

## "Traits" or "Treats"? Units of Archaeological Study: The Example of Maritime-adapted Cultures in Southeast Asia

Richard A. Engelhardt & Pamela R. Rogers

### I. The Maritime Ecniche

The Southeast Asian coastal environment is characterized by long stretches of sandy beach broken by estuarine areas of mangrove-covered mudflat. The coastline is punctuated by rocky outcrops and numerous off-shore island groups. The sea is shallow over the continental shelf with warm temperatures and low salinity. This landscape, which resulted from the flooding of the Sunda Shelf in Pleistocene times, is notable for having the world's longest total amount of coastline relative to land surface area.

This maritime environment provides many, small, scattered and biologically-interchangeable habitats each with a series of interlocking ecological zones: deep-sea through reef; mudflat and tidal wash to raised beach; mangrove and lagoon to hillslope (Fig. 1). The variety of ecniches plus climatic stability afforded by the high sea to land ratio supports a rich and stable biomass which has attracted human populations since Pleistocene times.

There are a wide range of marine resources available in such an environment: from seaweeds (*Rhizophyta*); to sea slugs (*holothuria spp*) and sea cildas (*Hippa asiatica*) living in the intertidal flats; to tree-climbing crabs (*Sesanna meinerti*) inhabiting the mangrove swamps; to the rock-dwelling oyster (*Ostreida crassostrea*) and mussels (*Mytilus viridis*); to the many

beach-burrowing sand clams (*Veneridae*); to the crabs (*Portunidae*), lobsters (*Paniluridae*), shrimps (*Penaeidae*) and squids (*Loliginidae and Sepiidae*) of the reefs; to large deep-water fish species, such as snappers (*Lutjanidae*) and sea bass (*Serranidae*) and other large sea animals including the green turtle (*Chelonia mydas*). All have been extensively exploited by the maritime-adapted sea people of Southeast Asia, as documented by both the ethnographic and archaeological data throughout the area. [Engelhardt and Rogers 1993 and 1994; Spoehr 1973.]

### II. A Subsistence Strategy Based on Shellfish

Some of the larger molluscan species, notably oysters (*Ostreidae*) and, to a lesser extent mussels (*Mytilidae*), occur in large concentrations throughout the region and are available year-round, permitting large-scale and intensive predation at regular and frequent intervals. Such species form not only energy-rich and reliable economic staples, but are the base-line of the subsistence strategy of maritime-adapted hunter-gatherers. Assured access to such species of shellfish is the most vital aspect of this strategy. Even during times of the year or under adverse circumstances when fishing is impossible, shellfish collecting continues to be an activity in which any and every member of the community can successfully participate.

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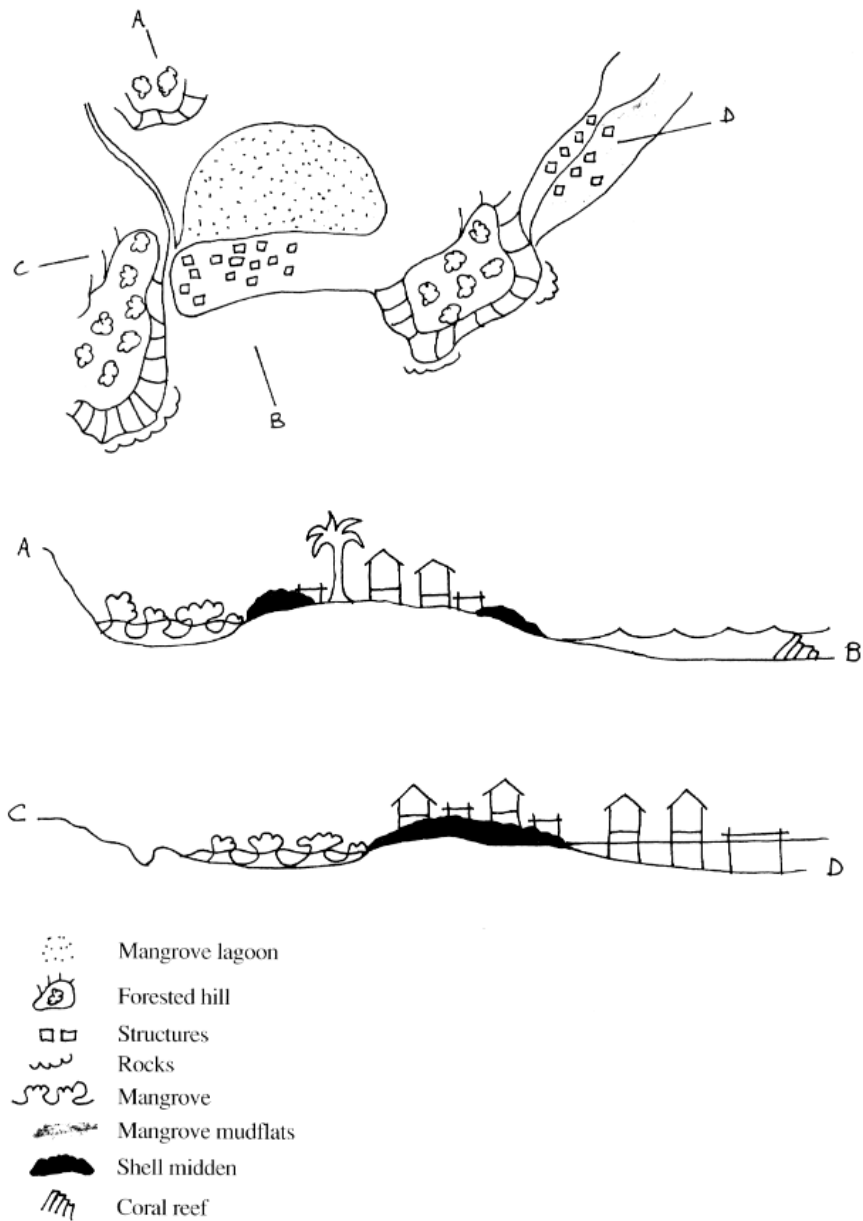


Fig. 1 Schematic drawing of the coastal eco-niche inhabited by maritime hunter-gatherers of Southeast Asia.  
 東南亞沿海採獵居民的小生態環境

All other subsistence activities are in a sense “optional” in contrast to the need to ensure a fail-safe supply of this dietary staple.<sup>(1)</sup> (Fig. 2)

When viewed from the archaeological perspective, the accumulation and patterning of the remains of these extensively-available and intensively-predated shellfish species is the definitive characteristic of sites occupied by maritime-adapted peoples of Southeast Asia. The accumulated remains of these staple shellfish species can therefore be termed “*traits*” of such archaeological sites. (Fig. 3)

There are, however, numerous other molluscan species<sup>(2)</sup> distributed differently in the environment, irregularly spaced in small colonies with season fluctuations in population. These species can be exploited

only in limited quantities and at intervals which are difficult to predict with certainty. These species, therefore, cannot unfailingly be relied upon to form any essential part of the subsistence base. In resource terms, they are primarily windfalls, collected opportunistically. Often their collection is labour intensive and may even involve risk, especially for the more vulnerable members of the group such as children, pregnant women or the elderly. In the terms of the science of energetics, the energy required to collect these mollusks typically exceeds the energy gained from their consumption. These relatively rare and less accessible shellfish species become valued for their luxury value rather than for their essential contribution to subsistence. They can be therefore be termed “*treats*,” when viewed in the archaeological record.



Fig. 2 Maritime hunter-gatherers collecting oysters. (Andaman Sea, west coast of south Thailand.)  
泰國南部的採贛作業



Fig. 3 A typical temporary habitation site of maritime hunter-gatherers showing the large accumulation of shellfish (oyster) remains in secondary deposition. (Tukay, Phuket, west coast of south Thailand.)  
泰國南部採獵居民的臨時村落，螺殼堆成小丘

Elsewhere [Engelhardt 1989; Engelhardt and Rogers 1993, 1994], we have reported on our ethnoarchaeological study of the role played by shellfish in the economic life and resulting archaeological deposits of maritime-adapted peoples living along the coast of southwest Thailand and on the offshore islands in the Andaman Sea.<sup>(3)</sup> During these studies we observed that the two ethno-categories of shellfish resources which we have termed, “*traits* and *treats*,” are collected, processed, consumed and discarded in distinctly different, yet regular ways. This different handling of the two categories of shellfish results in a distinctive archaeological patterning of their respective remains over the surface area of a site and stratigraphically within the site’s matrix. The two patterns of archaeological deposition so distinguished thus can be read

as markers: one of the economic condition of a group’s **subsistence strategy**; the other of the **social relations** associated with the group’s productive and consumption behaviour.

Archaeological evidence for the use of a particular coastal site and its component elements at any given time can be obtained by analysing the retrievable shell remains as either *traits* or *treats*. From the distribution of shell remains of various types within a site and from noting the additions to and alterations made to shell-processing areas it is also possible to map spatial relationships between structures and activity areas and thus to interpret the group’s social relations of production. The interplay of these variables models and explicates the economic and social strategy that maritime-adapted peoples evolve in order to adapt to

their environment and facilitate the extraction of subsistence from it.

### III. Processing and Discard Patterns Of *Trait* Shellfish

Staple mollusks are collected and brought back to a habitation or to a camp site in bulk quantities. At a site they are initially bulk processed by groups of people and in locations specifically set aside for this (and other communal, group) purpose. At some later time, the shellfish may be further prepared and will be consumed away from the initial processing location. The initial processing activity typically takes place at communal multipurpose activity areas in open spaces between and associated with residential units such as a group of houses, temporary camp shelters or boats drawn up on beaches. (Fig. 4)

Because these communal, multi-purpose activity areas are regularly swept and cleaned, the *in situ* depositional impact from the bulk processing of staple *trait* shellfish which is visible in the archaeological record is minimal. Tools and other materials associated with the process are removed from the area for storage and future use. Repeated processing does, however, add cumulatively to the compaction of the activity area which, upon excavation, renders it distinguishable from the surrounding spaces. Tiny fragments of shell enter the surface of the activity area, pressed in by traffic, the act of sweeping and dousing with the water and slop associated with shellfish processing. However, no other specific evidence of the processing of *trait* shellfish remains reliably visible *in situ*.



Fig. 4 On-site processing of oysters, a staple *trait* shellfish of maritime-adapted peoples in Southeast Asia. (Tukay, Phuket, west coast of south Thailand.)  
泰國南部濱海居民的主要貝類食物

Although the *in situ* identification of the remains of *trait* shellfish processing is problematic, remains of *trait* shellfish make up the principal component of the **secondary depositions** of sites of maritime-adapted peoples in Southeast Asia. The processing of *trait* shells is a virtually continuous, year-round activity, with an inevitable by-product of substantial quantities of shell. This volume of non-degradable waste quickly accumulates to unacceptably levels overwhelming the spatial capacity of a site, if not curtailed. Therefore, the shell waste is continually collected and re-deposited in secondary middens.

The pattern of secondary deposits of the remains of *trait* shellfish frames and in archaeological terms, defines the spatial limits of a maritime-adapted community. At any one site, the space available for both productive and social activities becomes, over time, increasingly constricted by accumulating shell refuse. Eventually the carrying capacity of a site is reached and the group must abandon the site, splintering and moving on to one or more of the many other similar and available econiches within their catchment area. Therefore, from the position of secondary depositions we can reconstruct the limits of a site and the degree to which the site has reached its carrying capacity. [Engelhardt and Rumball 1994]

#### IV. Processing and Discard of *Treat* Shellfish

The archaeological patterning created by the processing and deposition of *trait* shellfish reflects subsistence economic activity in relationship to the carrying capacity of a site. The processing of *treat* mollusks, by contrast, is primarily a **social** activity and is characterized by a different

pattern of deposition from which can be the social context in which the *treat* shellfish remains were deposited. *Treat* shellfish are collected in small quantities, typically by one or a few individuals (rather than as a group activity) and are then processed and consumed in a single event. Although collection of *treat* shellfish is an individual action, their consumption is typically a shared activity performed in areas equated with social intercourse: entrances or sitting platforms of houses, communal sitting platforms and public thoroughfares such as open communal activity areas and paths.

Comparison of deposition distribution maps made during our ethnoarchaeological investigations shows that other occasional objects in the ethnographic record follow the same deposition pattern as *treat* shells: fruit peels and pits; banana leaf food wrappers; plastic food bags and wrappers; betel condiments; cigarette and matches; and such other "social consumables" as cards and gaming pieces. In all these cases, *treat* remains are deposited *in situ* as **primary depositions** where consumed or in mid-stroll along paths and other communication axes of the site. Because *treat* remains tend to be small, few in number and sift into the sand matrix readily, these remains, in contrast to the remains of *trait* shellfish processing, are not systematically swept up and redeposited in secondary depositions. (Fig. 5)

#### V. Archaeological Patterns of Shellfish Remains

The secondary depositions in which *trait* shellfish end up, form regular patterns on sites occupied by maritime-adapted peoples. These middens consist primarily of many representatives of only one (or a very limited number of) species of shellfish, and

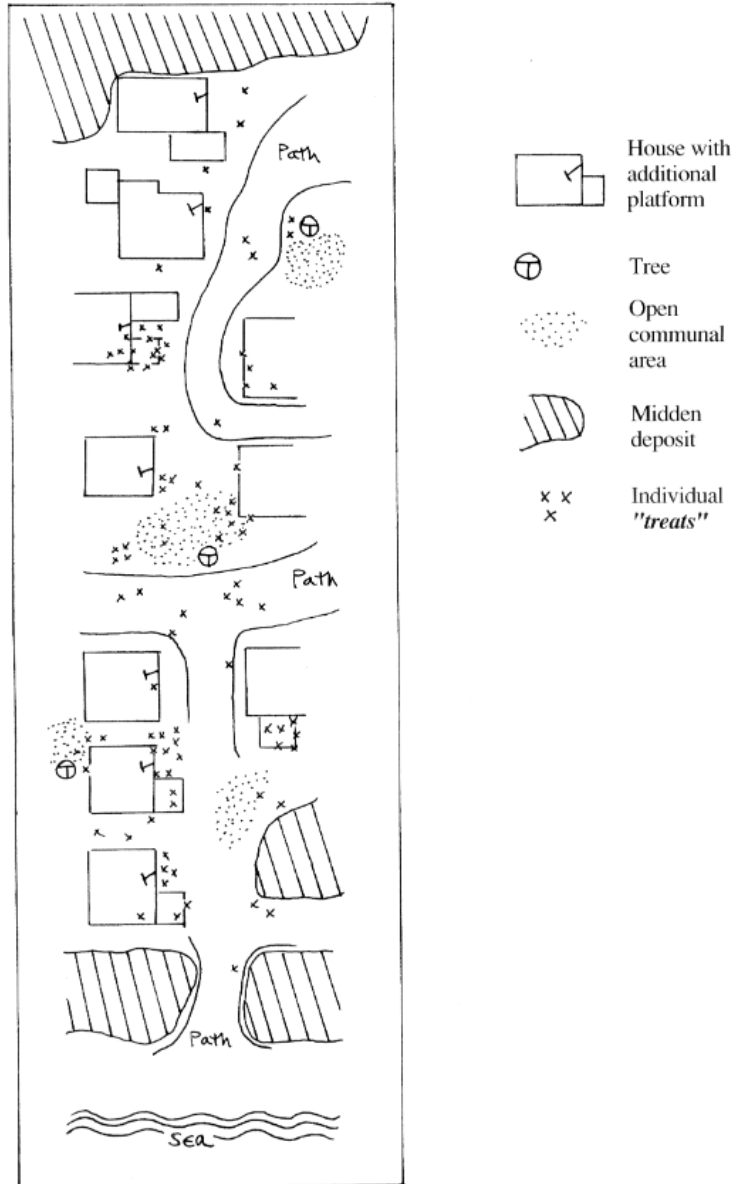


Fig. 5 Distribution of *treat* debris in a sample transect recorded at Tukay, Phuket.  
 泰國布吉島Tukay罕有貝類食物遺存分佈圖

may be mixed with other debris, both organic and inorganic, the random distribution and fragmentary character of which is indicative of secondary deposition.

Secondary depositions of *trait* shellfish occur along the **periphery of a site**, specifically: at the tide line along the front of the beach; at the lagoon edge along the back of a site; at scrub areas along the edges of the site; and around trees and other otherwise occupied and/or unusable space within a site. These secondary depositions define the limits of the activity area which is congruent with the site as a whole. Unless there has been post-depositional alternation of a site, the segregation and extent of secondary deposits are indicative of the extent to which the carrying capacity of a site has been reached and its surface area "filled up" with debris. (Fig.6)

As the surface areas of a site is gradually filled up with secondary deposits of *trait* shells, these shell mounds themselves serve as activity areas for the processing of yet more *trait* mollusks. In the process, the shells are redistributed within the mound and the mound flattened to create a work surface. This phenomenon takes place first near the centre of the communal sub-units of a site, gradually spreading and intruding on open communal activity near and under residential units. If mounds are associated spatially with postholes, it may well be that the posts represent a groups of houses, backing on each other with the mound growing in the space created. (Fig. 7)

From the pattern of *trait* shellfish middens it is possible to read the **macro-communal** structure of a maritime hunter-gatherers.<sup>(4)</sup> These secondary depositions



Fig. 6 Secondary deposition of *trait* shellfish filling the entire surface area at Sapam, a village of maritime hunter-gatherers in the Sea of Phuket, which has reached the limits of its carrying capacity.  
泰國布吉島Sapam主要貝類食物遺存，貝殼堆積如山





Fig. 7 A secondary deposition of *trait* shellfish being used as a processing activity areas and intruding on communal space between residential units, Tukay, Phuket.  
泰國布吉島Tukay居民在主食貝類堆積上作業

“frame” the site as a whole and within the site define its functional sub-units. These sub-units are building blocks consisting of communal multi-purpose activity/processing areas in the centre of a group of residential structures which in turn back on secondary deposition. Beyond the secondary depositions are peripheral areas where unsocial activity such as butchering and burial take place. (Fig. 8)

The broad picture read from the secondary *trait* deposition is complemented by the picture read from the *treat* depositions.

*Treat* depositions are small, discrete and homogeneous. They appear archaeologically isolated within the matrix of the site.

Juxtapositions of discarded *treat* shells, variations in surface compaction, post-holes and other variables in the archaeological record provides details at the individual rather than group level. This is the patterning of a site at the **micro-individual** level. For example, *treats* scattered over compacted surfaces typically represent multipurpose areas of general communal use. If such compacted surfaces are elongated and narrow with the *treat* debris concentrated towards the long edges of the surface, this can be read as a path or thoroughfares along which the *treat* debris has been dropped in transit. When *treat* debris is associated with an arrangement of postholes with compaction outside and loose sand inside, this is evidence of a communal sitting platform in an open area of the site. If a complex arrangement and/or a variety of *treat* debris is found, together

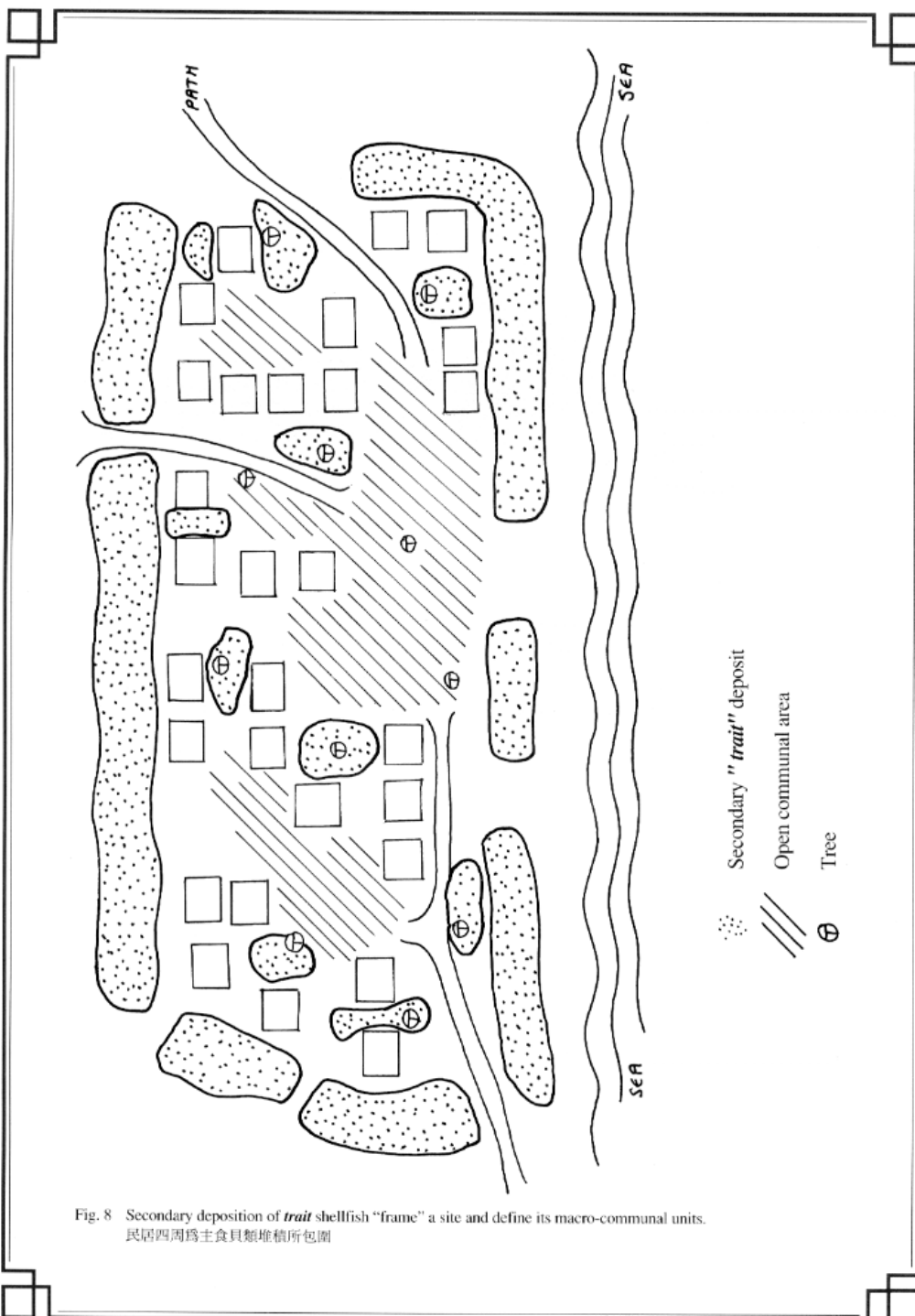


Fig. 8 Secondary deposition of *trait* shellfish "frame" a site and define its macro-communal units.  
 民居四周為主食貝類堆積所包圍

with postholes, variations in sand compaction and colour this is evidence of the remains of a residential structure. It is even possible to refine this picture to the details of doors, windows and kitchens for individual houses. (Refer again to Fig. 5). What all of these areas have in common is that they are areas in which individuals consume “*treats*” while socializing.

Thus while in the distribution of *traits* we can see the history of the “group”, in the distribution of *treats* we can trace the “individual” in time and space. (Fig. 9)

By mapping the interrelationship of the two types of shellfish deposition, information about the inter-relationship of economic activities and social structure of a site can be acquired. Different stages of a site’s development and or kinds of sites can also be read from the relationship of the two types of *treats* and *traits*. On an year-round or rainy season residential site there will be a well-defined frame of *trait* secondary deposition with primary depositions of *treats* inside this frame and distributed in such a way as to define paths, communal activity areas, residential units and other spaces of social intercourse. The remains of *trait* shellfish will predominate, with the remains of *treat* shellfish representing a widely scattered but numerically relatively small proportion of the total shellfish remains.

On a temporary seasonal campsite, secondary depositions of *trait* shellfish remain will be less common and may even be absent altogether, if the period of occupation was so short that no initial processing of subsistence *trait* shellfish was carried out on site. On such a site, the remains of *treat* shellfish will be proportionally larger and may comprise the

bulk of the shellfish remains to be found.

The mobile and flexible occupation patterns which characterize maritime hunter-gatherer’s use of sites throughout Southeast Asia is in this way reflected in the deposition of *trait* and *treat* shellfish remains.<sup>(5)</sup> At campsites occupied for short-term fish exploitation and therefore no substantial build-up of *trait* deposition. *Treat* deposition without *trait* deposition therefore indicates a temporary campsite, the seasonal use of which may be discerned from the *treat* shellfish remains. Longer-term residence is indicated by the presence of *trait* shellfish deposits which grow to cover the entire surface area of a site before the site’s carrying capacity is reached and the site abandoned for an alternative location.

These are only a few examples of how the deposition in the archaeological record of the remains of *trait* and *treat* shellfish can be used to reconstruct the seasonal use, age, and function of the many coastal sites throughout Southeast Asia which have been occupied by maritime hunter-gatherers over the past several thousand millennia.<sup>(6)</sup> On many such sites, shellfish remains may be main evidence for human use of the site (in conjunction, perhaps, with compacted surfaces and the occasional utilized stone). However, even with this limited evidence it is possible to reconstruct the spatial arrangement of a site under study, to fit it into a regional network of sites and to analyse the economic condition of the people who occupied the site. From their discarded shell remains we can begin to understand the socio-economic strategy which the maritime hunter-gatherers of Southeast Asia have evolved to best adapt to their unique environment created by the rising seas at the end of the last Ice Age.

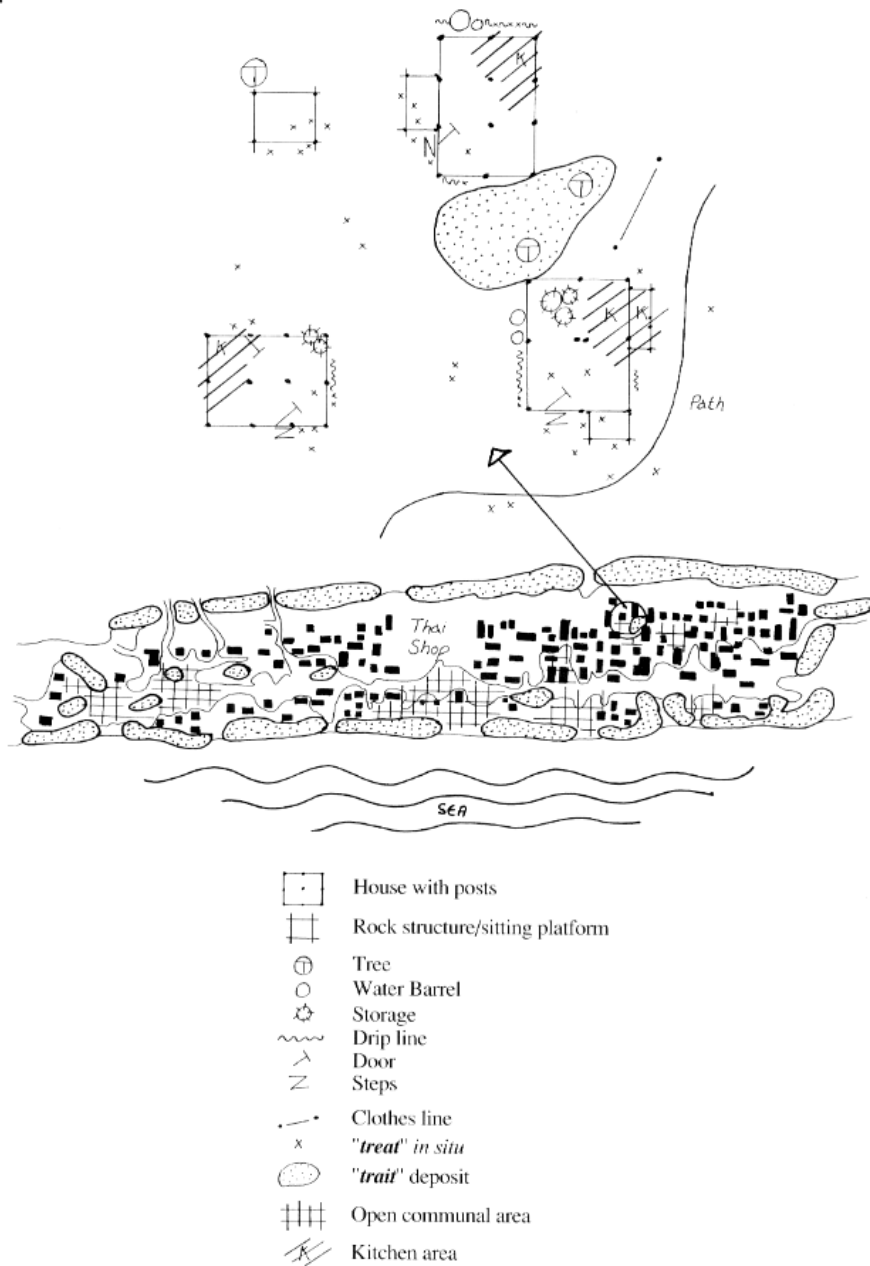


Fig. 9 Plan and inset of Tukay village, Phuket, Thailand showing the differential distribution of *treat* and *trait* remains.  
 泰國布吉島Tukay的主食貝類及罕有貝類堆積分佈圖

### Notes

- (1) Deep-sea fishing from boats — the subsistence activity which preoccupies the majority of young and robust members of the maritime-adapted hunter gatherers which we have studied — can provide a substantial infusion of protein into the group's diet. Nonetheless, because fishing has an unpredictable outcome and cannot always be engaged in because of weather and/or other random factors, it is sublimated to more predictable and reliable shellfish collecting.
- (2) For example: sand snails (*Natica maculosa*); limpets (*Cellana nigrolineata*); wheel shells (*Umbonium vestiarium*); cockles (*Arca granosa*); sand clams (*Veneridai*); razor clams (*Solen grandis*); fan shells (*Pinna pectinata*); and shipworms (*Teredo siamensis*).
- (3) The authors were co-principal investigators of "The Phuket Project", an archaeological, ethnological and biogeographical research project conducted on a series of 15 sites on islands off the west coast of south Thailand over a 3-year period in the early 1980's, followed by periodic return visits to update subsistence data and reconfirm material culture patterns, at intervals over the past 10 years.
- (4) Although the term "maritime hunter-gatherer" is here used because it is commonly understood, the preceding discussion should make it clear that the term "strand-looper" would perhaps be a more accurate characterization of the principal economic activity defining the adaptive mode of maritime-adapted coastal dwellers of Southeast Asia.

- (5) Elsewhere [Engelhardt and Rogers 1994] we have referred to this as "kaleidoscope" pattern of use and occupation of coastal sites.
- (6) The authors have dealt with other variable in the archaeological records of such sites elsewhere. See, for example, Engelhardt and Rogers 1993 for a discussion of the archaeological recovery and interpretation of activity areas and compacted surfaces; and see Engelhardt and Rogers 1994 for a discussion of environmental reconstruction and the calculation of the carrying capacity of sites from the analysis of secondary deposition.

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## 從不同性質的貝類遺存 看東南亞地區的濱海文化

Richard A. Engelhardt 及 羅美娜

### 【摘要】

東南亞沿海島嶼林立，海岸線曲折連綿；無數的港灣、淺灘、礁石和紅樹叢密佈的河口泥灘為海洋生物提供了絕佳的小生態環境。早在更生世時代，已有不少以採集及捕獵為生的先民被豐富的海洋資源吸引到此停居，發展出一系列適應海洋環境的技能。東南亞沿海的貝丘遺址，就是他們生活的遺蹟。本文探討如何運用貝類遺存的考古數據，重現這濱海文化的面貌。

遺址中發現大量軟體貝類遺存如螺等，多是較易採集或捕捉的品種，代表濱海居民的主要食糧。這些遺存的堆積和分佈能反映出吃前加工與吃後棄置的一些情況。由於貝殼碎屑堆積到一定程度，便會移到聚居地外圍傾倒；日

積月累；往往把活動中心重重圍住，待活動空間所餘無幾，便是時候另覓居地。因此，這些代表主食的貝類遺存不但能顯示遺址的範圍，更能反映出居民的經濟實況。

除了作為主食的貝類外，濱海居民還間中採集或捕得一些較罕有的品種，為個別居民日常食用添些新意，或作款客、舉行集體活動或慶典時全體享用。這些貝類遺存的分佈情況異於前者，顯示濱海居民除了集體交誼活動外，還有個體的社交往來。

透過兩種不同性質的貝類遺存，我們可瞭解到東南亞濱海地區先民的經濟型態，和社交情況。