and changes in style have often been directly correlated with culture change. These assumptions have often been questioned by workers elsewhere because exotic styles can be imitated by indigenous potters, thus merely fashions,

not cultural changes, may be involved (Peacock 1967, 1968, 1969, 1970, Shepard 1936, 1942, 1965). Because pottery was often an important item in prehistoric exchange networks, its presence in archaeological contexts, even when it forms large deposits, is insufficient reason to assume it was made locally (Shepard *op. cit.*, Arnold 1985). To redress these problems ceramicists have considered the material pottery is composed of, its fabric, and compared this with the shape and decoration of wares (i.e. style). The origin of pottery can be suggested by identifying minerals within the fabric, and if they are distinctive enough, relating these to appropriate clay sources. Moreover some sources, promoted as likely for other reasons, can be excluded from consideration because they do not contain minerals which match those in the pottery.

The aim of the present work is to illuminate the prehistory of Northeast Thailand through an analysis of ceramics. A detailed examination of material excavated at Ban Na Di (see fig. 1.1 on page 5), provides evidence for comparison with several other excavated and surveyed Thai archaeological sites.. The potential of petrographic analysis based on thin-sections of pottery will be examined with reference to the work of Shepard in the Rio Grande. This latter region features a variety of distinctive geological zones. Most of the present study area is less geologically distinctive. This is because it is located within a relatively homogeneous sedimentary plateau.

Previous ceramic studies have often successfully focussed on the uniqueness or distinctiveness of individual or related groups of pottery industries in order to characterise or categorise them. Several approaches have been employed. Style-oriented studies emphasise form and design differences. A major problem, however, is that styles are susceptible to transient influences and apparently similar wares may actually be quite different. Technological analyses include less ephemeral aspects. They rely on methods common to the natural sciences, and this allows a considerable degree of analytical rigour.

Physical phenomena generally lend themselves to a variety of classification techniques. Early technological studies, in the main, applied established geological methods. The two principal aims of such analyses are the exploration of temporal changes in the potters craft, and the illumination of possible cultural relations through material identifications and the location of their sources. Identification of different sources depends on the distinctiveness of the geological zones under examination, and an ability to discriminate precisely between them. In this respect, igneous and metamorphic zones are often more distinctive than sedimentary regions. Although exceptions to this may occur, many sedimentary regions are for sourcing purposes categorised as "geologically non-specific". Often this is because the analytical detail needed to distinguish between different zones is beyond the scope of normal research demands.

The limitations in such an approach are manifest. Unless the sedimentary region in question contains distinctive minerals or biosome it is likely to be labelled "non-specific". The extent of these indistinct sedimentary regions is unknown, but several factors make it reasonable to assume most will indeed be non-specific. Sedimentary rocks are estimated to cover between 66% to 80% of the earth's crust (Press and Siever 1974, Folk 1980, Tucker 1981). This predominance is exacerbated by a key cultural propensity reflected in prehistoric settlement patterns. Prehistoric societies display a preference for the occupation of sedimentary regions. Easier terrains, often close to waterways, were emphasised. Coastal regions and lake margins, plains and river valleys were preferred. These are principally sedimentary zones. Of course, many exceptions to such settlement patterns, and to the distribution of "geologically non-specific" sedimentary strata, exist. The overall tendency seems clear, however, in both

An examination of broad-scale geological maps will show that many regions contain sediments weathered from sedimentary strata, and it is from these sediments that potting clays are quarried. Sedentary population concentrations in fertile lowland ecotones are readily understood. These areas witnessed the intensification of agriculture and associated population increases (Flannery 1976, Redman 1978). Pottery manufacture is closely connected with agriculture, and although some potters are itinerant, making pots is a sedentary-based occupation (Arnold 1985). These factors have important implications for the technological study of prehistoric pottery.

Although detailed data are unavailable, it seems reasonable to assume that the majority of prehistoric pottery was made in "geologically non-specific" sedimentary zones. Because settlement patterns are associated with subsistence, economic, demographic and related sociopolitical influences (Boserup 1965, Renfrew 1972, Redman 1978, Flannery 1976, Flannery and Marcus 1983), potters probably were often left with little choice in clay resources. Market forces, however, play an important role in the development of pottery production (Peacock 1982). In some regions, large-scale export-orientated production was concentrated in areas of high clay quality (Arnold 1985). A reliable transport system and an established exchange network are key components of this kind of production, and in prehistory they were not always available.

The quality of potting clays varies from excellent to poor (Grim 1962). Many factors affect their quality, such as mineral composition, crystallinity, plasticity and non-plastic content. Clay quality can be affected by naturally present nonplastics or those the potter adds. Most clays contain some natural nonplastics (Shepard 1956). Many require the addition of organic or inorganic material as a temper. It is important that tempers do not expand excessively as this will shatter pottery during firing. Sedimentary rocks tend to have a very wide range of expansion rates (Arnold 1985). This suggests that, in areas where clay quality is marginal, sedimentary rock fragments may often be unsatisfactory for temper. If suitable alternatives were unavailable, this could place extreme demands on the potter's skill and special adaptive techniques would be needed to transform substandard raw clays into a suitable potting material. One strategy employed by prehistoric potters involved the manufacture of artificial temper, or "grog" (Hodges 1965).

To manufacture grog, the potter is required to invest extra time and fuel resources than needed if readily available natural tempers are procurable. Thus we can be reasonably confident that grog was developed in response to a lack of local alternatives. We have noted above that this is most likely to have occurred in sedimentary regions. Once adopted, however, the grog tempering method provides a degree of resource independence. The essential ingredients needed to make pottery from imperfect clays are temper, fuel and water. Only the latter two are required, however, when expertise in grog manufacture is acquired.

This report will explore two aspects of the sedimentary source zone phenonmenon. Primarily it tests the value of the "geological technique" in a region which includes large areas of sedimentary terrain. This region contains some clays which are difficult to differentiate mineralogically. Secondly, by identifying different technological responses prehistoric potters made to the demands of clay materials, the value of illuminating technical changes is considered.

We have noted that manufactured temper has been associated with the special requirements of making pottery in sedimentary regions. Evidence presented in the following chapters shows that, in prehistoric Thailand, two different kinds of grog were made. In both cases they are normally distinctive. Thus, instead of the mineralogical definition of pottery fabrics, differences in grog species allows for differentiation along technological lines. We can use this

method of distinguishing fabrics in addition to the mineralogical approach. When an indistinct mineralogy means that possible sources cannot be suggested, the technological definition can be helpful in indicating broad source areas. This is because the distribution of the two grog species is at different times mutually exclusive to certain well defined geographical regions. The distribution of these grogs, and their related technologies, changes with time.

Because some fabrics are mineralogically and technologically distinctive, it has been possible to trace the movement of exotic pottery, manufactured under the rubric of one grog tradition, into a region where only the other temper was made. This evidence has complemented geological information and allowed an assessment of cultural change through the identification of different responses to the same tempering requirements. Thus these data have provided evidence of cultural change, related to the production and exchange of pottery, and postulated movements of people, by combining two different approaches to the same technological problem. Following the introduction of the new pottery, a large-scale change in production occurred in association with a wide range of persuasive evidence for culture change, both within Ban Na Di and the surrounding region. The ceramic developments relate to many non-ceramic aspects of cultural process in Northeast Thailand and, together, they present a coherence which suggests the relationship of pottery to prehistoric communities is a subject worth recognition for the light it can shed on past societies.

Not the least of the relationships between the changes in pottery and non-pottery technology at Ban Na Di is an associated change in metal working accoutrements used in melting bronze. This is accompanied by the first firm evidence for working with iron, and probably marks the movement of people from a much larger southern region. The change also heralded participation in an expanded exchange network. Again these developments are evidenced by both ceramic and non-ceramic information.

The present report concentrates on the site of Ban Na Di within the Sakon Nakhon Basin, but sites both within the larger Khorat Basin and beyond the margins of the Khorat Plateau will also be touched on (see fig. 1.2 and fig. 1.3 on pages 6 and 7 respectively). In the next chapter we will review previous ceramic studies in Thailand with a view to bringing into focus the aims of the present work.

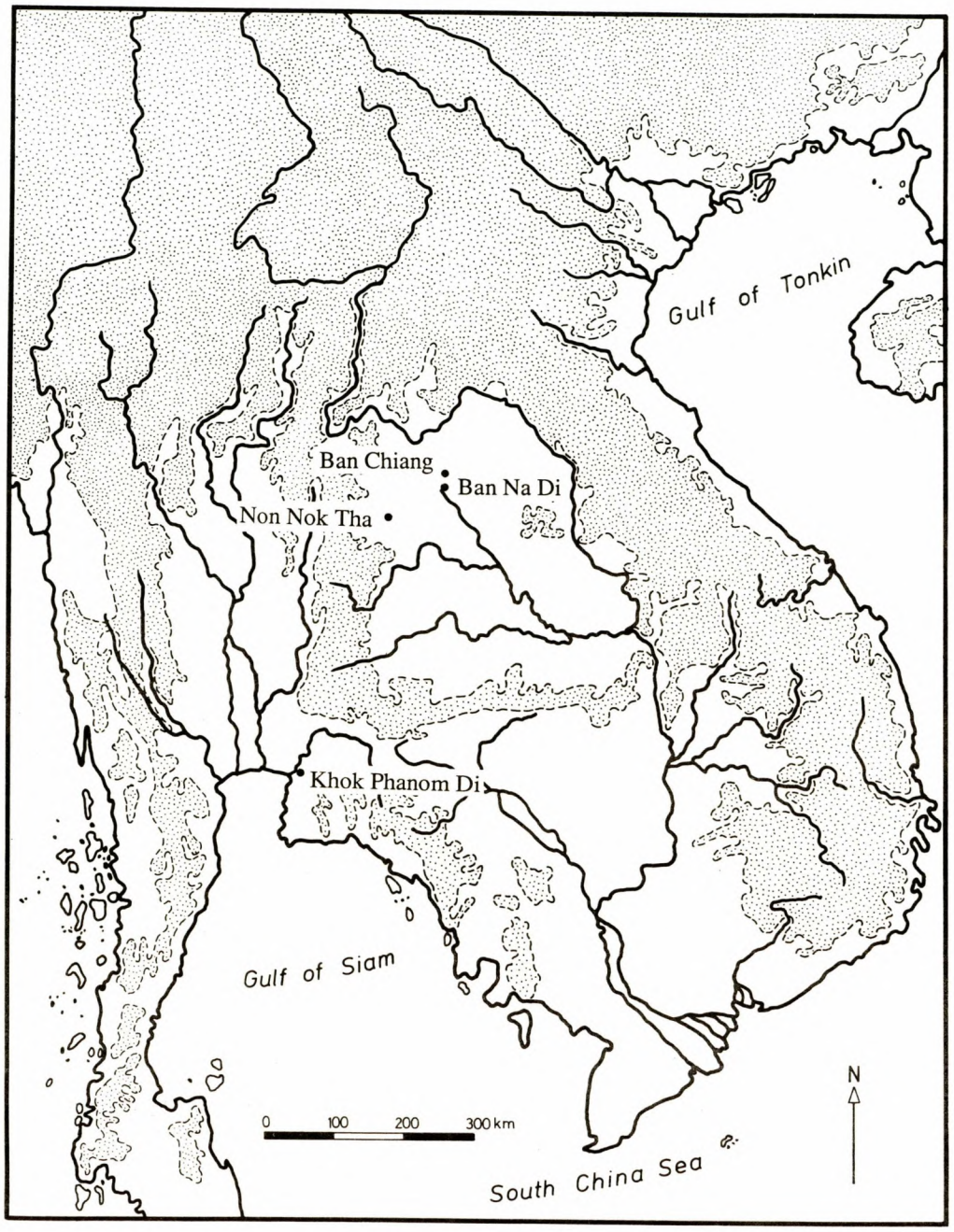

FIGURE 1.1: GENERAL MAP OF SOUTHEAST ASIA

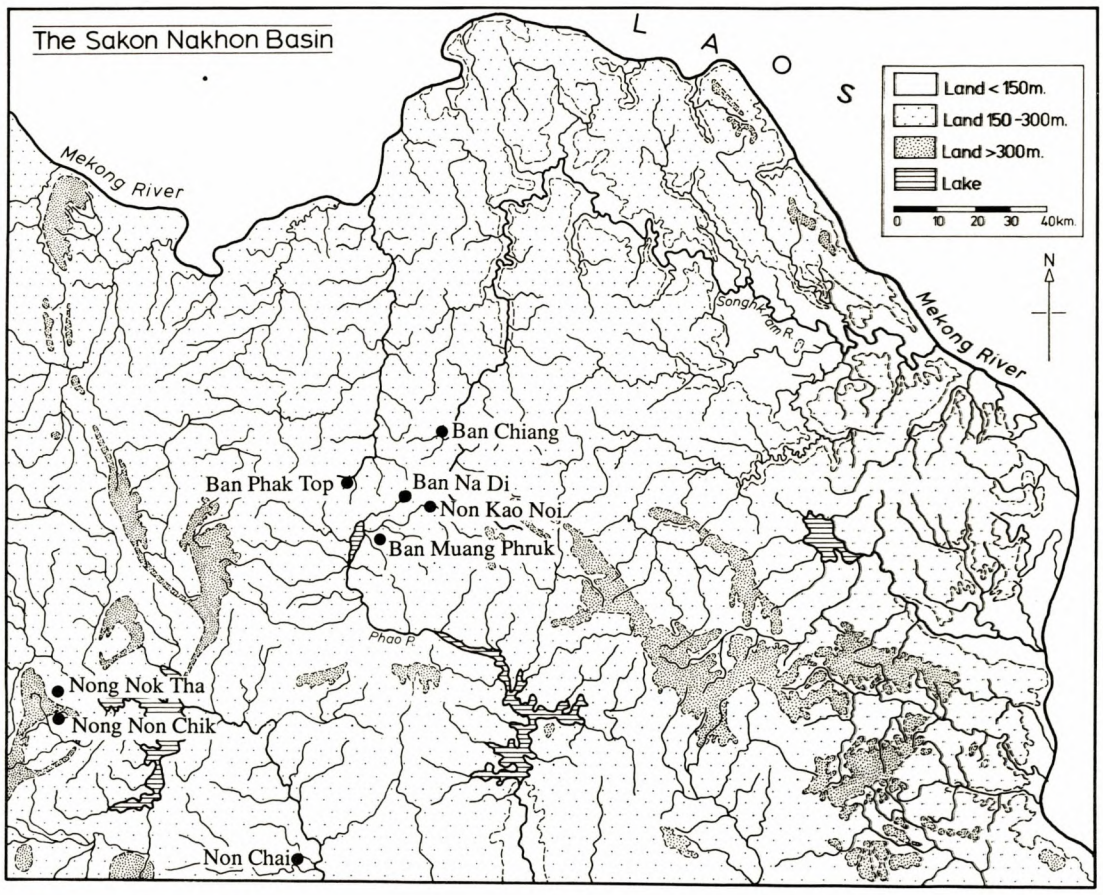

FIGURE 1.2: GENERAL MAP OF THE SAKON NAKHON BASIN

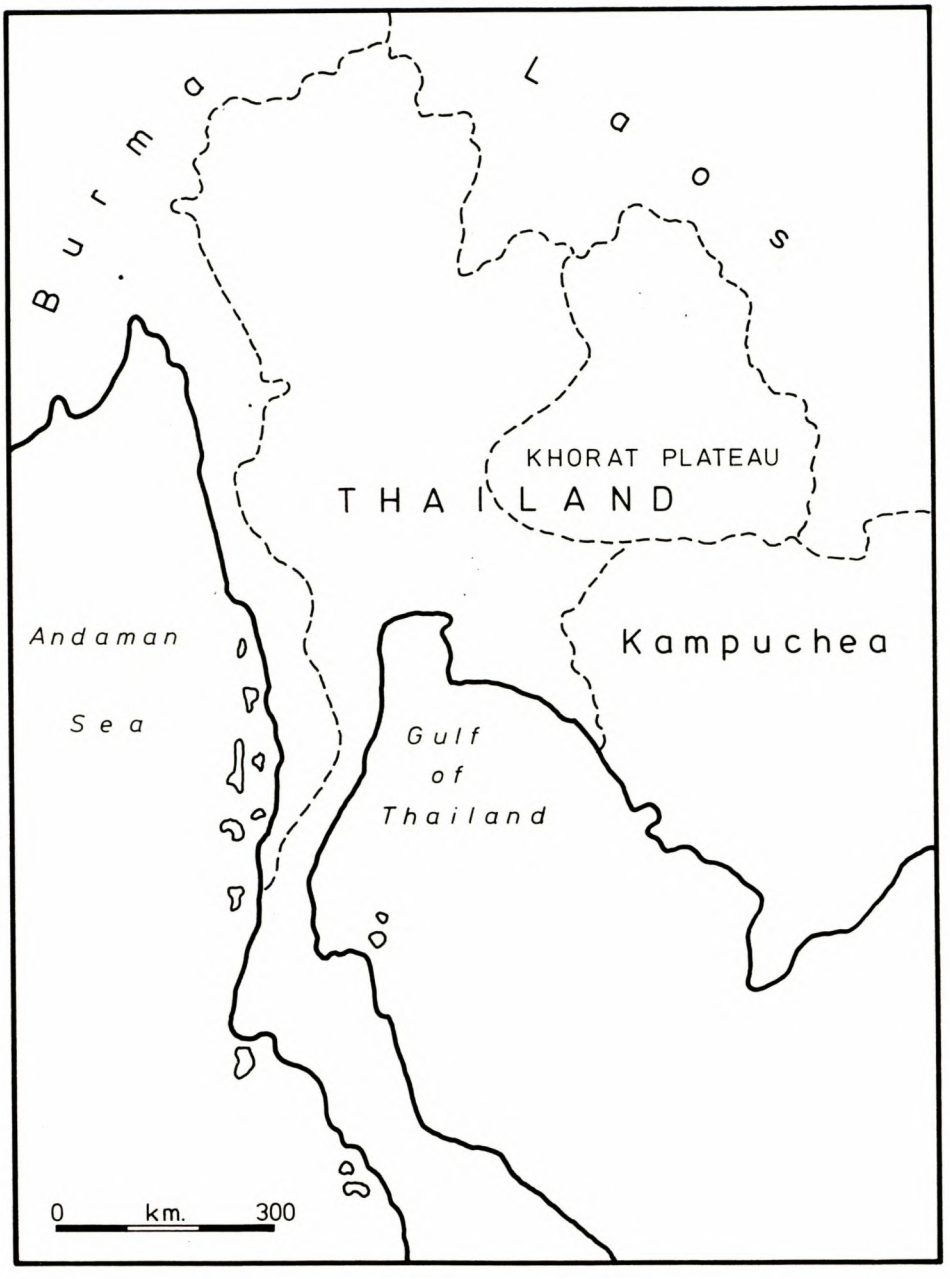

FIGURE 1.3: GENERAL MAP OF THAILAND

Chapter 2

A review of previous studies

2.1 Introduction

Former studies of prehistoric Southeast Asian ceramics share many of the inadequacies displayed by ceramic research undertaken elsewhere and upon which much prehistoric research in Southeast Asia has been based. With very rare exceptions most of these studies are concerned with aspects of pottery style. Such stylistic perspectives suffer from shortcomings inherent in the researcher's perception when assessing physical phenomena. These influences affect all analyses which emphasize an artefact's superficial physical appearance. In addition, they may be biased by the researcher's natural subjectivity. Ceramic artefacts are affected by a wide variety of many physical and sociological factors. Their inter-relationships are embodied in pottery. These parameters will be discussed prior to reviewing earlier studies in order to demonstrate the need for more detailed information.

Of all artefacts available to archaeologists, pottery has probably suffered most from subjective classification. Shepard (1971:98), discussed the nature of this problem, which she termed "pottery sense". She defined it as the "process of organisation of impressions". Tension between objective methods and pottery sense underlies many of the inadequacies in ceramic analysis. Thus, despite rigorous efforts to be objective, attention may unconsciously be drawn to qualities defined by the immediate interests. Emphasis on readily identifiable variables, made at the expense of others, may lead to distortions in perception which amount to a process of selection by omission.

Ceramics share with lithic artefacts a high degree of durability and this has given both considerable prominence in classification studies. In practical terms, potting clays possess potential to be fashioned into an almost infinite variety of forms. By contrast, durable lithic artefacts can often only be fashioned into a limited range of forms, without an input of high levels of energy and/or technology. These limitations reflect constraints imposed by physical forces which act to shape durable rocks (Flint and Skinner 1977). Thus dependent upon the prehistoric material under consideration, two possible parameters appear inevitable:

1. A finite range of (known, or unknown but potentially determinable) forms will exist.
2. An apparently infinite variety of forms exist.

Even with hand-crafted methods, an almost infinite variety of pottery forms are possible. In order to demonstrate this, it is necessary to consider the variables which influence pottery form.

We commence with the need to distinguish between two major parameters, those imposed by technical and those affected by socio-cultural factors. In the latter group are temporal, areal,