

THE SOUTHERN SILK ROAD

Archaeological Evidence of Early Trade between India and Southeast Asia

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Introduction

In the popular imagination the term “Silk Road” conjures up memories of the great caravan trail by camel and pack horse from Loyang in Northern China across the high arid plateaux of Central Asia to Iran, India, southern Russia, and the Near East. But there were other routes, and scholars working in Southeast Asia are more concerned with the trails south from Yunnan into Vietnam, Thailand, Laos, and Myanmar, and of course the great “Sea Road” from the coastal ports of southern China along the Vietnamese coasts, round Cape Ca Mau into the Gulf of Thailand, to the Straits of Malacca, and the portage routes across the peninsula linking this trade with the shipping routes across the Bay of Bengal to India and the west.

As an archaeologist working in western Thailand over the past decade I have been particularly concerned with the evidence for the start of trade contacts between India and Southeast Asia. I believe that there is now evidence to show that regular commerce across the Bay of Bengal began much earlier than we have hitherto believed, and that we have to look back into prehistory, using the methods of field archaeology, to identify its earlier stages and understand its logic.

When we speak, in historical terms, of contacts between India and Southeast Asia we think first of “Indianization,” that massive and complex process which, starting perhaps about the beginning of the Christ-

ian Era, led to the transfer of so many aspects of Indian culture eastwards across the Bay of Bengal. This is an immense field of research which I can only just touch on since my primary concern is to examine the archaeological evidence in Southeast Asia for the very beginning of this process, and to seek an explanation for it.

The influence of Indian Hindu-Buddhist civilization in Southeast Asia from the middle of the first millennium A.D. is undeniable and found almost everywhere except in the remote and forested interior of the mainland or in the eastern islands of Indonesia and the Philippines. From this time on there was an increasing adoption of Hindu and Buddhist cults and, as archaeological finds witness, numerous religious monuments and icons, the latter imported from India or modeled on Indian prototypes. We have evidence for the use of Indian scripts and languages, at least for political and religious propaganda; and some ambiguous external historical sources, Chinese and Indian which record the process of Indianization. These data are presented and analyzed in numerous books and articles, of which I refer specifically to Coedès, Wolters, Wheatley, Mabbett, and Ray.¹ Before the mid-first millennium A.D., however, the data are much more meager, and until quite recently there were very few material items of undoubted Indian or Mediterranean manufacture found in Southeast Asia in contexts which suggested (for the specific context of deposition and recovery was always imprecise) that they reached there before the early centuries of the Christian era. However, the acceleration of archaeological survey and excavation in Southeast Asia, and particularly in Thailand, over the past twenty years has produced quite a number of pieces: beads, bronzes, seals, coins, an ivory comb, ceramic vessels and so on, of western origin which can help us to extend back to at least the middle of the first millennium B.C., the physical evidence for regular exchange systems spanning the Bay of Bengal. This should not really surprise us since the scale of Indianization in the first millennium A.D. was so vast that scholars have long argued that it must have been preceded by an extended period of regular, but less intense (and archaeologically less visible) contacts.

There are also arguments being put forward from the evidence of the new archaeological work in Southeast Asia that some indigenous societies of the region, particularly those with developed metallurgy and extensive flooded-field rice agricultural systems, were already developing stratified, territorially organized, semi-urbanized "states" in northern Vietnam and northeast Thailand, quite independently of stimulus or diffusion from China or India.² Certainly it is clear that traditional societies throughout most of western Southeast Asia were undergoing a dramatic process of restructuring from early in the first millennium A.D. This included demographic, political, and mercantile centralization,

with the appearance of true urban forms which, when they became quite evident on the ground, were organized into kingdoms formally subscribing to Indian principles of polity.

Indo-Roman Trade

That Indianization in Southeast Asia was closely linked to trade seems clear from the elusive Indian historical and mythological sources,³ much of which was by sea.⁴ Voyaging to Suvarnabhumi or Suvarnadvipa, the fabled Lands of Gold was, according to the Indian historical accounts, a hazardous undertaking and “shipwreck, ordeal by scorching sun, tempest, hunger and thirst, as well as plagues of serpents and insects” were among the perils to be expected by travelers. It is clear that these were speculative mercantile voyages for commercial profit, financed by merchant guilds in many parts of India. Kautilya, in the *Arthashastra*, that famous manual of advice for achieving worldly success, originally compiled in the fourth century B.C., ranks the pursuit of profit above all other goals of life, even the paths of virtue and love. As a later writer put it: “Who goes to Java, never returns. If by chance he returns then he brings back enough money to support seven generations of his family.” Most of the existing Indian texts seem to have been compiled, in their surviving forms, only in the early centuries of the Christian era but are thought to reflect a reality of Indian-Southeast Asian voyaging established in the late centuries of the pre-Christian era. In them Suvarnabhumi is reported both as a place for profitable trading and as a field for Buddhist proselytization. At least three missionaries, Gavampti, Sona, and Uttara, are named in the text *Sasanavamsappadipika*; the last two are said to have been despatched by the Emperor Asoka to convert the people of Suvarnabhumi soon after the third Buddhist council in the middle of the third century B.C.

I emphasize these Indian historical sources because, in the context of Southeast Asian prehistory, it is important for us to appreciate that the late prehistoric period saw the expansion of a complex and powerful mercantile system into an area in which trade networks certainly existed; but for which the most appropriate models are the ethnographically-known reciprocal exchange cycles of eastern Melanesia-Kula, Vitiaz Strait, Mailu, and others.⁵ Ray argues that the middle of the first millennium B.C. saw the rise of specialized trading communities (*vanijas* and *setthis*) in the middle Ganga Valley dealing in salt, textiles, metals, and pottery.⁶ Money was increasingly coming into use and this was associated with the spread of the new cults of Buddhism and Jainism which accepted the accumulation and reinvestment of wealth; this concept was

quite alien to the culture of the Vedic period in which reciprocal exchange of the “prestige goods” type was the normal method of distributing exotic and luxury items. Long-distance trade between the agricultural hinterland of the middle Ganga Valley, the ports such as Tamralipti (Tamluk) in the Ganga Delta, and those at the mouth of the Narmada Valley such as Broach (Barygaza of the *Periplus*) developed rapidly at this time, and the gemfields and gold-rich deposits of south India were quickly integrated into this trade.

By the early part of the Christian era these trade routes reached out to bring together the previously rather disparate Southeast Asian exchange systems, linking them into a vast network stretching from Western Europe via the Mediterranean Basin, the Persian Gulf, and the Red Sea to India, Southeast Asia and China. This period saw the first appearance of what has been called the World System—the economic integration by trade of most of the inhabited globe, excepting the Americas and Australasia, and its significance for the subsequent development of Southeast Asian societies cannot be ignored.

Before examining the archaeological evidence for these early links between the mainland of Southeast Asia, particularly Thailand and India, I must briefly consider the development of commercial trading systems further west and specifically those linking the Indian subcontinent with the civilizations of the Mediterranean Basin, and also the emergence of simpler exchange systems within the greater area of Southeast Asia, from Thailand and Vietnam in the north, to the islands of the Philippines and Melanesia in the south and east.⁷ Ray presents the evidence for the development of trading systems down the east coast of India,⁸ and other authors present up-to-date accounts of specialized aspects of Indo-Roman trade, so I will be brief and general in this section and try to emphasize the implications of this trade for contacts across the Bay of Bengal.

Indo-Roman commercial undertakings seem to have been highly organized and are quite well documented in Classical writing dating from the second century A.D. even though there is much uncertainty about details. Revisions are regularly proposed for dating the growth of this trade from the evidence provided by the excavation of archaeological sites,⁹ which help to amplify the historical sources. I would also argue that virtually all new data on this trade are likely to come from archaeology, which has barely started to research the problem, rather than from literary and historical sources, which seem to be finite and mostly known.

The great expansion of Southeast Asian, and particularly of Island-Mainland exchange, which is evident in later prehistory is, I believe, closely connected with this Indo-Roman commerce. It can be explained

in part, at least, by a rising demand for exotic and prestigious items of consumption and adornment in the sophisticated urban civilizations of the Mediterranean Basin, India, and, of course, China; I refer to that “splendid and trifling” trade in spices, perfumes, precious stones and pearls, silks and muslin, tortoise-shell, ivory and rhinoceros horn, dyes and unguents, ghi, lac, and so on scorned by the high-minded Gibbon for undermining republican virtues.

As an example of the demand for exotic products in the west we need only to look at the spice trade,¹⁰ and particularly at the trade in cloves—the unopened flower-buds of the plant, *Eugenia aromatica: kuntze*, whose home was restricted (until the late eighteenth century A.D.) to the small islands of Ternate, Tidore, Motir, Makyan, and Bachan in the Moluccas.¹¹ Cloves were known in China in the third century B.C., and were described by Pliny in Rome in the first century A.D.¹² At the production end, the trade in cloves, nutmeg, and mace transformed Moluccan society from scattered kin-based communities of hunter-gatherers and shifting cultivators to stratified coastal trading states and petty empires. As Ellen points out, “It was the spice trade which was partially responsible for the Indianization of Southeast Asia and which facilitated the spread of Islam. It was responsible for the growth and demise of numerous states on the commercial routes from the Indies to the Mediterranean ... and led to the first serious involvement of Europeans in Southeast Asia and the formation of colonial empires there.”¹³ So this Western demand for an aromatic flower-bud of rather little value to the native peoples of the Moluccas transformed, in the long run, the economic and political face of Asia. Of such small things are empires built.

Of course there was trade too in everyday raw materials to supply workshop centers servicing the trade, and foods such as sugar and rice, as well as in timber, metals and metal ores, and in manufactured products such as pottery, textiles, sewn boats, glassware, and steel. But the volume of these was probably not great, for ships were small¹⁴ and it is almost certainly true that the demand for low-bulk, high-value luxuries drove the trade.

In India there is abundant physical evidence of this trade in the form of Mediterranean amphorae and Italic Arretine ware on the South Indian coast, Roman gold coin hoards throughout South India, numerous Classical intaglios and seals throughout southern India and Sri Lanka, and Mediterranean lead in the Satavahana coinage of Central India.¹⁵ In the Mediterranean, although Asian imports have largely disappeared (slave girls and elephants) or decayed beyond recognition (silks and cotton, wood and lacquer), or are difficult to source (gold, gemstones), we have a remarkable reminder of this trade in the form of an

exquisite Indian ivory figurine from the first century A.D. found buried under the ash of Pompeii.¹⁶

But what we lack in identifiable artifacts is more than made up by the wealth of textual data. For instance, we have detailed contemporary and product-specific descriptions of the structure of the trade in the *Periplus*, in Strabo's and Ptolemy's *Geographies*, and Pliny's *Natural History*. The material available has enabled historians such as Warmington, Miller, and Raschke, and archaeologists such as Wheeler to develop a comprehensive and, on the whole, convincing structure for the trade between India and the Roman world as it existed at the beginning of the Christian era.¹⁷ These exchange systems were more developed than the ones I have described for Southeast Asia and approximate to Renfrew's "Middleman Trading" and "Port of Trade" modes.¹⁸ And in many cases, particularly at the western ends of the trade routes, these were entrepreneurial ventures, undertaken for commercial profit, facilitated by the use of coinage, and underwritten by accumulated capital.

Eastwards from India, however, the data, historical and archaeological, becomes much more sparse. Indeed, Wheeler was unwilling to extend to Southeast Asia the well-structured trading systems which he could describe for India and the Erythrean Sea. He attributed the few Western-derived items found up to that time in Thailand and Vietnam to what he called "drift," by which apparently he meant movements of objects through intermittent, short-distance reciprocal exchange networks.¹⁹ Certainly Wheeler did not believe that the well-organized mercantile commerce of the Indian Ocean extended at that time across the Bay of Bengal. Raschke too is doubtful whether commercial links between India and Southeast Asia were on a regular basis until well into the first millennium A.D., that is to say between about the third to sixth centuries A.D.²⁰ The Western items they refer to are, of course, the famous Pong Tuk lamp from a monastic site on the north bank of the Mekong River in western Thailand, a coin of Antoninus Pius, some inscribed gemstones, rings, medallions and statuary from India, and the Mediterranean seals at Oc-eco and other locations in Vietnam.²¹ Since then quite a few other finds have been made or recognized and these are enough, I believe, to permit us to argue that regular exchange links between India and Southeast Asia commenced earlier than Wheeler or Raschke allowed. It is unclear, however, whether we can refer to this as trade, specifically a commercial exchange entered into for financial profit, or an extension of the "Big Man" prestige goods reciprocal type of economy which is so well-documented for recent Melanesia, and postulated below by me for earlier societies within Southeast Asia as well as for many other parts of the prehistoric world.²²

Since Wheeler wrote, further finds of Western artifacts, for the most part casual, unprovenanced discoveries, have been documented in Southeast Asia, and later I list these and then present in a little more detail the recent evidence from the site of Ban Don Ta Phet in Thailand, which has produced the most abundant evidence to date for early Indian links with Southeast Asia.

Later Prehistoric Exchange Systems and Maritime Transport in Southeast Asia

In writing about the beginning of this process in Southeast Asia, I use the term “Later prehistory” which I find usefully vague in light of our poor control over regional chronologies, but by which I mean more or less the last millennium before, and the first few centuries after the opening of the Christian era. This coincides roughly with Bayard’s “General Period C” on the mainland of Southeast Asia,²³ but many of the technological and social criteria by which they define the period on the mainland—the use of iron, the development of intensive wet rice farming, and increased social ranking—are as yet undocumented in island Southeast Asia.

I think that it can now be accepted that by the middle of the third millennium B.C. substantial improvements had been made in maritime technology in Southeast Asia, and that long distance voyaging in double- or single-hulled outrigger canoes and plank-built boats was taking place. This period saw the expansion of pottery-using, agriculture, and probably of Austronesian-speaking peoples throughout island Southeast Asia.²⁴ This is particularly well-exemplified on the eastern margins of our region by the rapid colonization of many previously uninhabited islands in the western Pacific, such as Fiji, New Caledonia, New Hebrides, Tonga, and Samoa. Westward voyaging from Southeast Asia at this time is less obvious; indeed the real evidence is negligible. The distribution of Munda (a language related to Mon-Khmer in the Austroasiatic family), cord-impressed pottery, and shouldered adzes in eastern India—in Assam, Bengal, parts of Uttar Pradesh, Bihar, and Orissa—is more likely to be the result of a long-established and continuous distribution of related cultures from South China and Vietnam, through Thailand and Burma into India, than the product of maritime or even land-based trade routes. There is no evidence I know of for direct long-distance trade between Southeast Asia and India before the Iron Age, which in eastern India begins about 750 B.C. and a couple of hundred years later in Thailand according to present, albeit rather poorly supported, chronologies.²⁵

The only hard evidence, up to now, for Western maritime connections with Southeast Asia is the so-called Indonesian Presence in East Africa and Madagascar. Received opinion, supported by new archaeological work, seems to put this as late as the middle of the first millennium A.D., the Early Historic period for many western Indonesian cultures.²⁶

In an earlier paper, I summarized the evidence for the emergence of localized exchange networks in Indonesia in the neolithic and early metal age periods (roughly from mid-third to late first millennium B.C.), and Peacock did the same for western Malaysia.²⁷ More recent evidence from the mainland of Southeast Asia also demonstrates the development of this localized exchange in raw materials and exotic products in the second millennium B.C. The social context in which these exchanges took place is still obscure, but I envisage it to be in the form of "Boundary Reciprocal" or "Down-the-line" exchange of the sort formalized by Renfrew.²⁸ In particular we can point to the presence of arm-rings (and the raw material for making them) from such marine shell species as *Trochus* and *Tridacna* at inland sites in Central Thailand such as Kok Charoen, Ban Kao, Ban Na Di, and Tha Khae (Natapintu); and Obluang in the northwest (Santoni et al); exotic stone for arm-rings at Ban Na Di and other sites in the northeast (Higham and Kijngam); hard volcanic stone suitable for making polished adzes from the hills of the Thai-Cambodian border into the coastal lowlands (Pisnupong); and the import of lead, tin, and copper ores and metal to sites such as Ban Chiang and Non Nok Tha, also in northeast Thailand (Pigott and Natapintu; Bennett). Similar evidence is available for the late neolithic Phung Nguyen and early bronze age Go Mun cultures of Vietnam (Ha Van Tan).²⁹

New Archaeological Finds from Southeast Asia Bearing on Trade with the West

Quite a few of these items are, like the earlier discoveries mentioned above, casual finds without good provenance, but increasingly material is coming from controlled excavations where the finds can be dated and related to other material in burials, habitation refuse, and so on. Taking some of the casual finds first, we should note the following discoveries in Thailand.

A copper coin of the western Roman Emperor Victorinus (A.D. 268-70), minted at Cologne, was found at U-Thong in western Thailand (Landes),³⁰ and is preserved in the National Museum there.

The site of Khlong Thom (also known as Khuan Lukpad or "bead mound") in Krabi Province, southern Thailand has become famous for

its rich collection of glass and semi-precious stone beads, and rather notorious for the means by which most were acquired. In an attempt to salvage some reliable information, several programs of survey and limited excavation were conducted by Thai and foreign archaeologists between 1973 and 1986. Veraprasert and Bronson document the history of investigation of the site and list and illustrate some of the finds.³¹ Among the ones which particularly concern me here are a number of etched agate and carnelian beads—a carnelian bead in the form of an animal, probably a lion, resembling, though smaller, the one discovered by us at Don Ta Phet (see below); glass “collar beads” similar to those from Arikamedu; a defaced Roman coin, apparently not datable;³² and at least two, perhaps many more (Bronson pers. com.), Roman carnelian intaglios. Two of these portray the Goddess Tyche or Fortuna, and a pair of fighting cockerels. Both are common Roman types and can be dated to the late first to early second centuries A.D.³³

Bronson also refers to other intaglios with scenes of elephants, a lion, the god Perseus, an unidentified woman, and some seals with Pallava inscriptions. Some of these seals are purely Classical while others are undoubtedly Indian.³⁴ Most are kept in the Wat Khlong Thom in the care of Abbot Phrakru Arthorn Sangwornkij. Amongst the glass from Khlong Thom, Veraprasert refers to rim fragments of a blue glass container “very similar to Roman glassware,” and both Veraprasert and Bronson document the evidence for the local manufacture of glass and stone beads in addition to those presumably imported as finished pieces. Bronson describes the site as more of a specialized manufacturing center than an entrepôt; a place where expatriate (Indian) craftsmen worked under the protection of an enterprising local ruler, importing some raw materials (glass cullet and agate blocks) as well as finished goods (beads and seals). There is also evidence for tin smelting, perhaps for export to tin-short India. The activities at Khlong Thom lasted over several centuries and not all of them can be ascribed to the very early days of trade across the Bay of Bengal. And the isolation of the site from major population centers and urban sites with monumental architecture makes it difficult to fit it into existing categories such as “port of trade,” “central place for exchange,” and so on. Bronson sees Khlong Thom more as a “Colonial Enclave” in Renfrew’s scheme,³⁵ as some type of early offshore technology park set in a tropical wilderness and, in doing so, he highlights the unusual features of the site as well as how little we really know about the structure of trade between India and Southeast Asia at this time.

Increasing numbers of etched beads are being reported in Thailand, particularly from museums in the south. These include single specimens from Ban Chiang and Saraburi and about twenty-five from the region around U-Thong.³⁶ However, few of these have been verified by archae-

ologists really familiar with Indian stone beads and, in some cases, these have turned out to be banded glass beads.

Artifacts found in Malaysian archaeological sites which are undoubtedly derived from the west are few and ambiguous, both as regards their provenance and identification. The most significant site is Tanjung Rawa, Kuala Selinsing, Perak on the west coast of Peninsular Malaya.³⁷ The site appears to have been a low island at the mouth of the Selinsing River, perhaps a fishing and trading settlement of pile houses over a muddy bank seasonally flooded. Finds include wooden coffins, or "boat" burials; abundant pottery, some of which parallels that from the proto-historic "Funanese" trading port of Oc-*eo* on the Vietnamese coast and the Pontian boat burial (see below); glass, stone and shell beads and bracelets, fragments of dammar, gold and tin ingots; and items of jewelry, pieces of glass cullet, and etched beads which most probably are western.³⁸ More specific finds include an Indian gold ring with a Hindu motif, a carnelian seal bearing a Sanskrit inscription dated palaeographically to the fourth-fifth century A.D., and glazed Chinese ceramics. Radiocarbon dates suggest that the site was occupied from at least the third to the seventh or eighth centuries A.D. and are generally in agreement with the archaeological finds. The Kuala Selinsing site is comparable to Khuan Lukpad at Krabi in its big range of exotic material, most of which is surely dated to the early to mid-first millennium A.D., but some could just as easily be several hundred years earlier if we had more information about the specific context of discovery.

The Pontian boat burial,³⁹ which contained Oc-*eo* style high-fired combed grey ware ceramics has recently been dated by radiocarbon to the second century A.D. This dating suggests that some of the Kuala Selinsing material may be rather earlier than the radiocarbon dates indicate.⁴⁰ Finally, I must mention the site of Bukit Tengku Lembu in Perlis which contained fragments of a high-fired polished black pottery which has variously been described as "Greek" and Indo-Roman Rouletted Ware.⁴¹ Unfortunately this material, while it certainly seems to have been made in antiquity west of the Bay of Bengal, lacks a good context, having been dug out by farmers seeking fertilizer, and is not very precisely described or illustrated.

Indonesia has also produced some artifacts traded from the west, such as the few shards, and at least three virtually complete vessels of Indo-Roman Rouletted Ware of the first century A.D. which were recognized in the National Museum, Jakarta, by Walker among pottery belonging to the Buni grave complex on the north coast of Java.⁴²

Then there have been some occasional finds from well-excavated and published sites in Thailand, Burma, and Indonesia. Among these we should first note an Indian ivory comb from the moated settlement at

Chansen in Central Thailand. This comes from a good context in Period II which the excavators, Bronson and Dales⁴³ dated to between the first and third centuries A.D. This piece is now on exhibition in the National Museum, Bangkok.

Excavations at Beikthano in Central Myanmar⁴⁴ have provided convincing evidence for a town with a palace and stupas based on Indian Buddhist models. Among the finds are one etched bead (see the discussion below) and a number of Indianizing Pyu coins. The excavator with the aid of four radiocarbon and stylistic comparisons with various Indian architectural prototypes dates the site to the first-fifth centuries A.D.; but the coin evidence⁴⁵ suggests that Beikthano was occupied well into the eighth century A.D.

In west Bali, Indonesia, the site of Gilimanuk has been excavated over a number of years by Soejono,⁴⁶ and has produced the most abundant evidence yet for the introduction of iron, copper, and bronze tools and ornaments in Indonesia, and for contacts with the west in the form of glass and semi-precious stone beads.⁴⁷ The site has been dated to the turn of the Christian era.⁴⁸ But the most exciting recent discoveries in Bali come from the work of I.W. Ardika at a number of sites on the north coast, just below the modern village of Sembiran.⁴⁹ There, in levels below structures and occupational debris which he relates to the trading port mentioned in the ninth century A.D. Julah inscription, he has found abundant traces of an earlier coastal settlement associated with substantial quantities of the Indo-Roman rouletted ware, a shard of Wheeler's Type 10 stamped and polished black ware from Arikamedu, and one shard with characters written in Karoshti, a script previously known mostly from Northwest India and Pakistan, but not being found in some frequency along the Ganga Valley and at trading stations in Bengal and Southern Thailand.⁵⁰

In February 1993, during a joint excavation with Vietnamese archaeologists, one shard of this rouletted ware was found at the base of an excavation at Tra Kieu, the ancient Cham capital of Simhapura in Central Vietnam.⁵¹

Further east in Indonesia and even into New Guinea, recent excavations have produced a few copper and bronze tools and ornaments from datable contexts, and these suggest that small quantities of metal were being taken east along well established trade routes from at least the second century B.C.⁵² This evidence suggests to me that the spread of the fifteen Heger 1 bronze drums and fragments which are now documented from eastern Indonesia⁵³ could have been quite early. Spriggs and Miller⁵⁴ suggest the third century A.D. as a likely date for this "late Tonkin" group of Heger 1 drums, and this is entirely plausible.

Finally, I should mention another category of evidence—animal bones—which were found in a series of prehistoric deposits in caves which I excavated in the eastern part of the small island of Timor in Indonesia in 1966-1967. In levels dating from the middle of the third millennium B.C., and over the next 4000 years, I found the remains of animals foreign to this isolated and biologically impoverished island: pigs, monkeys, civet cat, phalangers, dogs, goats, cattle, deer, and horses. The presence of goat bones, almost certainly of immature domesticated goat (*Capra hircus*), in several caves from the late second or first millennium B.C. onwards, were a surprising discovery.⁵⁵ Goats (other than the Serow (*Capricornis sumatraensis*), which is distributed throughout the mountains from the Himalayas east to China, and south to Sumatra) have never before been reported from archaeological sites in Southeast Asia. It has been thought that the spread of this animal is quite recent and was associated with the expansion of Islam with its preference for goat meat rather than the despised but traditional Asian pig; but the evidence from Timor shows that they were introduced into the seasonally dry eastern islands of Indonesia much earlier than this. We have to look west for the sources for these goats and the logical place is Peninsular India where goats appear in small numbers in Indus Valley Culture sites, and rather more frequently in the chalcolithic cultures of Maharashtra, and in southern neolithic cultures, between the mid-second and first millennium B.C.⁵⁶

Although not all are so securely dated, the newer finds described above add substantially to the body of material demonstrating contacts between Southeast Asia and the Indo-Roman world from at least the last few centuries B.C. into the early centuries of the Christian era.

Finally, in this section I want to present some of the relevant material from a late prehistoric Iron Age site in western Thailand which has been excavated on quite a large scale between 1975 and 1985 and which has yielded a large corpus of finds deposited over a very short time in the early fourth century B.C. A lot of this material is directly relevant to the question of exchange between India and Southeast Asia and, I believe, helps to put the process of Indianization into better focus.

The Cemetery of Ban Don Ta Phet

The archaeological site of Ban Don Ta Phet lies between Kanchanaburi and U-Thong in west-central Thailand. The village is on a low mound rising above low swampy ground which is today under rice and sugar cultivation. Antiquities were found there by school children in September 1975 and excavations were undertaken by the Thai Fine Arts Department between November 1975 and May 1976. A number of funerary deposits were identified, richly equipped with iron tools and

weapons, bronze vessels, and jewelry made from bronze, bone, ivory, glass and semi-precious stones.

After the Thai work of 1975-1976, two other excavation seasons were undertaken in 1980-1981 and 1984-1985, jointly by the Institute of Archaeology, London, and the FAD, in which further funerary deposits were revealed with a generally similar range of furnishings. As several preliminary reports are available or are in preparation,⁵⁷ I will not repeat the details here. Five radiocarbon dates were determined on organic temper (mainly rice) in pottery. Taking center point figures for these dates, which are statistically the same age, from the calibrations in Stuiver and Pearson⁵⁸ we get a mean of 350-390 B.C., and at the moment this seems the best "single" date to recommend.

There are two categories of finds at Ban Don Ta Phet which provide the evidence for exchange between India and Thailand at this time. These are beads and some of the bronze vessels. Other items which occur in abundance at the site, such as low-fired earthenwares, and the forged iron tools and weapons, are entirely local, even parochial in character.

Beads from Ban Don Ta Phet

More than 3000 beads of glass and semi-precious stone were found at Ban Don Ta Phet, generally in the lower part of each funerary deposit, and mostly at the western end; glass and stone beads were together but erratically spread.⁵⁹ It is worth noting that a substantial number (8.5 per cent) of the glass beads, including most of those made from a translucent clear to greenish glass were in the form of natural mineral crystals of the cubic, octahedral, rhombic, dodecahedral, tetragonal, and hexagonal prism systems. This suggests that the bead makers were quite familiar with natural gemstones and were perhaps imitating them for a provincial market.⁶⁰ From the point of view of contacts with the West, the most interesting of the glass beads are large, translucent green six-sided prisms. Parallels for these shapes in glass are hard to find in the archaeological literature.⁶¹ Beck illustrates two similar prismatic glass beads from Marshall's excavations at the Bhir mound, Taxila (fourth-third century B.C.);⁶² surface collections from Ahichchhatra, Kausambi, and Narhan in northern India contain a few such beads,⁶³ and some were found at Oc-co⁶⁴ and in collections said to come from Ban Chiang in northeast Thailand that are displayed in the Suan Pakkard Palace collections in Bangkok. The Indian parallels for these beads are suggestive, for in form and color they are remarkably similar to the famous beryl crystals of south India that were so popular in the Buddhist cultures of north India as well as the Roman world, and which attracted the attention of Pliny the Elder.

To my knowledge, very few of these translucent pale green hexagonal beads have so far been found at other Southeast Asian sites (Oc-co,

Ban Chiang, and the Pasemah megaliths in south Sumatra are the only other locations I know of) and there is no evidence of glass manufacturing at this time east of India, so there is a probability that these “glass beryls” were made in India and traded into Southeast Asia.⁶⁵ This suggestion makes more sense when the evidence from the etched stone beads and bronzes is taken into account.

Of the 3,000 or so beads found in the three seasons at Ban Don Ta Phet, more than 600 were made of hard, semi-precious stone such as agate, carnelian, rock crystal, and nephrite. By far the most common were spherical carnelians, then small faceted carnelians, cylindrical and barrel-shaped banded agates, small unmodified rock crystals, and small cylinders of jade. All of these beads were drilled for suspension with cylindrical holes 1.0–1.5 mm. in diameter and it has recently been argued that the striations inside the drill holes demonstrate the use of diamond-tipped drill bits such as the ones more recently used by the Cambay bead makers.⁶⁶ The faceted lozenge-shaped carnelians were cut and polished on some sort of wheel, and the spherical and barrel-shaped beads were polished to a very high surface finish. Lamb has already commented on the technical mastery shown by the makers of early Southeast Asian hardstone beads.⁶⁷ Bellwood discusses the distribution of these plain spherical and faceted carnelians within Southeast Asia and summarizes the arguments for, and against, their ultimate source in India.⁶⁸

Probable though it may be that the plain carnelian and agate beads were imported, this is difficult to prove given their ubiquity and simple forms. But among these stone beads there is a particular variety known to archaeologists as “etched beads,” about which there must be less doubt. More than fifty etched beads were found during the three seasons at Ban Don Ta Phet and about an equal number have come from looted sites in the region around U-Thong town, a smaller number from Krabi as noted above, and a few from sites in central and north-east Thailand.⁶⁹

Most of these belong to the well-known Type 1 etched beads as characterized by Beck, Mackay, and Dikshit, on which a white design is etched or stained on the natural red or greyish-black of the polished stone surface.⁷⁰ The technique of etching the surface layers of agate and carnelian extends back to the Harappan civilization of the western part of South Asia in the third millennium B.C. and although etched beads were traded west to Mesopotamia at this time,⁷¹ none of the distinctive Harappan beads have so far been discovered east of the Ganga-Yumna Doab.

Etched beads went through periods of popularity and relative decline in India⁷² although it is unlikely that this very specialized craft died out altogether. After the Harappan period they reappeared in the Ganga Valley between about 600 B.C. and A.D. 200,⁷³ and then came back into fashion among Muslim medieval communities, particularly in

the region from Iran to Sind, although etched beads have been found as far west as Crimea and the Caucasus. The etched beads from Ban Don Ta Phet most closely match those of the second Indian period, as Chin You-di recognized.⁷⁴

Apart from Ban Don Ta Phet and the region around U-Thong, very few etched beads have so far been recognized or published from Southeast Asia and despite the relative lack of systematic excavation in most countries, it is my feeling that they will always be rather rare east of India. However, it should be noted that many more are turning up in Burma, some from early historic cities. In Thailand, I know only of about twenty-five other examples.⁷⁵

Apart from the etched beads, there is one large, and a broken back half, of carnelian pendants carved in the form of a leaping lion which is almost certainly Indian in origin. A similar, but smaller lion pendant was found at Khlong Thom, and small crouching lion pendants are commonly found in the Buddhist reliquaries of the Gandhara Civilization; see, for example, the crystal lion from the Dhammarajika stupa at Taxila.⁷⁶ Numerous other examples of such lions are to be found in museums with good collections of Gandharan material although few are provenanced and dated. Before representation in human form was acceptable (a tradition which developed only from the first century A.D.), Buddha was often shown by one of his attributes such as the footprint, the umbrella of royalty, the empty throne; or the lotus, bull, or elephant to recall the circumstances of his conception and birth, or as a deer to remind devotees of the sermon in the deer park at Sarnath.⁷⁷ However, a particularly common representation was of Buddha as a lion, a reference to him as Shakysimha, or Lion of the Shakya Clan. It is highly possible that the lion bead from Ban Don Ta Phet is an early Buddhist icon, and as such probably the earliest witness to Buddhist ideas and values yet recognized in Southeast Asia.

Finally, I should mention another sort of bead again, probably an import, but this time from Vietnam. This is a pale green nephrite⁷⁸ two-headed animal pendant found inside a bronze bowl in context 324 in the 1985 season at Ban Don Ta Phet. One other bead of this type has been found at or near U-Thong, and is in the National Museum, Bangkok.⁷⁹ Such pendants are a characteristic, even diagnostic, artifact of the Sa-Huynh Iron Age Culture of the central coastal region of Vietnam.⁸⁰

We can summarize the evidence for the beads from Ban Don Ta Phet thus: some, if not all, of the glass and semi-precious stone beads were acquired by exchange from the Buddhist civilizations of northern India. The presence of objects of Buddhist veneration (even though the context of deposition cannot be said to be that of established Buddhist religious practice) gives some credence to the traditional Indian histori-

cal accounts, as preserved for instance in the Mahavamsa and the Sasanavamsappadipika, that Buddhist missionaries such as those said to have been despatched to Suvarnabhumi by the Emperor Asoka were active in Southeast Asia at this time, or even before the reign of Asoka.

Bronze vessels from Ban Don Ta Phet

Bronze was used for three categories of grave furnishings at Ban Don Ta Phet: for containers, bird figurines, and for ornaments such as bracelets, anklets, and small bells. The latter are either very simple forms ubiquitous in Southeast Asia or found only at Ban Don Ta Phet. Some of the bronze vessels, however, present strong evidence for contacts with India, as has already been pointed out by Rajpitak and Seeley.⁸¹ Nearly 300 bronze containers were found in the ninety or so funerary deposits excavated during the three seasons. A full classification of the vessels has not yet been made, but it is clear that there is considerable variation in size, form, and presumably function. There are flat-bottomed cylindrical and waisted canisters, more-or-less hemispherical bowls in various sizes, and a few unique pieces such as a stepped, truncated cone, or stupa-like form, and a large bucket or *situla* with thick walls which is made with a high-lead, low-tin bronze.⁸²

The composition and manufacturing methods have already been mentioned earlier in this paper, and are rather fully discussed by Rajpitak and Seeley, and in Rajpitak,⁸³ so I will only summarize the main points here. Most of the vessels were made of a high-tin bronze (23-28 percent Sn), cast with thin walls, and were then hot-worked, quenched, and annealed to varying degrees. Some vessels had bands of fine incised decoration below the rims and a few included scenes of people, houses, horses, cattle, and buffaloes which remind one of processional scenes on, for example, the famous Kulu vase in the British Museum. Rajpitak and Seeley suggested that this intractable alloy was chosen because of its resemblance to yellow gold when freshly polished, and they point to occasional finds of high-tin bronze bowls in India with similar properties, such as those from Adichanallur in Tinnevely District, Tamil Nadu; Coimbatore in the Nilgiri Hills, and Taxila where Marshall found a number in the Mauryan strata at the Bhir mound.⁸⁴ They refer to an interesting observation made by Nearchus when he traveled through this region with the Macedonian army in the fourth century B.C. and preserved in Strabo's *Geography* that the local people used "brass that is cast, not the kind that is forged ..." with the strange result that "when they fall to the ground they break to pieces like pottery." Such a description fits equally the bowls from the Bhir mound at Taxila and those from Ban Don Ta Phet. Copper-tin alloy artifacts are rare in India (which is deficient in tin) at this period and true brass (copper-zinc), which is not

so brittle, was only just coming into use. Taking these points into account, and the already demonstrated links between Thailand and northern India, it would seem possible that these high-tin cast bronze vessels (which are outside the normal range of Indian metallurgy) were imported from Southeast Asia.

Fragments of high-tin bronze vessels and bracelets have also been identified at a number of localities in Thailand,⁸⁵ and quite recently high-tin bronze bowls with shallow engraved scenes of animals in procession, people, house structures, and lotus leaves radiating from the base of the bowl have been recovered from a site disturbed by tin mining at Khao Jamook near the Thai-Burmese border in Ratchaburi province, west of Bangkok.⁸⁶ These are remarkably similar to the bowls from Ban Don Ta Phet, and the Kulu Vase from Gundla in northwestern India. Batchelor⁸⁷ also documents a number of high-tin, hemispherical bowls which have been found over a number of years in the tin gravels of western Malaya. Unfortunately, these cannot be dated.

Knobbed-base vessels from Ban Don Ta Phet

Most of the bronze bowls are undecorated and flat or gently curved inside, but a number—perhaps twenty to thirty including fragments—are finished on the inside of the base with a series of concentric circles surrounding a conical boss which is sometimes cast integrally with the vessel, and sometimes riveted on.⁸⁸ I know of only one other example of this type of vessel from Southeast Asia, a bronze bowl in the Guimet Museum collections which is reported to have come from the Than Hoa Province of North Vietnam, but in India it occurs in a modified form on at least one of the Nilgiri high-tin bronze bowls now in the British Museum (Breeks); on a silver dish from Taxila (Marshall); and it is replicated in pottery in the “knobbed ware” first identified at Sisulpalgarh, an early historic town site in Orissa (Lal).⁸⁹ In the past thirty years or so, this distinctive ceramic form has been recognized at over a dozen sites in Bengal, Orissa, and the Ganga Valley. It occurs in a variety of fabrics but seems to be most common in a late phase of Northern Black Polished Ware which can be dated to the last centuries before the Christian era.

The function of these knobbed-base vessels is not at all clear; for the most part, the excavators in India have been satisfied to describe the form, attributing them to a fabric class, noting their stratigraphic context and, if we are lucky, including an illustration. It is far from certain if they are confined to certain types of functional contexts such as burials or ritual deposits in religious buildings, or whether they were a rare but purely utilitarian form. The Nilgiri bowls almost certainly come from megalithic graves,⁹⁰ and the splendid black granite bowl from near Taxila in Pakistan, which is now in the British Museum, was found

in 1861 in the center of a ruined masonry building between Shahr Dheri and Usman Khattar north of Taxila, by two zamindars while digging for treasure.⁹¹ Almost certainly this was a foundation deposit for a stupa.⁹² Whatever the function of the ceramic and metal vessels it is difficult to believe that this stone vessel would have been made for a secular or utilitarian purpose.⁹³

It is difficult to believe that these formal similarities arose quite independently in the two areas. Rather, I believe that they provide yet further evidence for the penetration of Indian material culture style into Southeast Asia. If we seek an explanation for the meaning of the base knob and concentric circles, then I think that this should be seen as a commonly understood mandala, a schematic cosmological symbol representing perhaps Mt. Meru and the surrounding oceans. These containers, whether of bronze, stone, or pottery did not serve as everyday cooking, serving, or food display vessels, but served some special purpose for ritual and funerary use only. They are witness to the adoption in Thailand, by some groups, of Indian moral, philosophical, and political concepts. The finds on which this argument is based can be dated with reasonable certainty to the last few centuries B.C. and reinforce the position of Ban Don Ta Phet as the earliest "Indianizing" site so far recognized in Thailand.

Textiles from Ban Don Ta Phet

A few textile fragments and threads were found adhering to bronzes at Ban Don Ta Phet and most of these for the joint London-FAD excavations have been examined by Chiraporn Aranyanak of the Conservation Laboratory of the National Museum, Bangkok, a specialist on ancient textile fibers. Although her work is far from complete she has told me that she has been able to identify hemp, the fiber derived from *Cannabis sativa* as the most common material used, and cotton, from a single thread adhering to a bone fragment (sf.604) from context 46. The identification of cotton, the earliest I believe yet identified in Thailand, strengthens the evidence for early links with India for this is where the cotton plant (*Gossypium sp.*) was originally domesticated in the context of the Harappan Civilization of the third millennium B.C.

Summary

The presence of various categories of material at Ban Don Ta Phet imported from India by the fourth century B.C., together with the other evidence for mutual exchange between northern and eastern India, Thailand, Malaysia, and Indonesia strongly suggests that Buddhist mission-

aries were already active, indeed were established, in Southeast Asia before the Christian Era and perhaps even before the reign of the Emperor Asoka. Wheeler was correct to argue a generation ago on the basis of the evidence that the few items at that time known to be derived from India or the Roman world came there through Èdrifti rather than through organized commercial relationships; but enough evidence is now at hand to refute this interpretation and to show that Southeast Asia was already part of a world trading system linking the civilizations of the Mediterranean Basin and Han China.

Thus, for one section of the southern Silk Road from China to the Near East and Europe, recent archaeological work has been able to show that the network of trade, which in later centuries transmitted silk, porcelains, and high quality manufactured goods from China to the West—and bullion, for the most part, from west to east—was already established at the very beginning of the Buddhist Era and before the coalescence of the Warring States of China into a single mighty empire. Whether silk itself was being shipped south from China at this time is not yet clear. We have had hints from sites in Thailand⁹⁴ that silk may have been known in Southeast Asia at this time, but the identifications are not yet sufficiently secure to be sure of this. Even if silk is found in well-dated prehistoric contexts in Southeast Asia, this does not necessarily mean that it was an import at that time from the north since silk cultivation itself may have been long established in the region; but only further archaeological research and laboratory examination will make this clear.

Notes

The fieldwork on which much of this article is based on what was done in co-operation with the Fine Arts Department of Thailand and I particularly want to thank the various Directors General and Mr. Pisit Charoenwongsa, formerly of the Division of Archaeology, for their very great help. The research was supported by the British Academy, the Hayter and Gordon Childe Funds of the University of London, the Evans Fund of Cambridge, the Society of Antiquaries of London, and the British Museum. I am especially grateful to the late Kalyan P. Gupta, Dr. Himanshu Ray, K.N. Dikshit, Rafiq Mughal, Surapol Natapintu, Robert Knox, and Elizabeth Errington for their help in tracking down various Indian parallels for the material from Ban Don Ta Phet, and calling my attention to new discoveries.

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2. J.C.H.S. Davidson, "Urban Genesis in Viet-Nam." In R.B. Smith and W. Watson, eds., *Early South-East Asia* (Oxford University Press, 1979), pp. 304-14; D.T. Bayard, "A Tentative Regional Phase Chronology for Northeast Thailand." *South-East Asian Archaeology*, at the 15th Pacific Science Congress, Otago University Studies in Prehistoric Anthropology 16 (1984): pp. 87-128. Moore, E.H., "Moated Sites in Early North East Thailand." *B.A.R. International*, Series 400 (1988): pp. 150-53.
3. Wheatley, "Nagara and Commandery," p. 264
4. H.P. Ray, "Early Maritime Contacts;" "In Search of Suvanabhumii: Early Sailing Networks in the Bay of Bengal." In: P. Bellwood, ed., *Indo-Pacific Prehistory, 1990*, vol. 1 (Canberra and Jakarta: Indo-Pacific Prehistory Association, 1991): pp. 557-65; and "Early Coastal Trade in the Bay of Bengal." In: J. Reade, ed., *The Indian Ocean in Antiquity* (London: Routledge, forthcoming).
5. Brookfield and D. Hart, *Melanesia: A Geographical Interpretation of an Island World* (London: Methuen, 1971), pp. 314-31. J. Miksic, *Archaeological Research on the 'Forbidden Hill' of Singapore: Excavations in Fort Canning, 1984* (Singapore: National Museum, 1985), pp. 1-35 presents a useful synthesis of the growth of external trade in the region around the Malay Peninsula from later prehistory to the nineteenth century A.D.
6. Ray, "In Search of Suvanabhumii."
7. I do not deal with the connections from Southeast Asia to China, only with those to the west, although it is worth noting here that recent surveys and casual discoveries in Thailand and Java have produced a surprisingly large number of Chinese, primarily Han-style artifacts, and we shall soon have to take this new data into account.
8. Ray, "Early Coastal Trade in the Bay of Bengal."
9. V. Begley, "Arikamedu Reconsidered." *American Journal of Archaeology* 87 (1983): pp. 461-81; and V. Begley and R.D. De Puma, eds., *Rome and India—the Ancient Sea Trade* (Madison, Wisc.: University of Wisconsin Press, 1991); and W. Wijaya-

- pala and M.E. Prickett, *Sri Lanka and the International Trade*. Catalogue for an Exhibition of ancient imported ceramics found in Sri Lanka's archaeological sites (Colombo, Department of Archaeology, 1986).
10. J.I. Miller, *The Spice Trade of the Roman Empire, 29 B.C.–A.D. 641* (Oxford University Press, 1969).
 11. I.H. Burkill, *The Economic Products of the Malay Peninsula*. (London: Crown Agents, 1935): pp. 976-80
 12. R.E. Eicholz, ed., *Pliny's Natural History*, Book 37, Loeb Classical Library Volume 8 (London: Heinemann, 1962).
 13. R.F. Ellen, "The Trade in Spices." *Journal of the Indonesian Circle* 12 (1977): p. 25
 14. G.W.B. Huntingford, ed., *The Periplus of the Erythraean Sea* (London: The Hakluyt Society, 1980): app. 4.
 15. Begley and De Puma, *Rome and India*; N. Seeley and P. Turner, "Metallurgical Investigations of Three Early Indian Coinages: Implications for Metal Trading and Dynastic Chronology." In: B. Allchin, ed., *South Asian Archaeology 1981* (London: Cambridge University Press, 1984); P. Turner, *Roman Coins in India*. Occasional Paper No. 12 (London: Institute of Archaeology, 1989); and R.E.M. Wheeler, *Rome Beyond the Imperial Frontiers* (Harmondsworth: Penguin, 1954).
 16. E.C.L. During Caspers, "The Indian Ivory Figurine from Pompeii—a Reconsideration of its Functional Use." In: H. Hartel, ed., *South Asian Archaeology, 1979* (Berlin: Dietrich Reimer Verlag, 1981): pp. 341-53.
 17. E.H. Warmington, *The Commerce Between the Roman Empire and India* (Cambridge University Press, 1928); J.I. Miller, *The Spice Trade of the Roman Empire, 29 B.C.–A.D. 641* (Oxford University Press, 1969); M.G. Raschke, "New Studies in Roman Commerce with the East," in *Aufstieg und Niedergang der Römischen Welt*, vol. 2, no. 9 (Berlin and New York: de Gruyter, 1978), pp. 604-1378; R.E.M. Wheeler, *Rome Beyond the Imperial Frontiers* (Harmondsworth: Penguin, 1954).
- I think that a good argument could be made for the introduction of iron into Southeast Asia from eastern or Peninsular India in the mid-first millennium B.C. However, I will not try to develop this further here since we have very few well-dated and described early Iron Age sites in Southeast Asia. Ban Don Ta Phet is almost certainly not one of the earliest sites with iron in Thailand—iron bracelets on well-stratified burials at Nil Kham Haeng are dated to about 700 B.C. (V.C. Pigott, *Recent Excavations at Nil Kham Haeng and the Archaeometallurgy of Copper Production in Central Thailand*. 3d International Conference of South-East Asian Archaeologists in Western Europe, Brussels [December 1990]), and there is at the moment a lack of comparability between the iron tools and weapons from Ban Don Ta Phet and Ongbah Cave (P. Srensen, "Prehistoric Iron Implements from Thailand." *Asian Perspectives*, vol. 16, no. 2 (1974): pp. 134-73)—the only two sites in Thailand yielding a large number of well-preserved iron artifacts—and those from southern and eastern India.
18. C. Renfrew, "Trade as Action at a Distance: Questions of Integration and Communication." In: J.A. Sabloff and C.C. Lamberg-Karlovsky, eds., *Ancient Civilization and Trade* (Albuquerque: University of New Mexico Press, 1975): pp. 3-60.
 19. Wheeler, *Rome Beyond the Imperial Frontiers*, pp. 206-7
 20. M.G. Raschke, "New Studies on Roman Commerce with the East." In: *Aufstieg und Niedergang der Römischen Welt*, vol. 2, no. 9 (Berlin and New York: de Gruyter, 1978): p. 653.
 21. In the original description of the lamp from Pong Tuk (Thailand), Coëdes (G. Coëdes, "The Excavations at P'ong Tuk and their Importance for the Early History of Siam." *Journal of the Siam Society* 21 [1928]: pp. 195-209) compared it to Roman

- lamps of the first century A.D. from Pompeii; Picard (Picard, C., "La Lampe Alexandrine de P'ong Tuk [Siam]." *Artibus Asiae* 18 [1955]: pp. 137-49) argued, on the basis of many examples, that it is a Ptolemaic lamp from an Alexandrine workshop of the late centuries B.C., but most recently Brown and Macdonnel (R.L. Brown, and A.M. MacDonnel, "The Pong Tuk Lamp: a Reconsideration." *Journal of the Siam Society* 77 (2) [1989]: pp. 9-20) have strongly suggested that it is late Roman or Byzantine from the eastern Mediterranean, dating to between the first to fifth/sixth centuries A.D. National Museum, Bangkok. For information on the Mediterranean seals, see L. Malleret, *L'Archéologie du Delta du Mekong*, 2-3 (Paris: Publications de l'École Française d'Extrême-Orient, 1960-1962).
22. H.C. Brookfield and D. Hart, *Melanesia: a Geographical Interpretation of an Island World*. (London: Methuen, 1971), pp. 314-31; Renfrew, "Trade as Action at a Distance;" and A. Sherratt, "Resources, Technology and Trade: an Essay in Early European Metallurgy." In: G. de G. Sieveking, et. al, eds., *Problems in Economic and Social Archaeology* (London: Duckworth, 1976), pp. 557-81.
 23. Bayard, "A Tentative Regional Phase Chronology for Northeast Thailand;" and C.F.W. Higham and A. Kijngam, "Prehistoric Investigations in Northeastern Thailand." *B.A.R. International Series* 231 (1984): pp. 13-21.
 24. P. Bellwood, *Prehistory of the Indo-Malaysian Archipelago* (Sydney: Academic Press, 1985), chap. 7
 25. I should make it clear early in this discussion that not all citations of "fact" and opinion concerning early Indian trade with the West can be fully referenced in this paper or it would come to resemble that invaluable and monumental compendium by Raschke, "New Studies in Roman Commerce with the East" with its 674 pages and 1791 endnotes.
 26. M. Hitchcock, "Research Report on Indonesian and Tanzanian Maritime Links." *Indonesia Circle* 59 & 60 (1993): pp. 62-67.
 27. I.C. Glover, "The Late Prehistoric Period in Indonesia." In: R.B. Smith and W. Watson, eds., *Early South-East Asia* (Oxford University Press, 1979), pp. 167-84; and B.A.V. Peacock, "The Later Prehistory of the Malay Peninsula." In: R.B. Smith and W. Watson, eds., *Early South-East Asia* (Oxford University Press, 1979), pp. 199-214.
 28. Renfrew, "Trade as Action at a Distance," pp. 41-42.
 29. A.N. Bennett, "The Contribution of Archaeometallurgical Studies to South-East Asian Archaeology." *World Archaeology* 20 (3), (1989): pp. 329-51; Higham and Kijngam, "Prehistoric Investigations in Northeastern Thailand," pp. 63-70; S. Natapintu, "Archaeological Evidence from Ban Tha Kae and Some Notes on Ancient Settlements in Lower Central Thailand." In: Bhuthorn Bhumathon, ed., *The Archaeological Site of Ban Tha Kae* (in Thai) (Bangkok: Fine Arts Department, 1984), pp. 1-12; V.C. Pigott, and S. Natapintu, "The Thailand archaeometallurgy project." *Muang Boran Journal*, 10 (4) (1984): pp. 126-27; and P. Pisnupong, "Aspects of Stone-Working at Khok Phanom Di" (M.A. thesis, Orago University, Department of Anthropology, 1988); M. Santoni, J.P. Pautreau, S. Prishanchit, "Excavations at Obluang, Province of Chiang Mai, Thailand," in I.C. and E.A. Glover, eds., *South-East Asian Archeology 1986* (Oxford, BAR S-561), pp. 37-54.
 30. C. Landes, "Pièce d'époque romaine trouvée à U-Thong, Thaïlande." *Journal of Silpakorn*, 26 (1) (1982): pp. 113-15.
 31. Most publications on Khlong Thom are in Thai and others are unpublished reports available only in Bangkok. At the time of writing, the most accessible publications are M. Veraprasert, "Khlong Thom: an Ancient Bead and Manufacturing Location and an Ancient Entrepot." In: *Seminar in Prehistory of South-East Asia* (Bangkok:

- SEAMEO Project in Archaeology and Fine Arts [SPAFI Final Report], 1987), pp. 323-31; and B. Bronson, "Glass and Beads at Khuan Lukpad, Southern Thailand." In: I. C. and E. A. Glover, eds., *South-East Asian Archaeology 1986* (Oxford: BAR S-561. 1990), pp. 213-30. The former refers to the more significant accounts written in Thai, except that of Srisvohat, A., "Ancient Beads in the Southern Part of Thailand." In: Phongphaiboon Suthiwongsa, ed., *Encyclopedia of Southern Culture*, 10 vols., in Thai (Songkhla Institute of Southern Studies, Sri Nakarainraraviton University, 1987): pp. 321-43, which contains by far the best illustrations.
32. Veraprasert, "Khlong Thom," p. 328; and B. Bronson, pers. com.
 33. Martin Henig of the Institute of Archaeology, Oxford, has seen the photograph of these seals and has kindly provided me with these identifications. The seal showing Tyche he compares with the following; nos. 102-5, p. 15 in M. Henig and M. Whiting, eds, "Engraved Gems from Gadara in Jordan. The Sa'd Collections of Intaglios and Cameos," no. 6 (Oxford University Committee for Archaeology Monograph, 1985) and to nos. 602-4 in G. Sena Chiesa, *Gemme del Museo Nazionale dei Aquileia* (Padua, 1966). The 'fighting cocks' seal he refers to Sena Chiesa (1966): no. 1341, p. 1341.
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 36. I. C. Glover, "Early Trade between India and South-East Asia—a Link in the Development of a World Trading System." *Occasional Paper No. 16* (Hull: University of Hull, Centre for South-East Asian Studies, 1990; 2d revised edition).
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 38. I. H. N. Evans, "Notes on the Remains of an Old Boat from Pontian, Pahang." *Journal of the Federated Malay States Museums* 12 (16) (1927): pp. 93-96; "On Ancient Remains from Kuala Selensing, Perak." *Journal of the Federated Malay States Museums* 12 (22) (1928): pp. 121-31; "Further Notes on Remains from Kuala Selensing, Perak." *Journal of the Federated Malay State Museums* 12 (25) (1928): pp. 79-134, "Excavations at Tanjong Rawa;" and Shuhaimi, "Recent Research at Kuala Selensing."
 39. Evans, "Notes on the Remains of an Old Boat;" and G. Sieveking, "The Iron Age Collections of Malaya." *Journal of the Malayan Branch of the Royal Asiatic Society*, 39 (2) (1956): pp. 93-94.
 40. Since there is no free charcoal in the site which we can associate with the burials, and thermoluminescence dating did not give consistent and reliable results, we had to look for a new source of datable material and this has been provided by the organic temper (mainly rice) in one of the pieces of pottery of what we call "Fabric A." The possibility of directly dating the pottery was first seen by Dr. Ian Freestone of the British Museum Research Laboratory while he was investigating the weathering of the quartz grains which gave the problems with TL dating, and one date (BM-2016) was produced in 1981 but later recalculated by the laboratory to 2190±230 BP (BM-2016R). But because of the small sample of carbon available and type of counter used by the BMRL, this result had the unacceptably large standard error of Å 230 and it was clear that only mass-spectrometry accelerator dating could give us good enough results with this sort of material. The Oxford Radiocarbon Accelerator Unit accepted four samples for dating in 1987.

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54. Spriggs and Miller, "A Previously Unreported Bronze Kettledrum," p. 86
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58. M. Stuiver and G.W. Pearson, "High Precision Calibration of the ^{14}C Time Scale, A.D. 1950–500 B.C." *Radiocarbon*, vol. 28, No. 2B (1986): pp. 805-38.
59. A comparative study of early Thai and Indian glass beads has been undertaken by Kishor Basa as part of his Ph.D. thesis in London (K.K. Basa, *The Westerly Trade of South-East Asia from c. 400 B.C. to c. A.D. 500 with Special Reference to Glass Beads*. (Ph.D. diss., London: Institute of Archaeology, UCL, 1991). I would like to acknowledge his help in the preparation of this article. See also K.K. Basa, et al., "The Relationship between Early South-East Asian and Indian glass." In: P. Bellwood, ed., *Indo-Pacific Prehistory 1990*, vol. 1 (Jakarta and Canberra: Indo-Pacific Prehistory Association, 1991): pp. 366-85; and I.C. Glover and J. Henderson, "Early Glass in South and South-East Asia and China." In: R. Scott and E. Moore, eds., *China and South-East Asia—Art, commerce and Interaction* (London: Percival David Foundation of Chinese Art, forthcoming) for a discussion of the comparative chemical compositions of early Indian and Southeast Asian glass.
60. Glass beads simulating natural emerald or beryl crystals seem to be rare in museum collections from the Mediterranean world. To date, we have only found two in the holdings of the Department of Greek and Roman Antiquities of the British Museum. One (BM 81-7-9-8) is 33.9 cm long by 23.3 cm in diameter and is made of a translucent watery green glass and appears to have been drilled for suspension, as a natural gemstone would be. Only the surface weathering and refractions from the hydration layers clearly showed that it was made of glass. It was accessed to the museum in 1881, and the catalogue entry, difficult to read, suggests that it comes from Amrit on the Syrian coast just south of Tarkis. The other piece (BM 87-7-6-25 from Tyre) is smaller, darker, more weathered but also is clearly made in the form of the hexagonal crystal of the beryl group, see W. Schumann, *Gemstones of the World* (London: N.A.G., 1977): pp. 90-96.
61. P. Francis, *Glass Beads of India* (Lake Placid, New York: Lapis Route Books, 1982).
62. H.C. Beck, "The Beads from Taxila, New Delhi." *Memoire of the Archaeological Survey of India*, no.65 (1941): Pl. IX, 3 and 12
63. K.K. Basa, pers. com
64. L. Malleret, *L'Archéologie du Delta du Mekong*, 2-3 (Paris: Publications de l'École Française d'Extrême-Orient, 1960-1962): p. 43.
65. A preliminary report on the composition of the glass from Ban Don Ta Phet and comparisons with Indian and other early Southeast Asian glass has been presented in Basa et al., "The Relationship between Early South-East Asian and Indian glass." Henderson and Glover are currently analyzing more glass from Arikamedu and have further unpublished composition analyses on glass from Ban Don Ta Phet and these will be presented in a future report.
66. During her examination of the drill holes in the agate and carnelian beads from Ban Don Ta Phet, Williams (L. Williams, "A New Approach to the Study of Bead-making Workshop Practices with Special Reference to Carnelian and Agate Beads from Ban Don Ta Phet, Thailand." [B.A. Report, University of London, Institute of Archaeology, 1984]) observed distinctive regular concentric grooves which she was unable to replicate using either metal or stone drill bits with abrasive sands. Leonard Gorelik has suggested that such marks, which he had observed on ancient beads from Mantai in Sri Lanka and Arikamedu in South India and on beads made by contemporary Cambay craftsmen, and which he had replicated in his own experiments, could only have been produced by the use of diamond-tipped drills. The case for this at Mantai and Arikamedu is set out in A.J. Gwinnett and L. Gorelik, "Evidence for the Use of a Diamond Drill for Bead-making in Sri Lanka, c. 700–1000 A.D." *Scanning Electron Microscopy* 11 (1986): pp. 473-77. In a telephone message

- in November 1990, Dr. Gorelik told me that he had identified the use of a diamond-tip drill to the eighth century B.C. on material from Yemen.
67. A. Lamb, "Some Observations on Stone and Glass Beads in early South-East Asia." *Journal of the Malayan Branch of the Royal Asiatic Society* 38 (1965): pp. 87-124.
 68. P. Bellwood, "Archaeological Research in Minahasa and the Talaud Islands, North-eastern Indonesia." *Asian Perspectives* XIX (22) (1978): pp. 240-88; and P. Francis, *Indian Agate Beads* (Lake Placid, New York: Lapis Route Books, 1982).
 69. Every time I visit Thailand I have been shown more etched beads in private collections and provincial museums, and a detailed study of the range of their forms and techniques of manufacture would be timely. My preliminary observations suggest that Thai etched beads are not simply a random sample of the range of South Asian beads, so either Indian beadmakers produced for and exported to a discriminating market, or there was a yet undiscovered eastern center of manufacturing etched beads. Many etched and other decorated beads have recently been identified in Myanmar although none from dated excavated context, see U. Aung Myint and E. Moore, "Beads from Myanmar (Burma): Line Decorated Beads amongst the Pyu and Chin." *Journal of the Siam Society* (forthcoming); and, of course, there is a separate tradition of Tibetan etched (*dzi*) beads, see J.D. Allen, "Tibetan Dzi beads." *Ornament* 6 (2) (1982): pp. 57, 60-1.
 70. Carnelians, which in the raw state are more often salmon pink than red, have usually been roasted to strengthen their color through oxidation, see G. Possehl, "Cambay Beadmaking." *Expedition*, vol. 23, no. 4 (1981): pp. 39-47; and Francis, *Indian Agate Beads*, p. 2, and the black agates may also have been darkened by boiling them in a sugar syrup followed by oxidation of the organic solution which readily penetrates the microscopic fibrous structure of the chalcedony group of quartz minerals. Most books on gemstones (e.g. M. Bauer, *Precious Stones*, translated by L.J. Spencer, from 1904 edition [New York: Dover, 1968], pp. 522-23, and Schumann, *Gemstones of the World*, p. 136) indicate that this technique, known for some time in Rome, was introduced from there to Idar-Oberstein in Germany about 1820. But examination of etched agates from Thailand and India shows that it was regularly practiced in antiquity. H.C. Beck, "Etched Carnelian Beads." *Antiquaries Journal* XII (1933): pp. 384-98; E. Mackay, "Decorated Carnelian Beads." *Man* (September, 1933): pp. 143-46; and M.G. Dikshit, *Etched Beads in India* (Deccan College Monograph Series 4).
 71. J. Reade, "Early Etched Beads and the Indus-Mesopotamia Trade." Occasional Paper, No. 2 (1979).
 72. Beck, "Etched Carnelian Beads," pp. 387-88 and pl. LXXI.
 73. R.C. Gaur, *Excavations at Atranjikhhera* (Aligarh Muslim University, Centre of Advanced Study, Department of History, 1983): fig. 4.
 74. Chin You-di, "Nothing is New." *Muang Boran Journal* 4 (4) (1978): pp. 6-16.
 75. At least two etched beads (one white on black agate and one white on red carnelian) were illustrated by Veraprasert in a presentation made to the Research Conference on Early Southeast Asia in Nakorn Pathom in April 1985, but they are not included in the versions of this talk (Veraprasert, "Khlong Thom;" and "Khlong Thom: an Ancient Bead and Manufacturing Location and an Ancient Entrpot." In: I.C. Glover et al., eds., *Early Metallurgy, Trade and Urban Centres in Thailand and South-East Asia* [Bangkok: White Lotus, 1992]: pp. 149-61). They are probably among those illustrated in Srisvohat (1987). An unpublished etched agate from Ban Chiang was seen in the site museum there in January 1985. It is a spherical black agate bead, 2 cm. in diameter with three 'latitudinal' white bands, a type common at Don Phet (see, for instance, Glover et al., "The Cemetery of Ban Don Ta Phet," fig. 46,

- no. 73). This Ban Chiang bead is catalogued as 189/2515 (1972) p. 437, and was donated to the museum by Prakru Vimolpamyakorn, the Abbot of Wat Bothi Sri Narai at Ban Chiang, and is said to have been found in the excavations in the monastery compound. It is almost certainly from the Late Period at Ban Chiang which White (J. White, "A Revision of the Chronology of Ban Chiang and its Implications for the Prehistory of Northeast Thailand" [Ph.D. diss., University of Pennsylvania, 1986], p. 279) now dates to 300 B.C.–A.D. 300, and should be nearly enough contemporary with the occurrence of this type at Ban Don Ta Phet. In Southeast Asia and outside Thailand and Myanmar, etched beads are even rarer. Evans ("On Ancient Remains from Kuala Selinsing," p. 123; and "Further Notes of Remains from Selinsing," p. 139) reports what seem to be several etched agate and carnelian beads from the ancient settlement at Tanjong Rawa, Kalumpang Island, Kuala Selinsing, Malaya; a few have been found on the island of Palawan in the Philippines (R. B. Fox, *The Tabon Caves* [Manila: Monograph No. 1 of the National Museum, 1970]: col. Pl.1a); three were excavated at Leang Buidane Cave in the Talaud Islands of north-central Indonesia (Bellwood, "Archaeological Research in Minahasa and the Talaud Islands, pp. 275-76 and fig.10); one has been published from the excavations at the early city of Beikthano in Central Myanmar (Aung Thaw, *Report on the Excavations at Beikthano*, fig.76) and many more surface finds from Myanmar have been documented by Aung Myint and Moore, "Beads from Myanmar." One cylindrical etched carnelian was found in Tomb 13 at Shizhaishan (Zuo Ming, "Etched Carnelian Beads Found in China." *Kaogu* 1974 6 [1974]: pp. 382-85) and another was found in Tomb 24 at Lijiashan (Zhang Zhenqi, "An Analysis of the Bronze Culture in the Area of Dian Chi Lake, Yunnan Province." *Southern Ethnology and Archaeology* 1 [1987]: p. 110), both in Yunnan Province, South China. These examples are rather securely dated to the Western Han period (175-118 B.C.) and are very similar to two of the beads from burial context 73 at Ban Don Ta Phet (Glover et al., "The Cemetery of Ban Don Ta Phet," fig. 46), and to many in northern India (see Jamal Hassan, "The Distribution and Type of Beads in the Gangeatic Valley." *Puratattva* 11 [for 1979-80] [1982]: p. 133).
76. J. Marshall, *Taxila: an Illustrated Account of the Archaeological Excavations*, vol. III (Cambridge University Press, 1951): pl. 496
77. A.K. Coomaraswamy, *Introduction to Indian Art*, 2d edition (Delhi: Munshiram Manoharlal, 1966), pp. 30-1
78. These "bicephalous" pendants are usually called jade in the literature but, to my knowledge, no previous finds have so far been mineralogically identified. In 1985 we were fortunate in having one small broken fragment from the handle of the pendant from Ban Don Ta Phet, and this was identified as actinolite by Dr. D.R.C. Kempe of the Department of Mineralogy of the British Museum (Natural History). Actinolite is an amphibole and includes nephrite, one of the two jade minerals, and Dr. Kempe comments that "it is safe to call this jade" (pers. com. 14.3.1985). As mentioned in the text these pendants are a diagnostic artifact of the Sa-Huynh Iron Age Culture of Central Vietnam; at least one has been found in context at Xuan An, a Dongson Culture site in the southern part of the Red River Valley (Chua Van Tan, "Nouvelles recherches préhistoriques et protohistoriques au Vietnam." *Bulletin de l'École Française d'Extrême-Orient* 68 [1980]: pp. 113-54; and Ha Van Tan and Trinh Duong, "Khuyen tai hai thu va quan he Dongson – Sa Huynh" [Two-headed animal earrings and the relationship between Dongson and Sa Huynh]. *Khao Co Hoc* 4 [1977]: pp. 62-67). I was told in January 1987 that eighty to one hundred such animal pendants have now been found in that country where they are dated from the last few centuries B.C. to the second century A.D. One glass pendant of

- this type was found in a site in the Tubon Valley and is now in the Danang Provincial Museum. Apart from the two specimens from Thailand, two have been found in the Philippines where they are included in the ethnic category of the *ling-ling-o* ornament (W.G. Solheim, "Remarks on the Lingling-O and Bi-cephalous Ornaments." *Journal of the Hong Kong Archaeological Society* 10 [1982-1983]: pp. 107-11; R.B. Fox, *The Tabon Caves* [Manila: Monograph No. 1 of the National Museum, 1970], fig.37a and pp. 126-31), and one was recorded in the 1930s as a cult object of the Yami people of the island of Botel Tobago (Orchid Island) off the southeastern coast of Taiwan (T. Kano, "Kotosho Yami no yagi suhai ni tsuite" [About Goat Worship of the Yami of Botel Tobago]. *Jinruigakuzasshi* 45 [in Japanese] [1930]: pp. 41-45).
79. Chin You-di, "Nothing is New," fig. 2a and p. 12
 80. Chua Van Tan, "Sahuynh, a Civilization Type of the Metal Age in Vietnam." In: *Recent Discoveries and New Views on some Archaeological Problems in Vietnam* (Hanoi: Institute of Archaeology, Committee of Social Sciences, 1979): pp. 30-1
 81. W. Rajpitak and N. Seeley, "The Bronze Bowls from Ban Don Ta Phet: an Enigma of Prehistoric Metallurgy." *World Archaeology*, 11 (1) (1979): pp. 26-31.
 82. This vessel (Glover, 1989, fig. 25) is so far unique to Thailand and most closely resembles some objects in bronze and pottery from the contemporary Dongson Culture of North Vietnam, whence I believe it was imported.
 83. Rajpitak and Seeley, "The Bronze Bowls from Ban Don Ta Phet," pp. 27-30; and W. Rajpitak, "The Development of Copper Alloy Metallurgy in Thailand in the Pre-Buddhist Period, with Special Reference to High-tin Bronze" (Ph.D. diss., Institute of Archaeology, London, 1983).
 84. A. Rea, *Catalogue of Prehistoric Antiquities from Adichanallur and Perumbair* (Madras Government Museum, 1915); J.W. Brecks, *An Account of the Primitive Tribes and Monuments of the Nilgiris* (London: William H. Allan, 1873); and Marshall, "Taxila."
 85. A.N. Bennett and I.C. Glover, "Decorated High-tin Bronzes from Thailand's Prehistory." In: I.C. Glover, ed., *South-East Asian Archaeology 1990*, (Hull University, Centre for South-East Asian Studies, 1992): table 2.
 86. Bennett and Glover, "Decorated High-tin Bronzes," and K. Lualamai, "2000 Years Old Bronze Bowls from Ratburi," *Khan Chong* (in Thai) (Bangkok: Silpakorn University, 1986).
 87. B.C. Batchelor, "Post 'Hoabinhian' Coastal Settlement Indicated by Finds in Stan-niferous Langat River Alluvium near Dengkil, Selangor, Penninsula Malaya." *Federation Museums Journal* (n.s.) 2 (1978): pp. 1-55.
 88. There is some variability in the size and specific form of the bronze knobbed-base vessels at Ban Don Ta Phet. Generally they have steep, almost vertical sides curving to a flat base, with some thickening in the center of the base and at the rim. The walls are exceptionally thin, less than 0.5 mm. in some cases, and the vessels appear to have been turned or ground on a rotary device. The number and design of concentric circles varies also, but seven circles are commonly found, sometimes with a "dot and circle" motif between the larger rings. A detailed study of the variability and manufacturing methods employed on these vessels has been started and will be included in a final report on the site.
 89. J. Marshall, *A Guide to Taxila*, 3d. reprint edition (Karachi, Department of Archaeology, 1960), pl. VII; and B.B. Lal, "Sisulpalgargh 1948, an Early Historical Fort in Eastern India." *Ancient India* 5 (1948): p. 89 and pl. XLIV B
 90. R. Knox, "Jewellery from the Nilgiri hills: a Model of Diversity." In: J. Schotsmans and M. Taddei, eds., *South Asian Archaeology* (Naples: Instituto Universitario Orientale, 1985): p. 525

91. E. Errington, "The Western Discovery of the Art of Gandhara and the Finds of Jamalastu" (Ph.D. diss., London: School of Oriental and African Studies, 1987); and R. Mitra, "On Some Bactro-Buddhist relics from Rawal Pindi." *Journal of the Asiatic Society of Bengal* 31 (1862): pp. 175-79.
92. This circular black granite vessel (BM 1867, 4-27,1) was found in 1861 together with a crystal hamsa or goose (BM 1867, 4-27,2) which was said to be resting on the center cone of the bowl, and an inscribed piece of gold leaf, some 3 inches long known as the "Taxila scroll." The first two pieces were given by Cunningham to the British Museum in 1867 but the scroll was declared lost although not before a transcription was made and later published. It reads "(Gift) of Sira, depositing a relic of the Lord in the hamsa of her mother, the hamsa of her father. Might it become its place when a corporeal birth comes" (Errington, *The Western Discovery of the Art of Gandhara*, pp. 177-78). The British Museum attributes these pieces to Cunningham's Tope 32 of the Gangu group (Taxila), but Errington (*ibid.*) argues that they more probably came from another site, perhaps the Taxila Stupa 41, further west between Shahr Dheri and Usman Khattar. But whatever the specific location, there seems to be no doubt that the granite bowl was a Buddhist reliquary or ritual vessel of some type from the ruins of a religious building.
93. Sri K.N. Dikshit of the Archaeological Survey of India, in a letter dated 22.1.85, suggested that the pottery knobbed-base bowls may have been "used by Buddhist monks as a special type of bowl from the sixth century B.C. to the beginning of the Christian Era."
94. Higham and Kijngam, "Prehistoric Investigations in Northeastern Thailand," pp. 126-27.