CHAPTER II

The emergence of institutions during the formative period: social and economic

The archaeological evidence together with the ecological background described in the previous chapter, gives us a relatively clear idea about the pattern of community movement, the initial area of settlement and the chronological sequence during the Proto Historic period in the Primary Region. As a corollary to the above, the present chapter and the following one will attempt to outline the structure of the early institutions i.e. social, economic and political, during the formative period.

It is commonly believed that no sooner the Megalithic-BRW culture arrived in the Deccan and in south India, iron technology and paddy cultivation, along with advanced methods of agriculture and tank irrigation, rapidly introduced elements of institutional development that ushered in civilization to these areas. Those who incline to this view, point to the homogeneous and uniform spread of the Megalithic culture in time and space. Others see the period from 1000 B.C., the time of its introduction, to the Early Historic period from the 3rd Century B.C., as one of such stagnation that it was incapable of providing an impetus for civilization.

The evidence outlined in this chapter along with the data described in the preceding one demands that we avoid these two extreme views - one arguing for a rapid development
of civilization and the other holding to a techno-cultural stagnation. In the first instance, during the early phase of the Proto Historic period, we do not find great changes within the Megalithic culture complex that radically altered the economic basis so as to distinguish it from the preceding Neolithic-Chalcolithic culture. Such developments depicting a sharp break begin to appear in some recognizable form only during the later phase or the post 5th/4th Cent. B.C. period. This situation also has its ecological implications. While the early phase of the Proto Historic period is predominantly associated with peripheral areas, the later phase is associated with nuclear areas.

In structural terms we may formulate the above situation in the following manner. The dynamics of early institutional developments indicate two basic aspects. At one level there is the vertical dynamic i.e., uneven development. This is apparent in two sectors. The first is the uneven development within the residential community in each nuclear area, where germs of social ranking result in a hierarchical status based on differentiated access to primary resources. Secondly, depending on the potential for development, there also exists a qualitative unevenness between the nuclear and the peripheral areas. At another level we see the operation of the horizontal dynamic. This is the socio-economic interaction and political

I. These phases varied in each Macro Zone. In Andhra c. 1000 to 400 B.C., Tamilnadu c. 800 to 400 B.C. and in Sri Lanka c. 600-300 B.C., may be considered as the Proto Historic period. The later Proto Historic and the Early Historic period may be considered as an overlapping one.
integration that began to develop during the later phase of the Proto Historic period and the Early Historic period within the Primary Region.

I - ii

The economy during the Neolithic-Chalcolithic and the early Proto Historic period, operated in two vital spheres. One may be termed the 'multi-resource broad spectrum subsistence pattern'. Here several resources are combined where the residential group may hunt, gather, tend cattle, conduct subsistence agriculture and even spend some time on minor craft activity (Flannery 1969:73; Habbet 1977:12). Alternatively, depending upon the nature of the localized resources certain groups may concentrate on a particular economic activity leading to 'local specialization', viz. hunting-gathering; fishing; pastoral activity; collecting raw material and the involvement in a particular craft viz. pottery, metal ware, beads etc. (Service 1975:75-78).

The archaeological evidence indicates that the basic production techniques in vogue during the Proto and the Early Historic periods may be generally categorized within the following economic and physiographic framework.

I. These economic categories cannot be strictly demarcated as water tight compartments. Nor do they imply stages of development reflecting an evolutionary process. The real situation was the coexistence of different techniques of production. As Barbara Bender describes, 'Food production involves the domestication of plants and animals. There is no break in hunting gathering and also food producing. Hunter-gatherers also manipulate plants and animals ... It is better to try and define the point at which the process has become irreversible' (1975:1-2, our emphasis).
It appears that the early neolithic communities in the southern Deccan were nomads. This is inferred from the absence of permanent houses from the time of the earliest habitations of the Neolithic (Allchin 1960:130; Subrahmanyam 1975:102). What is more relevant to our study, however, is the mobile cum sedentary groups, who are represented by the Neolithic-Chalcolithic and the early Proto Historic communities. Both these economic categories had a defined 'territory', which may be described as an area habitually exploited where resources were within convenient reach at a given technological level. Evidence given below also indicates that the 'territory' was demarcated by the 'ecological boundaries' (Newcomer 1972:7). Unlike the mobile economies, the mobile cum sedentary economies developed


B - Nuclear zones
new techniques of production that required a greater exploitation of localized resources. Hence a better defined geographical area was associated with the resident community.

The high frequency of bones of cattle among the skeletal remains and the association of certain ash mounds with some of these sites (Paddayya 1973:76; Allchin 1963:45; Nagaraja Rao et Malhotra 1965:89; Majumdar et Rajaguru 1966; Reddy 1976:116-117) along with the remains of sheep and goats (Thapar 1965:92; Nagaraja Rao 1971:134-5; Subrahmanyam 1975:74, 79) establishes pastoralism as the dominant feature of the economy of the Neolithic-Chalcolithic communities in southern Deccan.

By the end of the Neolithic-Chalcolithic period some sites even witnessed an increase in the animal population (Nagaraja Rao op.cit. 122). The above evidence may point to periodic rotations within a specific geographical area especially in the southern Deccan, where a mobile cum sedentary economy gradually took shape by the end of the Neolithic-Chalcolithic period.

This process of semi sedentarization was greatly supplement-

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I. The nature and the distribution of the ash mounds is a problem that has not been conclusively solved as yet (Mahalingam 1978:163-168). These are more often associated with the Neolithic-Chalcolithic cultures (Allchin 1960:163). It is, however, pointed out that this is necessarily not the case. In the upper Tungabhadra and in the Shorapur doab these mounds do not occur. The distribution of these mounds in fact appears to be limited to the Krishna valley (Sundara 1971:310). A statistical breakdown of the distribution of these sites indicates that only 35 out of 250 Neolithic-Chalcolithic sites coincide with the ash mounds in the southern Deccan (ibid.). More recently some strong evidence was brought to light which indicates iron smelting activity at least in association with some of these mounds (Sundara 1971:310; 1975:178; Reddy 1976).
ted by subsistence farming practiced by these groups. There is a high coincidence of Neolithic-Chalcolithic sites with areas producing ragi and kulti in southern Karnataka and western Andhra (Sankalia 1968:31). These crops flourish on dry, sandy, lateritic and even in hilly areas (ibid.). Among the domesticated plants, habitation sites of this culture have yielded remains of kulti (Nagaraja Rao et Malhotra 1965:91) and ragi (Vishnu-Mitre 1971:129-130). The perforated pottery found within the Deccan neolithic context was apparently associated with the preparation of a liquid diet based on kulti and ragi (Paddayya 1969:450-52). Though a fair number of Neolithic and Neolithic-Chalcolithic sites in the southern Deccan are largely confined to the plateaus (Krishnaswami 1960:50), some Neolithic-Chalcolithic sites, however, were located on the alluvial tracts of nullahs away from the hills (IAR 1967-68:3-4; Sundara 1975:164). Semi sedentarization may have had an impact on the expansion of the animal population at certain sites (Nagaraja Rao op.cit.1969:22) as well as in the expansion of certain cases during the end of the Neolithic-Chalcolithic period (Allchin op.cit. 45; IAR 1967-68:3). The positive relationship between the adaptation of a sedentary life and population growth has been relatively well documented elsewhere in the world on the basis of archaeological and ethnogra-

I. Soil and floral remains suggest a slightly damper climate than that which prevailed in southern Maharashtra and Northern Karnataka (Majundar et Rajaguru 1966:52-55; Vishnu-Mitre 1971:129-130; Dhavalikar 1973:143-144; 1975-76:144-45). This does not show a drastic climatic change in southern Karnataka and western Andhra which had an appreciable change in plant economy (Reddy 1976:114).
aphic evidence.

The agricultural technique may be graded as plot cultivation (Allchin 1960:132) and also limited swidden cultivation (Paddayya 1973:77).\(^1\) The digging stick and the hoe seem to have been utilized to work not only the regur soil of Maharashtra (Dhavalikar et Possehl 1974:44) but also the 'terraces'\(^2\) and alluvial tracts associated with the southern Deccan Neolithic-Chalcolithic culture. Subsistence agriculture\(^3\) was conducted through simple technology represented by the lithifacts such as hoe (and also the digging stick), picks, pestles, querns which have been regularly found within these culture layers (Subrahmanyan 1975:80; Reddy 1976:II8).\(^4\)

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1. It is suggested that the Tamil word tōṭṭam i.e. garden/plot derives from the root ṭōṇgu or 'to dig' (Caldwell 1976:547).

2. These terraces on castellated hills recall the devices used by the Proto Historic farmers of Baluchistan for agricultural purposes (Fairservis 1971:168, 171). Though it was believed these terraces in Karnataka were irrigational devices used as catchments for collecting rain water and silt (Sankalia 1968:32), it has been suggested that these terraces may have been utilized as habitations, for cattle penning and also for plot cultivation (Allchin 1960:130). 'The pattern of distribution of the sites show that they are located mostly at the feet, slopes and tops of the castellated granite hills with natural rock shelter, open spaces covered by granite boulders and perennial water cisterns ... The Neolithic man preferred to occupy the granite hills not for his habitation only but to exploit the trap dykes to manufacture his favourite pecked and ground stone tools which formed the chief artefacts of his technological complex' (Reddy 1976:II5; Nageraja Rao et Malhotra 1965:90; Sundara 1970:109; Paddayya 1973:75).

3. 'At Piklihal as elsewhere, tiny fields are to this day cultivated, often at considerable heights above the plain on terraces which bear traces of neolithic occupation' (Allchin 1960:130).

4. The bone formation of some cattle from the Neolithic-Chalcolithic at Hallur (Alur 1971:116-7, pl. xv, D2) and at
A good deal of hunting and fishing apparently supplemented the pastoral cum subsistence economy. The remains of antelopes, rodents, molluse, pig, spotted deer, bones of birds and fish have been recovered from the Neolithic/Neolithic-Chalcolithic levels of the southern Deccan (Nagaraja Rao et al. 1965: 91-92; Ansari et Nagaraja Rao 1969:35; Nagaraja Rao 1971: 122; 135).

There is no evidence for a radical alteration of this Neolithic-Chalcolithic subsistence pattern during the early Proto Historic period even after the introduction of a new technology i.e. iron, and a new crop i.e. paddy. On the contrary, archaeological evidence and also the textual evidence from a slightly later context suggests that, the pastoral cum subsistence farming tradition of the early Iron Age continued to remain so in peripheral areas even during the Historic Period.

We have already emphasised the high coincidence between areas housing the Neolithic-Chalcolithic sites and the early Iron Age sites in southern Deccan (Sundara 1975:154; supra).

Cont'd from pg. 77 ... Palavoy (Reddy 1976:54) are counted as a consequence of tilling and advanced agriculture such as ploughing. It is extremely unlikely that cattle were used for so-called advanced agriculture within such an undeveloped backward economy. Allchin is more correct in stating that such bone formations are a result of heavy transport activity and traction (I961:62).
Especially in southern Karnataka and western Andhra the ecological area of both cultures was identical and hence the continuation of subsistence agriculture (Sankalia 1968:31) and the pastoral tradition of a mobile cum sedentary society (Allchin I960:I37). Though rice was introduced during the overlapping period at Hallur, the cultivation of ragi (millet) was continued to the early Iron Age (Vishnu-Mittre I971:I29).

There is in fact little evidence for the need of a high yielding crop such as paddy which required a different ecology and a demography to develop. This is precisely why we do not come across either a new system of agriculture or new crops from the Iron Age levels at Piklihal (Allchin I960:I37). In the same manner Paiyampalli (where the Iron Age directly succeeded the Neolithic) revealed ragi/finger millet, horse gram and green gram (IAR I964-65:23; Allchin I969:325-26), and not paddy. Paddy appears to have been cultivated along with another crop in Karnataka. For instance, while some burials at Fraserpet (in Coorg) yielded paddy husks, another group from the same site revealed remains of millet (Gururaja Rao I972:I48). It is not surprising therefore that the Iron Age sites in the western regions i.e. the periphery (Telengana and Rayalaseema of Andhra) of Macro Zone I, which in all probability possess a higher antiquity over those in the nuclear area, coincide with areas suitable for the cultivation of dry crops and along narrow alluvial strips suitable for the limited cultivation of paddy.

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I. Paddy husks were employed as a tampering material within the megalithic context at Brahmagiri (Wheeler I947-48:208).
It was precisely within the same ecological zones that the Iron Age folk continued pastoral activities (Allchin 1960:137). It was also the continuation of this tradition throughout the Proto Historic period that earned the name Erumanādu for southern Karnataka and south west Andhra in the Sangam texts (Ahom. 294) and Mahāśāmanḍala for the same in the Pāli texts (Mv. xii. 3, 29). Some chieftains in this area took the personal name Erumai (Ahom. II5.5). Erumai, chief of the Vāḍukar (Lit. northerners) was clever in leading the tribe at cattle lifting (Ahom. 253:12-19). Even in the eastern sector what was to develop as the 'solid nucleus' based on a full-fledged agrarian economy, had a pastoral tradition. The stratigraphic evidence from Kesarapalle clearly indicates that the domesticated breeds were continued from the Neolithic-Chalcolithic to the Iron Age levels (Sarkar 1966:40, 43). The non-occurrence of a megalithic habitation site within the Nagarjunakonda valley (which however had a Mesolithic as well as a Neolithic-Chalcolithic burial cum habitation complex) and the evidence for buffalo sacrifice in association with megalithic burials there (Subrahmanyam 1975:177-8) may further indicate the semi-sedentarized character and the pastoral affiliations of the early Iron Age communities.

1. The etymological meaning of erumai is female buffalo (DED, 699).

2. Ethnographic studies indicate that there are nearly eighty odd nomadic and semi nomadic groups existing in southern Deccan. Some of them, such as the pastoral groups i.e. Gangireddulu or the Lambadis cover relatively large tracts during their periodic rotations (Misra 1969:80 ff; Allchin 1963:97, 108-9).
Hunting was continued as an important aspect of the subsistence pattern of the early Iron Age complex of Macro Zone I. A tabulation of iron objects from the habitation sites of the Megalithic culture in Karnataka (e.g. Hallur, Maski, Gandageri, Unachigiri, Gajendragad, Rajur, Jewargi, Andola, Halingali) (Sundara 1975:176-7), and also from the burial and habitation sites in northern and eastern Andhra Pradesh (IAR 1974-75:3-4; Sarkar 1966:74-166-182) revealed a wide range of implements of war and of the chase, which overwhelmingly outnumber other iron objects. The rock paintings at Hire-Benkal (Raichur) depict a hunting scene which has a horse rider wielding iron weapons (Sundara op.cit.183).

Excavations in the southern Deccan do not associate the earliest horse remains with the Neolithic but with the Neolithic-Chalcolithic, and mainly with the Megalithic culture (IAR 1961-62:32-3; 1967-68:33-34; Subrahmanyam 1975:175; infra pp.23-24).

The pastoral cum subsistence agricultural economy spread beyond the confines of the southern Deccan only with the community movement of the Megalithic culture, which initially covered the peripheral areas of south India. Though neolithic implements have been recovered from the far south at Madurai (supra. p.53 note I), neolithic habitations are confined only to the northern fringes of Macro Zone II bordering Macro Zone I.

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I. There appears to have been a definite decline in the consumption of molluscs during the Iron Age at Kesarapalle (Sarkar op.cit. 43). This may be due to a change in food habits or dwindling number of mollusc shells in the nearby fresh water tank.
South India perhaps has the best evidence where archaeological and literary data substantiate the above aspect in great detail. These texts mainly belong to the Early Historic period though they certainly reflect a pre-existing situation.

The Sangam texts mention a variety of sources from which the dwellers of the peripheral regions obtained their food. To mention a few, vedirnel (bambusa arundinaceae) was a seed obtained from a particular variety of bamboo (Koli 42.7) which is yet consumed by the hill tribes of south India. Vali is a vine having a sweet root (Kali 39.12) and was commonly found in the kuriṇchi and pālai regions (Kuruṇ. 216). Torai is yet another variety of bamboo paddy that grew in the kuriṇchi (Mudurai 287), which was crushed in order to prepare aval or rice flakes.

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1. In this context the ecological classification of the Tamila-ham in the Sangam texts is significant. The kuriṇchi (hills), pālai (arid land), mullai (pastures), neidal (littoral) and marutam (agricultural tracts) are not areas exclusive of each other. To elaborate, the pālai is often portrayed as the mountainous area in the kuruṇtogaï (Sambamoorthy 1968:28). In the Tamil epics pālai seems to imply seasonal change (Sivathamby 1974:26-27). For instance, describing the road to Madurai the Brahmin tells Kovalan how the mullai and kuriṇchi is transformed into pālai without rain (Silapp. xi. 64-65). This may indicate the idea of a dry mountainous region. Similarly it is also difficult to establish a clear distinction between the mullai and the marutam. It is suggested that mullai be considered as an intermediary zone of development (for subsistence agriculture cum pastoral activity) prior to the emergence of a full-fledged agrarian economy and its affiliated institutions in the marutam area (Sivathamby 1966:320-331). Similarly, the impetus given to the beginnings of political institutions in these peripheral areas cannot be underestimated (infra pp. 123-7). With the exception of what we categorize as nuclear areas viz. Kaveri lower plains, its auxiliary area in northeast Tamilnadu and sections of the Vaigai-Tambapanni plains, the rest of Macro Zone II may be included within the Sangam ecological zones viz. kuriṇchi, pālai and mullai which are associated with hunting, pastoral and subsistence agricultural ecologies. There is clearly a coincidence between the above eco-zones and the distribution pattern of the megalithic sites in the highland and the arid areas of Macro Zone II.

2. Shanmugam Pillai et Kudden identify mūnikil as bambusa.
Such food was obviously gathered by those dwelling in the kuriṇchi, pālai and the mullai areas. It is interesting to note that the four items in the hill country of Vēl Pāri that were not produced by the ploughman were bamboo rice, vallī, jack fruit and honey (Puram I09. 3-8).

In addition to these sources there were the cultivated varieties of seeds by the hunters and pastoralists in the kuriṇchi and mullai. Ulundi or black gram (phaseolus mungo-glab) and avarai or country beans (dolichos lablab) were cultivated and consumed in the kuriṇchi (Aṅguru 2II; Kurun 68, 82).

The most cultivated item perhaps was tinai or common millet which had varieties such as varaku and ēpal, that were cultivated within small plots in the kuriṇchi and in mullai areas (e.g. Nēr 259.3; Aham I2.6; Kurun I05.I, 394.I). It may be noted here that the coincidence between the megalithic sites and millet growing areas in Macro Zone II is only second to its coincidence with paddy growing areas (FAHS I962:22-23, map. I0 - 'Agro climatic region'). I The hill areas also grew a wild variety of paddy called aivam (oryza mutica) which was cultivated by hill tribes (Kurun. I00, 37I.2). A general description of the Kāṇvar (forest folk) states that they dug the ground for edible roots, cultivated tinai and trapped elephants for tusks (Aham 2I, 288, 292; Aṅguru 208, 268).

The hardships endured by the dwellers in these three eco-

Cont'd from pg. 62 ... arundinacea (I976;463 NO. 84).

I. In one case the poet describes his stay in the dark millet farm of the hill-chieftain (Narrinai 259.3).
regions show that existence was an eternal challenge in the peripheral areas. For instance, hillmen often had to protect their cultivated plot from various wild animals (Aingur. 261-262, 267, 287; Aham. 392. I2-I3). Dwindling natural resources prompted communities in the hill tracts to move their habitation en-masse for survival (Pupam. 240. 2-I4; Arokiaswami I956:52-54). The pastoralists (Kōvalar) in the mullai had to migrate regularly in search of water for their cattle and often they had to dig deep into the rocky-soil to obtain water (Aham. 79, 281; Padirru. 22.I2; Aingur. 304).

It has been suggested that the mullai economy i.e. pastoral cum subsistence agriculture, preceded the fulfledged agricultural economy (Sivathamby I966:320-331; Singaravelu I966:33-34). The impetus for subsistence agriculture obviously provided this basis for future developments. For instance, the term punam means the field for dry cultivation in the kuriñchi and in the mullai (Aingur. 284, 417; Aham 102.I, 386.I). The jungle tract in the hills (pulam) which grew tinaí is known as the puppulam in the texts (Aingur. 260, 283). The term pun also means not rich, hence puppulam may imply millet fields in the jungle tracts that are not rich. Incidentally the inhabitants associated with these were called Punavar (Aingur. 295). It is also suggested that pulam may have derived from the word pul i.e. grass/pasture (Singaravelu I966:33), which was the chief produce in the pastureland (PPTI I966:578). Hence the term puppulam for subsistence agriculture based on dry cultivation in the kuriñchi and in the mullai. It is suggested that the terms vitayar and mutiyal (Har I2I) appear to be associated
with the herdsmen who periodically conducted swidden cultivation (Sivathamby 1966:325). The hill folk cut down trees and burnt forests to prepare millet fields (Kurun. 214, 291).

More literary evidence given below also clearly establishes that even until the Sangam period (late Proto and Early Historic), the peripheral areas continued to function within a multi-resource broad spectrum subsistence economy. If we also correlate the archaeological evidence we may observe the following: Firstly, all peripheral areas viz. North Arcot, Dharmapuri, Salem, Western Coimbatore, Palani and the Agasthiyamalai are not only points of entry to the lower alluvial plains, they also possess a considerable number of early Iron Age sites; secondly, in spite of the introduction of new techno-cultural elements (iron, paddy, megalithic burials, the horse), the basic subsistence pattern did not make a major break from that of the Neolithic.

The subjects of Pulli in Venkaṭam, were not only pastoralists who also cultivated Varaku, they even trapped elephants for tusks (Aham 311.8-12, 393.5). Interestingly, to this day the burials in this area i.e. modern Chittoor district, are known as kurumbar kudi where the kurumbar also had a nomadic pastoral tradition dating back to the Sangam period (Purum 97). The kuravar hunters of Kudiramalai cultivated millet (Kurun 82, 95.1, 357.3), grew avarai as a second crop (ibid. 82) and also trapped elephants (ibid. 346.1). Their chief was called Eraikkōn (Purum 157.7), and both these terms viz. Erai and Kōn have a pastoral connection (infra p.14). Similarly the Maḷavar of Kollimalai who were ruled by ēri, cultivated
aivanam on flatland near water courses in the uplands, but
had to barter elephant tusks for food during lean periods
(Kurun I00). In fact the ancestors of Adigamān of Tagadūr
(of the same tribe) are credited with having introduced
sugarcane to Tamilaham (Puram 99.2). This in all probability
is the introduction of agriculture (Kailasapathy 1968:126).

The above areas approximately cover the northern uplands
of Macro Zone II. The megalithic remains indicate a good deal
of overlapping with the Neolithic-Chalcolithic in this area.
This factor along with the proximity of the northern uplands
to southern Karnataka may have formed the historical background
for the legend associated with the introduction of sugarcane
(agriculture ?) by the ancestors of Adigamān of Tagadūr
(Dharmapuri). Though the megalithic burials at Kavalagunta
in Chittoor have yielded paddy (Gururaja Rao 1972:183-4), the
ecology of the northern uplands is more conducive to dry
cultivation (supra pp.34ff). Therefore the continuation of
millet, horse gram and green gram even by the Iron Age folk
at Paiyampalli (North Arcot) is not surprising. Ethnographic
notes also confirm that the pastoral and subsistence agriculture
along with hunting-gathering was the economic pattern till
recent times in the northern hills of Tamilnadu.2

I. Even in the late 19th Cent. the Salem-Dharmapuri area was
infested with tigers and elephants (MDGS 1918:1, 35).

2. A sharp distinction was made in Salem between the land
that could be ploughed and land cultivated only by a hoe
(MDGS 1918:1,2II). The Goundars of Shevaroy hills in
Salem, cultivate dry crops such as rāgi, cholam, tīnai,
avarai, mustard, chillies, red gram etc tend to their cattle
and indulge in hunting and gathering (Natarajan 1936:107).
The reason that north Salem has intensive pastoral
Moving further south we come to other pastoral areas. The Sangam texts mention the Kongar pastoralists of Kongunadu (Coimbatore-south Salem). They were nomads who moved in search of water and pastures for their animals in rocky-arid areas (Aham 79.I-7; Padirru 22.I2-I6). The main source of water in a larger area of Coimbatore is through wells (Ratnam 1966:75-78) and even during the Sangam period these nomads obtained water from such wells (Aham 79.I-7). In the same area we also hear of chief Nalli of Totti hill, who possessed much cow's ghee produced by his shepherds in the forests (Kurun 210). To this day the ecology of Kongunadu uplands offers the best example for pastoralism and subsistence agriculture (Ratnam, op.cit.). Even slightly west of it in the Nilgiris, antiquarian remains and ethnographic studies on pastoral tribes such as the Todas strongly suggest that pastoralism in these areas is a tradition transmitted from the remote past (Rivers 1906; Leeshnik 1970:89-99; Emeneau 1974). Side by side, however, cultivations did prevail. The distribution of urn burials

Cont'd ... f.n. from p. 86 activities is the vast expanse of forest land extremely unsuitable for cultivation affording abundant pastures and unrestricted roaming ground for cattle (Littlewood 1936:126 ff).

1. Modern Coimbatore perhaps offered these pastoralists the best source of water and pastures. For instance, the place name Kinnarrukadavu in Polachi taluk literally means 'the entrance to a well'. The groundwater level in this area is relatively high and it often flows out of wells. This particular area is located close to the Palghat gap (Arokia-Swami 1956:54). The Alambadi breed is mainly found in the hills on either side of the Kaveri, or in the forests of east and south Kollegal and north Bhavani taluks. They are also found in south Hosur, west and southwest Dharmapuri taluks of Salem and also in the adjoining territory of Mysore (Swaminatha Iyer 1927:56).
along the alluvial tracts of rivers is a prominent feature here. Grain that looks like paddy was found in an urn from the upper Bhavani (Gururaja Rao 1972:96). To this day the Badagas '... make small fields upon rocky hill-sides, using stone retaining walls and little terraces' (Allchin 1963:104).

Within this pastoral context we may consider the evidence related to the Āy groups in the Sangam texts. They were predominantly concentrated along the southern hills (separating modern Tamilnadu and Kerala), though Adigamān of Tagadur also happens to be identified as an Āy (Sivaraja Pillai 1932:170). Āy Pañārā, the giver of large quantities of rice (Aham. 150. 20) held sway over the Potiṉ/Podiyil hills (Puram. I28.5) i.e. the Palani hills. Their major centre was also known as Āvinankūṭi (Murugu. I76; TLiv. 2547) or Āy kuṭi (Puram. I47.7). Āy Pekan also held sway over Āvinankūṭi (Śirupāṁ. 86-87; Puram I47.9). South of the Palani hills, the Sangam texts mention the NāṆṆilṆāṆ (‘ploughland’) of Āy Porunān (Puram. I37-I40), which approximately covered the area under the former state of Travancore (Sivaraja Pillai op.cit. I64-65). These areas that broadly covered the upper reaches of the Vaigai, Tampapenni and the Chittar were known as VēṇāṆu. Chieftain VēḷyāṆ Vēṃmān Āy

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1. It is said that he drove the Kongar nomads to the western sea board (Puram I30. 5-6). It is also recorded that after his death, Āy’s subjects left the territory due to a famine (Puram 240. 2-14).

2. The land on the banks of the Talaiṟu has also been named as his domain (Aham. I52.22).

3. It is possible that the term VēṇāṆu may have derived either from Vēḷ-nāṆu (Champakalakshmi 1975-76:121) or from “forest
Eyinam may have resided in this region which was infested with tusk bearing elephants (Ahám 208).

The Ay group was a section of the Velir invariably located along upland areas (viz. Dharmapuri, Palani, Agastiyamalai etc.) which are also points of entry to the lower plains. The term Ay seems to derive from a (cow) ēyar (cowherd) (PPTI 1966:85-86). Some Ay chieftains also took the title kō, which in all probability had a pastoral connection (infra pp.194-195).

The other interesting piece of evidence linking the Ay group to pastoralism in the past is, the term Ay kudi which is said to be their area of occupation. Later on in this chapter we shall explain the manner in which kudi while originally seeming to denote the socio-economic unit of the early pastoral society later came to mean the community and the region as well.

However, even during the early Christian era, the ordinary cowherd colony was called ay kudi (Nami xxvii.45), and the cowherd Ay or ēyar (PPTI op.cit.).

In terms of archaeological evidence we have already described various megalithic sites that are distributed in the

Cont'd ... f.n. from p.88 of bamboo*. The tall bambooos (naḷcilil neṭuvēy) growing near Podiyil hills have been compared to the shoulders of a lady (Ahám I37.I2-I6).

I. The Ay and the Velir claimed descent from the Yādavas (Champakalakahmi op.cit.). Some pastoral groups residing at the foot hills of Agastiyamalai in Tirunelveli still call themselves Yādavas and hold that they belong to the community of Ayarkulam, and are also called Idaiyans. Their caste deity Kriṣhna according to folk lore, also belongs to their community (Wambiar 1964:16). A similar situation is also found in southern Kārsntaka in relation to the Golla (originally Gopāla) pastoralists. They trace their origins to the north and adopt titles like Yadvaka kula and Kriṣhka kula (Allchin 1963:105).
Palani-Agastiyamalai hills which cover the upper reaches of the Vaigai, Vaippar, Chittar and the Tambapanni (supra pp.52-4).

The megalithic sites in the Tambapanni valley which appear to possess a relatively high antiquity indicate traits of early pastoral and subsistence agriculture. Adichchanallur in fact revealed an extensive area of ashes (at times several feet thick) mixed with bones and horns of animals (Rea 1915:6), which recall certain traits associated with the ash mounds of the southern Deccan (Gururaja Rao 1972:72-73). In addition, Adichchanallur burials have yielded many more representations of the buffalo and significantly often in bronze, than at any other megalithic site in the south (Rea 1915:v). As for agriculture, a good number of iron hoes ('mamuty' of Rea) found within these burials indicate the significance of this implement prior to the extensive use of the iron plough (Rea 1902-3: I36-I37, Figs. I8-21). Further, the extensive remains of grains of rice (oriza sativa) paddy husks as well as millet seeds (Rea 1915:5) clearly indicate that dry crops certainly prevailed in this area along with paddy. The variety of millet cultivated (panicum millaceum) which is locally known as samei (ibid.; Balakrishnan Nayar 1977:I65), is still grown in the Tirunelveli area, in the Nilgiris and on the hill slopes of Kerala (Rea, op. cit.; Misra 1971; Balakrishna Nayar op. cit.)

In addition to the subsistence pattern the types of crafts also did not radically alter during the early Iron
However, judging by the larger number of sites and the profuse occurrence of artefacts within the Proto Historic context, it is evident that there was an intensification of production during the Iron Age. It may be inferred that, depending on the nature of the raw material in the locality and in the adjacent areas the resident community developed the ability to specialize in certain crafts (vide Appendix - I).

An important aspect of the fields of craft is the gradual expansion, of the ceramic, bead and conch ornament industries by the end of the Proto Historic period. This situation developed due to various socio-economic reasons. At the same time there was a progressive decline in the production of lithifacts that were successfully substituted by iron. As utilitarian ware the iron substitute appreciated its functional value by the end of the Proto Historic period as a result of the growing emphasis on agriculture and craft production and also due to greater community movement towards the fertile lower alluvial plains.

I - v

Within the economic basis described by us, how do we

I. Some rudimentary form of semi specialization in crafts is evident by the end of the Neolithic-Chalcolithic. The occurrence of lithifacts, ceramics, and beads may be seen at these sites (Thapar 1957:106; Nagaraja Rao et Malhotra 1965:79-80; 92; Sarkar 1966:73; Nagaraja Rao 1971:94, 135-137; Ansari et Nagaraja Rao 1969:16). By exploiting the vast repository of Felspatho quartzite granatoid trap dykes in the neighbourhood, the Neolithic folk at Sangane-kallu established a vast microlithic factory site there (Subbarao 1947:210-211).
understand the dynamics of socio-economic interaction during the Proto Historic period in south east India? The Proto Historic communities we are dealing with may have in all probability belonged to segmentary lineage groups. As ethnographic evidence shows, the technique of production of the subsistence economy as well as the availability of resources, leads to segmentation of small groups of relatives i.e. the 'primary tribal segment'. Let us attempt to understand these 'primary tribal segments' by utilizing the empirical data available to ascertain the very basis of socio-economic interaction during the late Neolithic-Chalcolithic and the early Iron Age, that initially linked the family, community, economy, and finally the territory which had far reaching consequences during the Early Historic period.

What was the nature of the structural formation of the early residential community? Such residential communities may be considered as segmentary lineage groups that existed in the periphery as economically and politically autonomous localized 'primary tribal segments'. It is possible that the existing kinship system itself provided the basis for the segmentary lineage system. The Dravidian cross cousin marriage system goes back to a very early period in antiquity (Trautmann 1974), for which textual evidence is available in the Sangam sources (Hart

I. The 'primary tribal segment' is the smallest multifamily group (50 to 250 people), that moves from place to place and collectively exploits a section of strategic resources under the leadership of an acknowledged person. This 'band' or group periodically congregates with the rest of the tribe at a traditional meeting place for certain rituals and ceremonies (Sahlins 1961:325-6).
I974e40 ff.)\(^2\) and may have been extremely crucial in the structural formation of the segmentary lineage. It is suggested that this form of marriage is a reciprocal exchange of daughters between families and lineages to perpetuate alliances between them (Levi-Strauss 1969:Chap. 9; Hart op.cit. 40).

However, as Hart suggests, there is a second aspect related to the cross cousin marriage system, which in turn affects the lineage system. As against the parallel cousin marriage (where the kin nuclei is not an interwoven continuity), the cross cousin marriage makes the kin nuclei a tightly integrated whole (I974:41-44).\(^2\) Judging by the Sangam texts the Tamil 'kin nucleus' seems to consist of a woman's relatives i.e. a woman, her father/brother/husband/son (Beck 1974:1-283; Hart op.cit. 31-39). Considering her role in the subsistence economy as well as a crucial cementing factor in perpetuating the lineage system, the female was assigned a central role in the early Dravidian societies, the symbolic form of which extended even to the ritual structure of south India.\(^3\)

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1. According to the south Indian cross cousin marriage system, either one marries the mother's brother's daughter or the father's sister's daughter (Hart op.cit. 41).

2. This tightly integrated whole is seen in the kinship terminology itself. The Tamil word mama which means mother's brother, also means/includes father's sister's husband, and spouse's father. Similarly the reciprocal term marumakan includes sister's son (man speaking), brother's son (woman speaking), wife's brother's son, husband's sister's son, and daughter's husband (Trautmann op.cit. 88-89). Nun is the term used by the Todas for father in law as well as mother's brother (Rivers 1906:482).

3. For instance Koppavai was a prominent indigenous goddess who
The Sangam texts also show strong traits of parallel male domination. This is seen in the form of father/husband/brother playing a strong protective role over the woman as a means to avoid the intrusion of strangers, which may have in turn jeopardized their own control and domination within the lineage group (Hart 1974 31-34, 43-45). Thus, in reality, the position held by the woman as a central figure was a superficial one. As Hart sums it up, the cross cousin marriage in south India is motivated 'to some extent by beliefs regarding the power of woman and the need to keep that power under control' (1974:44). Unless this is so, we cannot reconcile the dual or the parallel situation, where on the one hand the lineage system is perpetuated through the cross cousin marriage system and by a central role played by the woman in the kin nucleus and on the other hand the concentration of authority, amongst segmentary groups, in the hands of a male i.e. perumakan (viz. maken:son, husband, exalted person, warrior – PED 3768), who as the head of the local lineage group identified himself with the clan/lineage ancestor (infra p.,218). Ethnographic evidence also shows that matrilineal systems are relatively rare in association with pure/dominant pastoralism, hunting-gathering.

Cont'd ... f.n. from p.,93 was associated with war and victory during the Sangam age (Hart 1975:23-24). The central position of Parvati in the structure of the south Indian Hindu pantheon is a prominent feature in determining her position vis-à-vis the male deities (Beck op.cit. IO-I2). It is interesting to note the personal name Erumai taken by certain chieftains of the Sangam age. The etymological meaning of Erumai is female buffalo (PED 699). The association of matriarchal traits with the Todas in the remote past has not been ruled out by Rivers who bases his arguments on certain rituals associated with the cattle and the pens (I906:548).
and fishing economies (Aberle 1972:664).

This socio-economic interaction based on segmentary lineage seems to have developed earliest within the pastoral cum subsistence agricultural economy where an association between the household or the clan (i.e., primary production-consumption unit) and the herd (i.e., the major economic base) became clear during the Proto Historic period. We may therefore find a strong clue in the Dravidian term kuṭi/kudi, its immediate and extended meanings as a key to understanding not only socio-economic interaction but also the elements of the 'primary tribal segments' as well.

At present the Tamil words kuṭi/kudi, kutumai and kutumban carry the meaning house, home, household, householder, family, lineage, town, tenants and even allegiance of subjects to a sovereign (NDE I379). Centuries of usage, primarily within an agrarian society, has obviously obliterated certain original meanings of the Tamil word kuṭi. This is very clear if one is to take the Tamil word kuṭi along with the Toda words kuig, kus (NDE I379) and kwasan (Emeneau et Burrow 1962:No. II0), which have a common origin in the Dravidian term kuṭi (chart no. II). The continued pastoral tradition among the Todas for centuries has a greater chance of retaining certain terms and meanings associated with pastoralism in their original form even at present (Emeneau 1974:Allchin 1963:102). It is possible, therefore that the term kuṭi, originally used to denote 'herd', later

! It is not known whether the prevalence of matronymics in association with the ruling houses of eastern and western Deccan of the Early Historic period, was the continuation of a remote tradition or due to family alliances that were forged by the ruling class.
came to mean 'family', the total residential community at one locality and the nuclear family, via its kinship links. The Indo-Aryan term gōtra seems to suggest a similar transformation and is best demonstrated by examining the term kwagam of the Todas.

At present the term kwagam conveys the meaning of 'the buffaloes/the herd of the clan' of the Todas (Emeneau 1974:23). Linguistic evidence suggests that kwagam originally meant only 'herd', which was later extended to the family, caste, genus and still later (the present meaning) 'the herd of the clan' (ibid.). The Toda word kūj, a derivation from the Dravidian kūji means 'the shed for calves'. An extension of this term is kūg, which means 'a room in the dairy/house' (PEE I379). The significance of these terms is the equation between 'the herd the house/rooms, family/clan', where there is an obvious link between the economic base and the family unit. The house (place of residence), the family (the immediate subsis-

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1. Even today cattle are herded in the courtyard and in the house itself at Piklihal (Allchin 1960:Pl. 60 b). The Lambadi village in the southern Deccan consisting of wattle and daub one-roomed huts with the cattle tied up in any available spot within the village gives the whole settlement an appearance of a cattle pen (Allchin 1963:109, Pl. II a). The average house of the iron smelting Asur tribes of Chota Nagpur consists of a sleeping apartment, kitchen and cattle shed (Leuva 1963:27). It is significant that the Tamil word patti implies, 'a fold for cattle, a pound, a small village' (Caldwell 1976:574).

2. The word tāy i.e., mother has been analysed in the following manner by Caldwell. Tā > tam, used honorifically to ā (cow) > ayyi i.e., 'mistress of the cows'. He also draws an interesting parallelism with the Indo-Aryan word duhitri i.e., daughter, but literally 'milkmaid' (1976:400-01).
tence group) and the clan (the extended kin group forming the tribal socio-economic complex).  

Chart No. 2

(Pravidian)

Kudi

(Tamil)   (Toda)   (Toda)

Kudi/kudi Kusgam Kuvi

Family   Flock/herd   shed for calves
House/home Family
Lineage   Caste
Subjects  Gens

Room in dairy/house

It is interesting to note that kudi is the term used for the clan as well as the place of residence during the Sangam period. Nachavar is known as Vajkudi i.e. the sword bearing clan (Perumbar. 157). According to our evidence above, the hamlets/villages housing the clan also came to be known as kudi. For instance, the tiny hamlet of the hunters is called Cirukudi (Murugu 196). Similarly, the small cowherd colony was the Sy kudi (Nani xxvii. 45). At times such clan villages belonging

I. There is strong evidence for clan or family ownership of cattle among the Todas in the past. Pastures are still held commonly by the clan (Rivers 1906:541, 557). We may also note that the term mad is used by the Todas for the clan village, the dairy, the sacred pen where buffaloes are kept and also for the funeral place (ibid. 24).
to one tribe were located close to each other. To quote an example, one poet describes the manner in which the kāsar of four villages in the hill, assembled under the banyan tree (Kūrūna I5.I).

It is evident that the greater exploitation of localized resources resulted in a better defined geographical area with the mobile cum sedentary economies and the residential communities. Thus we notice the relatively well established settlements on man-made terraces in southern Karnataka, western Andhra and the northern fringes of Tamilnadu. These were used as habitations, as cattle pens and cultivation plots (Allchin I960:130).

For example, the remains of wattle and daub houses at sites Tekkalakota, Sangankallu, Brahmagiri, Palavoy and Nagarjunakonda, Paiyyampalli more often reveal a circular ground plan, though rectangular plans are not unknown (Nagaraja Rao et Malhotra I965:Pl. III a, Fig. 8; Wheeler I947-I948:203; Ansari et I969:10; Subrahmaniyam I975:96-TOI; Reddy I976:115; IAR+I964-65:22-23).

Similar houses are described in the Sangam texts in relation to peripheral areas. The hut of the kūravār hunter living in

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1. Flannary makes an interesting generalization on the Pre and Proto Historic house types of the Near East. The circular dwellings according to him tend to coincide more with nomadic and semi nomadic societies, while rectangular ones are more associated with sedentary societies (I972:23-53; also see Oates I977:457-485). Circular huts are far greater in number than rectangular huts during the Neolithic-Chalcolithic and the early Iron Age of the Primary Region. To quote another example from a slightly different time and area, we may observe that during the 'prosperous' early Jorwe period at Chalcolithic Inangaon, the houses were rectangular in shape. During the period of decline i.e., later Jorwe period, when this community got absorbed into the Deccan Neolithic, circular huts came into vogue (Dhavalikar et Possehl I974:39).
the hills was small (Kurun 95) and its roof was thatched with
straw (Aham. 87, 172) or grass (Ainguru 252). The houses of
the hunters living in the Kollimalai were very small (Kurun.
100). In the mullai the house of the ayar was propped up on
short posts (Perumbar 148 ff).^1

It appears that a circular hut during the Neolithic-
Chalcolithic and the early Iron Age could accomodate 5-6 indivi-
duals. A circular one-roomed house at Sanganakallu has a
diameter of 5m. (Ansari et al, 1969:10). A similar hut belong-
ing to the late Jorwe period at Inamgaon measures 2.5 mt. (8 ft.)
in diameter (Dhavalikar et Possehl 1974:39). In all probabi-
life such a single-roomed hut housed the nuclear or the
elementary family. 2 A group of such huts was usually located
on a terrace of the castellated hills. A single terrace on the
castellated hill at Tekkalakota or at Sanganakallu approximately
held 10-20 such huts (Sankalia 1968:32). In the case of these
castellated hills, a terrace may have represented the lineage
sector or the clan composed of extended families. 3 More often

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1. To this day the Boyas of Tekkalakota live in circular huts
(Nagaraja Rao et Malhotra I965:101, Pl. xii-c, Fig. 32). The
house of a Kadar of Cochin is only a temporary leaf
shelter and is usually on a hilllock near a stream or natur-
al spring (Ehrenfels 1952:20).

2. A present Boya hut is generally 9 ft. in diameter and holds
about 8 to 9 people in it (Nagaraja Rao et Malhotra op.cit.).
The kadar house is also meant only for the single family
(Ehrenfels op.cit.).

3. The villages of each Toda clan are usually located in the
same part of the hill and the clan system in turn is
'territorial' (Rivers 1906:36, 540). Among the pastoral
Nuer of east Africa, the lineage is frequently associated
with the territorial unit (Evens-Pritchard 1974:203). The
a terrace at Tekkalakota could accommodate approximately 20 huts. There are about 20 such terraces at this site. If all terraces were occupied at one given time, the hill may have held a total population of about 2000 individuals (Sankalia op. cit.). In this sense, a castellated hill may have represented the tribal sector. Perhaps here we have the earliest representation of the segmentary lineage groups and it was such structurally, functionally and politically equivalent primary segments which ultimately formed the segmentary tribe.

The integration of the household cannot contain within it demographic expansion and with the consequent pressure on resources, which often results in conflict, may directly lead to a process of segmentation. The predatory expansions of segmentary lineage groups have been called a social means of intrusion and competition in an already occupied ecological niche (Sahlins 1961:323).

It would be interesting to pose the question whether the habitation and burial sites (often of the same type) located along the banks of rivers leading from the peripheral areas to the fertile lower plains, were a result of a linear movement in the process of segmentation. The very expansion of the Proto Historic culture from the peripheral uplands to the fertile alluvial plains is a clear indication of their want of primary resources for subsistence, perhaps due to a demographic expansion by the end of the Proto Historic period. The evidence

Cont'd ... f.n. from p. 99 group structure of the Gadulia Lohar take the form of concentric circles viz. individual household, ring of closely related families, sub band, major band, Gadulia Lohars in the same regions and in other regions (Ruhela 1968:85-89).
elaborated up to this point clearly shows the intrusion made by the iron using communities to various ecological zones and the amalgamation into their fold of the existing Neolithic/Neolithic-Chalcolithic or Mesolithic communities. An echo of this resource requirement may be seen in the term Vanji, which is defined as the expeditions led by land-hungry kings/chieftains of the pastoral areas into the adjacent forest tracts (Sirinivas Iyengar 1929:68; Sivathamby 1966:327).

Archaeological evidence also throws light on the movement of primary tribal segments. It is possible that these groups may have had their traditional clan or tribal burial grounds, where the corporeal remains of the deceased were enshrined in the megalithic burials. The repeated use of burials and the existence of burials not associated with habitations (e.g. Nagarjunakonda) may indicate the periodic use of 'family vaults' by clan or tribe. Cist burials having port-holes were specially constructed for the regular interment of skeletal remains and grave goods. The location of some ash mounds and the Neolithic-Chalcolithic/early Iron Age sites in the southern Deccan may give us a clue to such rotations by groups. Sites

I. The Mundas and Hos in Chota Nagpur, the Rodas and Badagas still conduct a system of double funerals. The first takes place at death and the other after a certain time lag. The second one is considered to be more important where the funerals for all deaths in the village take place on one day (Majumdar 1930:151-152). The Hos burn their dead in the house yard. Some time later the bones are picked indistinctly and are put into a new earthen vessel. Later on an agreed day they conduct the real burial ceremony. The bones may be buried in any of their clan villages (Macpherson 1930:167-8). The second burial may be the vestiges of an earlier custom when the tribe or clan actually interred the corporeal remains of a dead kinsman at the end of their periodic/seasonal movement in a tribal/clan burial ground.
such as Mudgal, Piklihal, Meshki, Sahapur, Tathni, Lingsugur and Amreshwar, for instance, are located on routes linking these sites (Allchin I960:1-2). The ash mounds associated with these sites definitely indicate periodic burning of the existing ash layer e.g. twice at Kupgal, Kodekal and Palavoy, three times at Tirth (Paddayya I973:72) and at least five times at Utnur (Allchin I96I), which shows that the, '... cyclic nature is a feature common to all the ashmounds' (Paddayya op.cit.). Some of these ash mounds may have been cattle pens, and also centres of cattle rites associated with pastoral and agricultural festivals, which were held by the nomadic/semi nomadic pastoral groups (Allchin I96I:74-75; I963).

Judging by these archaeological remains that could be supplemented with ethnographic evidence, certain sites with castellated hills and ash mounds in the southern Deccan may in all probability represent the traditional places of periodic gatherings of primary tribal segments for social economic and ritualistic purposes. At Kupgal, the local traditions associate the ash mounds there with the ancient Lambadis, the nomadic

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I. Amongst the Gadulia Lohars, the 'band' which is composed ofagnates have well defined traditionally recognized routes for the yearly cycle that varies from 50-80 miles range or 120-250 miles, that is coordinated with economic activities and the season. During every rainy season they have a fixed place of encampment and here leisure time activities, marriage, bullock trade in village fair, panchayat and visits are conducted (Ruhela I968:76, 8I, I43-5). The Todas of Nilgiri have clan villages named after its chiefs, and are located on the same side of the hill. During the migratory season very often the whole village accompanies the buffaloes. In the course of their migration, the Todas visit certain villages and dairies, that are traditionally regarded to this day as sacred for ceremonial purposes of the tribe (Rivers I906:23, 37, I23, 540).
pastoral carriers, who travel along prescribed traditional routes and often camp near these ash mounds (ibid. 97). I

I - vi

From the archaeological, literary and ethnographic evidence we are able to postulate that by the end of the Neolithic-Chalcolithic and the early Iron Age, some form of interaction began to develop resulting in socio-economic formation that gave an impetus to institutional development in southeast India. The beginnings of a purposeful planned exploitation of localized resources may have provided a stronger basis for the development of more sedentary settlement units. The process of gradual sedentarization in turn necessitated a more intensive exploitation of localized resources than under mobile economies. Hence there appear to be two primary aspects that give cohesiveness to the inhabitants within the household and the settlement unit comprising the nuclear family and the clan. This is irrespective of whether these societies operated a broad spectrum subsistence economy or conducted local specialization.

Socio-economic interaction is largely dependent upon the same resources and they become interdependent on each other for cooperative efforts. Such communal aggregates consequently have a greater degree of social homogeneity (Singaravelu 1966:

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1. The traditional cattle fair at Amreshwar (in the Raichur doab) is held at a spot in the jungle which is surrounded by Proto Historic sites. The ash mound at Gandur is less than six miles from there. People cover a distance of 50 miles at times bringing their cattle to this place. Similar fairs are held during major festivals generally where cattle play an important role (Allchin 1963:126).
This is where social interaction is greatest and cooperation most intense within the tribal infrastructure (Sahlins 1968:16). It is also the harmony established to a great extent by these kinship relations that go on to provide a corresponding concentration of households and exploitation of resources (Sahlins I978:124). This may be seen within the segmentary lineage groups of southeast India that existed during the Proto Historic context.

The second aspect is more an emphasis on the economics of the group. Ethnographic sources have a large volume of evidence to substantiate the idea that subsistence economies operate through 'simple technology' (Vidyarthi et Rai I977:103), where the "... basic apparatus can be handled by the household groups... implements are home spun... the same interest party can carry through the whole procedure from the extraction of the raw material to the fabrication of the finished good" (Sahlins 1978:79). An additional feature of the technology and the production aspect of the pre state societies of the Proto Historic period is the ability of the family/extended family as the unit of production, to control labour and the means of production. This is primarily due to the absence of a controlling authority that allot specific tasks of production. Labour is under the control of the household itself, property rights (be it cattle, the plot or sources of raw material) are normally held in common 'at the level of the family, hamlet, lineage or village' (Harris 1972:256).

I. With reference to shifting cultivators of India it is observed that '... often the land involved belongs to the village
The huge boulders that were moved to enclose the periphery of the castellated hills (Sankalia 1968:32), or the completion of the elaborately executed megalithic burials (where stones were transported from distant places at times), could not be carried out in a pre-class society unless there was concerted action by the residential community. Certain rock paintings of hunting scenes apparently representing Proto Historic communities e.g. Hire-Benkal, Ballapadai, clearly depict group-hunting where the males of the resident community participated in such concerted tasks. Similarly, archaeological evidence from a series of Neolithic-Chalcolithic and early Iron Age sites clearly indicates the existence of various economic activities at each site viz. hunting-gathering, pastoral activities, subsistence

Cont'd ... f.n. from p.,|04 community and is common property ... the individual households enjoy usufruct right and cultivation title during the period of cultivation as well as in subsequent cycles, ... among the Reddis of Andhra land belongs to the village community and is common property, ... Kondhs of Andhra land is not an object of sale or purchase, ... Savaras of Andhra the right of land is more than possession and less then ownership, ... therefore a system of cultivation title is enjoyed by the original clearer of the plot' (Banerjee 1972:106-107). This concept '... a field to belong to him who cleared away the timber ...' (Manu ix.47) prevailed in Early Historic India too. Although the podu (swidden) fields belong to those who cultivate them amongst the koyas of Andhra, cultivation does not confer permanent ownership. Neither the village nor the individuals have permanent rights to land (Tyler 1974:25, 30). It is interesting to note that podu, in the Sangam context, implied 'a common meeting place' (PTTI 609-10), which may have had an earlier association with places of gathering in the course of community movement by nomadic groups. Hence the regular rotation of cultivation plot held commonly at the clan or village level may have also acquired the meaning podu. There are strong evidence to suggest the clan and family ownership of cattle amongst Todas in the past, though land is still held commonly by the clan (Rivers 1906:54I, 557). The Agarias of Chota Nagpur have no private ownership in the iron-ore pits and there is no village ownership. The same area is simultaneously dug by groups, at times arriving from three different hamlets (Elwin 1972:176).
agriculture, and minor craft activities associated with lithi-
facts, ceramics, shell, beads and metals. Within the existing
technique of production of the subsistence economy, the residen-
tial community was also the production-consumption unit (vide
Appendix - I).

I - vi

The emergent economy during the Neolithic-Chalcolithic and
the early Iron Age which operated within "broad-spectrum subsis-
tence" or "local specialization"; necessitated a social interac-
tion at the lower level. This was where the family/extended
family, the clan or the resident kin group acted as the primary
production-consumption unit. This in turn initiated a far
broader interaction at the upper level involving inter tribal
and inter zonal relationships. During the Mesolithic,

II. Hallur (Iron Age) hunting, fishing, pastoralism, subsistence
farming, stone, bead, ceramic industries (Nagaraja Rao 1971;
I34-I37). Sanganakallu (Neolithic) hunting, pastoralism,
bead industry, microlithic factory site (Subbarao 1947:213;
1948:2, 31; Ansari et al. 1972, 16, 19, 34-37). Piklihal
(Neolithic) hunting, pastoralism, subsistence farming,
ceramic industry and iron smelting during the Megalithic
(Allchin 1960:10, 26-75, 78-108). To a similar broad
spectrum subsistence economy of the Neolithic at Falavcy,
iron smelting was added during the Megalithic (Reddy 1976:
39-87, II4-II9). Marine shells formed a part of the broad
spectrum subsistence economy at Kesarapalle (Sarkar 1966:
40, 43). The Neolithic and the Megalithic cultures at
Nagarjunakonda operated within a broad spectrum subsistence
economy viz. hunting, pastoral activity, subsistence farm-
ing, lithic and ceramic industry (Subrahmanyan 1975), and a
similar economy prevailed at Tekkalakota (Nagarja Rao et
Malhotra 1965). The Iron Age levels at Paityampalli and the
Megalithic burials also reveal a similar subsistence
economy, a range of crafts and iron smelting (IAR 1964-65:22-
23; 1967-68:26-30; Rea 1902-3; 1915).
Neolithic-Chalcolithic period, though a rudimentary exchange network prevailed in the southern Deccan and south India, it became relatively better established with the beginning of the Iron Age. The knowledge about new sources of raw material, the wider geographical area covered by the Megalithic culture, the growth in the number of sites of occupation and a probable increase in the demand for particular ornaments and utilitarian items during the Early Iron Age, intensified the existing network of exchange in relative terms during the Proto Historic period. Subsequently this exchange network appears to have provided the basis for the commercial infrastructure during the Early Historic period, where it grew in its dimension and not only integrated a series of raw material producing areas, exchange/craft centres, and trade routes spread over the Primary Region, but also linked them to areas outside the Primary Region.

With the limited evidence available, we cannot definitely state the nature of the exchange mechanism, or the quantification and the levels of consumption. It appears that the disparity or a variation in the proportional distribution of strategic resources, the nature of 'specialization' and the very availability of 'specialists' apparently resulted in a circulation of items in the form of raw material or as finished products. Similarly the nature and the proportion/volume of items that are required to enter the inter-community or inter-zonal production—

I. The specialist in this situation is one who has knowledge of a particular technique and not one who spends all his time making a particular object (Herskovits 1974:149).
consumption vortex was determined by the relative level of social development and the nature of demands for items made by these communities. We may also note that the circulation of items in pre-money, pre-class and pre-urban societies, was not conducted by a group of professional class of traders nor was it profit oriented.

The physical extent of the micro and the macro exchange mechanism may be described in the following manner.

Taking up the micro exchange mechanism first, it is apparent that even within the tribal sector certain strategic resources and the expertise was unevenly distributed. An entire group may produce some item not made or produced by its neighbours. Similarly the exploitation of a range of resources spread over an entire area may be restricted by custom to different groups where each may exploit a particular resource, the inevitable consequence being an exchange of items (Herskovits 1974:149-150). If the structure of the society is a segmentary one, then the interaction within the tribal sector was easiest within and between the segmentary lineage groups, which provided a convenient basis to facilitate the functioning of an exchange network in such societies. The exchange of items within such a context need not necessarily be conditioned by a demand for utilitarian items. Exchange or circulation was also initiated by periodic ritual ceremonies, as bride price, war booty and either by the accumulation or the redistribution of 'prestige' items by status seeking chieftains in a competitive society.

This form of micro exchange mechanism apparently prevailed in a rudimentary form even in the pre-Iron Age. Both,
Allchin and Misra describe an exchange process between the neighboring Mesolithic and the Neolithic folk in the Deccan (Allchin et Allchin 1974:64-65; Misra 1976:115-121). In the far south at T. Kallupatti in Madurai, the microliths found in association with the white painted BRW (JAR 1958-59:31) in all probability were obtained from the microlithic factory site at Tidian in the same area (JAR 1960-61:18). Similarly, if the segmentary groups spread in a linear pattern especially along a river valley, the movement of resources from one affinal group to another at a distance may not prove too many difficulties. This sort of 'down-the-line-exchange' (Renfrew 1977:77-9) may have operated along most river banks which often coincide with the Neolithic-Chalcolithic or Proto Historic habitation/burial sites. For example within the Tambapanni valley, the mica strips found in the burials of Adchchanallur (Rea 1915: iv, v; i, 6) were clearly obtained from the mica veins in the upper reaches of the Tambapanni (ICC 1968:63 Map). Similarly the chank shells from coastal Tirunelveli were found in the urns of Karivalamvandanallur in the upper Tambapanni valley (Cammiade 1930:Art No. 137).

From a slightly later context we read about the concentration of valuable or prestigious items, such as gold, iron implements, cattle, elephants, paddy, chariots etc., in the hands of the chieftains in the peripheral areas. Such items were held in high esteem and at times recirculated by redistributing them as gifts made to bards by the chieftains (Kailasapathy 1).

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1. The hill Vedans of Travancore use small chank shells as rings to this day (Hornell 1914:158).
I168:219-221 for a documentation of such gifts). In addition, periodic tribal warfare resulting from cattle raids i.e. vechi, was another mechanism through which these resources were obtained and redistributed (ToI. Porul. Pur; infra. Pp.224). Therefore 'these objects were not hoarded by the heroes but displayed and distributed' (Kailasapathy op.cit. 254). Through some mechanism that operated within segmentary groups there was a 'circulation of goods flowing towards the top of the social pyramid and down again' (Sahlins 1968:87; Fried 1967:117). It appears that the bards also visited hamlets during festivals where the exchange/circulation of items may have taken place in the peripheral areas. 2

The second is the macro extension of the exchange mechanism. In this case very often resources move from one ecological zone to another. This exchange may occur between communities operating within two different ecological zones, which are more often inter-tribal sectors. In the macro exchange mechanism the network covered a larger physical area where items tend to move relatively long distances.

In this connection, the distribution of chank shell is a case in point. Whether its source was the Arabian sea or the

1. According to Singaravelu, the origin of gift barter may be postulated from a variety of poetry called Arruppatai. This was a literary device by which a poet described those who received gifts from a patron and could guide another bard to the same patron (1966:10).

2. The bards seem to have followed regular routes or paths in order to praise the chieftains in the peripheral areas. The Sirupapparrupadai apparently describes such a route followed by the bards (M.S. Venkatasamy cited in Singaravelu op.cit. 52-53).
Gulf of Mannar, this item has been found in centres located at great distance from the place of origin. In the south, the marine-littoral ecology was a different entity from the other existing ecological zones in the Primary Region. By the late Proto Historic and Early Historic periods we are aware that a particular community i.e. the Paratavar, specialized in exploiting the strategic resources in this ecological zone.\(^1\) In addition to the coastal sites, chank in the form of shell or as ornaments have been found in south Indian sites viz. Wallampatti (Coimbatore), Tirukkampuliyur and Alagarai (Tiruchirapalli), Mohanur (Salem), Oduguttur and Peiyyampalli (North Arcot).\(^2\) This not only clearly shows routes moving from the coastal areas to inland habitations of south India, but that these inland sites in North Arcot, Salem, Coimbatore and Tiruchirapalli linked coastal Tamilaham with the southern Deccan. The southern Deccan in fact had a good concentration of chank factory sites during the early Iron Age (supra pp.144-5). It has also been suggested that even during the pre-Iron Age that certain resources moved to distant places from their

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1. Though the antiquity of the Paratavar is uncertain, it is quite probable that they were the descendants of the Proto-Austroloid groups that lived in the coastal areas of Tamilnadu and northwest Sri Lanka during the Mesolithic period. These mesolithic people in Tirunelveli appear to have been familiar with the chank (Reuner et Allchin 1956: 13). It seems likely this resource may have been exploited from a very early period. This is substantiated by the presence of chank and pearl oyster in great abundance in every part of the stratified alluvium at Korkai (Caldwell 1981:284).

2. The largest number of backward tribes and castes wearing chank ornaments in Tamilnadu are still concentrated in these districts (Hornell 1914:170-175).
places of origin. For instance, the gold from southern Karnataka apparently was channeled to the Harappan sites through some exchange mechanism (Marshall 1931:29-30, 524). The recovery of 73 beads of lapis lazuli (which is found only in Badakshan), from the cist burial site at Raigir, district Nalgonda, Andhra Pradesh (Beck 1930:Art no. 134), not only indicates one item that may have moved southward in exchange for gold, but also the distances involved in this exchange mechanism. The Mesolithic folk at the Teri sites in Tirumelveli 'imported' chert and quartz to fashion their microliths (Pooce 1916:50). They may have even exchanged chank for these raw materials. The same is true of the gold from Karnataka that found its way into the Iron Age burials of Nagarjunakonda (Subrahmanyan 1975:209). The same burials yielded tin, which is definitely foreign to this area (vide Chakrabarti 1979a:63). The copper bronze items found in the burials of Adichchanallur were obvious imports to this area (Rea op. cit.).

Certain notices in the Sangam texts describe the form of exchange that existed between ecological zones. This clearly reflects a situation that prevailed during the Proto Historic period. It is described that honey and edible roots were exchanged for fish fat and wine while sugar cane and roasted rice for toddy and deer flesh (Porunar, 214-221). These items of exchange were the products of different ecological zones. The Kallar and Malayar tribes in the peripheral hill forest tracts bartered elephant tusks for paddy (Ahem, 61; Kupun 109). These hillmen hunters often found gold and precious stones (Ahem 282) which ultimately reached an exchange network.
THE EXCHANGE NETWORK AMONGST THE NILGIRI TRIBES

SOURCES
RIVERS 1906
HERSKOVITS 1974
VIDYARTH ET RAI 1977
We also hear of those in the littoral area frequently exchanging salt for paddy from those in the marutam area (ibid. 140; Kurun 269).

It also appears that the 'factory sites' were a vital sector in this macro extension of the exchange mechanism. These were obviously production-distribution centres. They were at times conveniently located close to the resources. For example, Sangankallu was a large microlithic factory site exploiting the quartzite in the neighbourhood (Subbarao 1947: 210-211). Apparently a communication route connected a series of Pre and Proto Historic sites Raichur and Bellary (Allchin 1960: I-2). Alternatively such factory sites were located conveniently between the source and the other neighbouring sites. We have suggested the existence of such centres for iron manufacture, a tradition that continued until the early 20th Cent. in the Deccan and south India. To quote another example, Tirukkampuliyur and Alagarai are most conveniently located in relation to areas producing semi precious stone in north and western Tamilnadu and also to the Proto Historic sites in the middle Kaveri valley. It is therefore not surprising that a bead factory site existed from the earliest levels at Tirukkampuliyur (Mahalingam 1970:31). Similarly, a large number of worked and

I. Perhaps the best ethnographic example from the primary region illustrating inter tribal and inter zonal exchange network comes from the Nilgiri hills. Here the Todas (pastoralists), Kota (artisans), Badaga (agriculturists), Kurumber (hunter-gatherers) have an elaborate exchange network sustaining each other. This network operates within about 500 sq. miles and has been recorded earliest by Finicio in 1902, which in all probability may have a higher antiquity (Rivers 1906:Appendix I; Chart No. III).
unworked chank shell from Period I at Tirukkampuliyar and Alagarai revealed the existence of a factory site (ibid. 49, 106). In all probability the chank moved along the Kaveri valley from the coast and was converted into ornaments here that may have been supplied to the sites in this area. The same applies to the chank factory sites in the southern Deccan, where over 95% of them are located in a (rectangular) area of 250 X 150 miles covered by the districts of Mysore, Raichur, Bellary, Anantapur and Kurnool (Hornell 1914:48). I

The reason for this remains unexplained. Possibly, southern Deccan was most conveniently located between the source areas in the far south and consumer areas i.e. the contemporary Proto Historic sites in northern Deccan and the Early Historic sites north of the Vindhyas. Hence the localization of this industry here is not surprising. Kautilya in all probability had in mind these chank ornament producing centres that could be reached by travelling along the dakṣināpatha, which is said to have traversed areas producing other valuable raw material as well (Artha vii.12.24-25).

The mechanism by which raw material or finished products moved to relatively distant places cannot be explained in definite terms. We have no evidence to indicate the existence of a mechanism similar to the 'kula ring' (Malinowski 1922) in the southern Deccan and south India. Judging by the occurrence of chank even during the pre Iron Age at distant places, its

I. Even at present the nomadic Lambadis continue to obtain their chank ornaments from the Raichur side in Hyderabad (Hornell op.cit. II6), which may be the continuation of a tradition in antiquity.
intensity of occurrence and its frequent association with burials including the ethnographic notices on chank as a primitive medium of exchange, may permit us to suggest that this particular item moved in a regular circuit and had a value in terms of exchange and prestige associated with it even during the Proto Historic period. The widely distributed disc-beads having an almost uniform weight, have been suggested as a medium of exchange during the Neolithic-Chalcolithic of the Deccan (Sarkar 1973-74:59-63). The above assumptions require confirmation based on greater supporting evidence.

We may, however, suggest two possible mechanisms that may have carried particular items to relatively distant places. Depending upon the degree of utility or prestige value associated with an item, it may move from one ecological zone to another via inter-tribal sectors. Alternatively, it is possible that certain nomadic groups may have acted as carriers of raw material, finished products or even as itinerant craftsmen. Archaeologists have not ruled out the existence of such a network supplemented by nomadic pastoralism even during the Harappan period (Possehl 1977:252 ff; 1979:537-551). A similar idea has been suggested by B. Allchin where the Proto Historic pastoralists in the Deccan closely integrated their movements with the relatively more sedentarized groups (1972:

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I. Cowrie shells were a common medium of exchange in pre-British India. Chank was a form of exchange currency in Assam even in the late 19th Cent. The Nagas used chank shells with a fixed and thoroughly well-determined exchange value relative to the price of all articles of trade. Slaves and cattle in particular were valued in chank shells. Even ransoms of villages captured during raids were paid in chank shells (Hornell 1914:165-6).
This has been described in detail pointing out the significance of the ash mounds, regular routes followed by pastoral nomads, festivals associated with community gatherings. Pastoral nomadism in the southern Deccan, Kongunadu, and the western hills of Tamilnadu (Nilgiri, Palani) during the Proto Historic period has been already stated. The existence of a whole group of chieftains who had accumulated certain prestige items, were located in the western hills of Tamilnadu, especially in areas with mountain passes linking the eastern and western coasts (supra pp. 46-7). These areas naturally witnessed a movement of inter-zonal resources most probably carried through by pastoral nomads. We have already commented upon the bone formation of cattle from Proto Historic sites the result of carrying heavy loads. During the Sangam age the ass and cattle were used to pull carts and carry heavy loads in the peripheral areas of Tamilaham and the southern Deccan (Aham 173, 8-18; 207). While the present day Lambadis continue the tradition as carriers (Allchin 1963:97), cattle were used as carriers until the 19th-20th Cent. to transport iron ore from the source to a smelting centre which at times was located beyond 30 miles (supra Ch2P). It appears that the word podiyil (another name for Palani hills) is a corruption of poduIl > from podu which means a 'common meeting place' (PPTI 1966:609-10), perhaps for groups arriving from different areas.

I. A survey made in Karnataka and Andhra revealed the existence of 60 odd nomadic and semi nomadic groups. In addition to pastoralism, groups were involved in hunting/trapping/fishing, blacksmithy, mat making, stone breaking, amusement/acrobats, trading (cattle, animal skin, vessels, perfumes etc.) (Misra 1969:80-81).
By the end of the Proto Historic period when agriculture achieved greater significance in the economy, the settlements in the fertile tracts had to depend upon carrier groups, as raw materials were largely concentrated in peripheral areas. In addition to carriers as raw material and other services related to the agricultural economy, these settlements may have obtained the services of nomadic groups even as carriers of finished products and as itinerant craftsmen. To quote an instance, Leshnik has suggested that the bronze objects recovered from the burials of Nilgiri hills, may have been purchased from itinerant smiths from the bazaars of the lowlands (Leshnik 1970:92-93).

The present section underlines the emergence of the nuclear zones as areas with potential for advanced institutional development in the Primary Region. The sections enumerated up to now indicate that in the short run, the introduction of iron and rice cultivation did not lead to significant institutional innovations and other allied developments. There was only a

I. These pastoral groups maintain regular routes, seasons and camping places in the process of interaction where they offer various services i.e. milk products, bullocks for heavy work, sale of cattle, manuring of fields, production of agricultural/household implements, transport of goods from one site to another, sale of items etc. (B. Allchin 1972:117 ff.; Misra 1968:165-171; Ruhela 1968:146 ff.).

2. Todas at times travel about 30 miles (15 X 15) along hill tracts for a supply of grain (Rivers 1906:19).
gradual appreciation of the functional value of the iron
technology. Similarly, the development of a rice based economy
also extended over a period of time. This did not, in any case,
imply the termination of other production techniques such as
food gathering, hunting, pastoral nomadism or subsistence
agriculture, based mainly on dry crops, that prevailed primarily
in the peripheral hilly and pastoral areas in association with
the stone-using and the iron-using communities during the early
Proto Historic period.

The Proto Historic techno-cultural matrix was not only
relatively homogeneous, it had also spread over various physical
and ecological zones. It is also significant that in spite of
this techno-cultural homogeneity, certain physical and ecologi-
cal zones underwent more advanced stages of institutional
development over others. The vertical dynamic exactly represents
this situation i.e. the qualitative unevenness between physical
areas in terms of their potential for development (supra p., 2).
This unevenness came to be characterized by differentiated
levels of institutional development. For this purpose we have
to grasp the essentials of internal and external developments
associated with the material basis of the Primary Region, which
led to the evolution of an agrarian economy in the nuclear area
i.e. the lower alluvial plains.

It is said that the initial impetus for institutional

Cont'd ... f.n. from p.,18 Moving on flat land, within 5-6 months
(approx. Oct-Feb), a Gadulia Lohar 'band' visits around 28-
30 villages (Ruhela 1968:145 ff). The Gadulia Lohar may be
shown as an excellent example of a nomadic group who provide
various services to the settled communities in addition to
being itinerant black smiths.
development in the alluvial tracts had its origins in the peripheral pastoral areas. If that were so, why did the communities in the peripheral areas fail to carry out this historical task to its logical conclusion within that particular ecological context? And again, what was the reason for the non-emergence of the 'early state' and its allied socio-economic hierarchy based on a class society in the peripheral areas?

Certain contradictions inherent in the economic infrastructure of the peripheral areas apparently had a crucial role to play in limiting the ability to evolve towards advanced institutional development. The emergence of the nuclear areas in the alluvial plains, initiating advanced institutional development, may be viewed as a consequence of the dialectics of socio-economic change. On the one hand the structural weakness in the functioning of the mobile and mobile-cum-sedentary economies which resulted in peripheral areas remaining institutionally backward throughout history. On the other hand, the process of socio-economic interaction did not permit even peripheral societies to be devoid of change. The early Proto Historic society, for instance, was by no means static. It is precisely such socio-economic interaction within the pastoral cum subsistence agricultural economy that released gradual but perceptible forces of change which became much more apparent and had far reaching consequences in a different ecological context.

A major weakness of the Proto Historic mobile economies in the Primary Region was their non-sedentarized character with periodic shifts in the 'ecological boundaries'. This gave no potential for achieving a surplus economy associated with
sedentarized societies. Though migratory grazing practiced by the pastoralists in India represents a most efficient pattern of resource use (Jodha 1972:25 ff.), these economies could never evolve integrated territorial units associated with communities in the Primary Region. Besides, their limited economic self-regulation and instability are shown as one of the predominant negative aspects of nomadism (Khazanov 1981:156). In a mobile economy territorialism based on land does not develop. 'What is appropriated and reproduced here is only the herd and not the soil' (Marx 1857-1859 cited 1979:105). Property relations associated with immovable resources could develop only with proper sedentarization, which is also one method of overcoming the economic onesidedness of the nomads (Khazanov op.cit.).

Certain late Neolithic-Chalcolithic and early Iron Age communities attempted to overcome some of the structural disadvantages associated with a pure mobile economy by resorting to subsistence farming based on plot or swidden cultivation. This new feature came to be acknowledged as an integral part of the multi-resource broad spectrum economy. However, due to certain social and ecological factors associated with these economies in the peripheral areas, even subsistence farming did not lead to structural transformations i.e. it was incapable of initiating the more advanced forms of social change associated

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I. General characteristics of swidden cultivation cannot be indiscriminately applied to all areas of the globe practicing this method of agriculture (Conklin 1961:27-61). Therefore, we have chosen such elements more applicable to the south Asian context, the period and area under consideration.
with an economy based primarily on agriculture. This may be shown as the primary draw back associated with this production technique (vide Appendix - I).

We may therefore evaluate the significance of rice cultivation during the early Iron Age, which is more often assigned a prominent place as a force that gave impetus to civilization.

The discovery of rice from the overlapping Neolithic-Megalithic level at Hallur is significant on two counts. Firstly, it confirms the cultural context of rice i.e., its introduction along with megalithic burials, BRW and iron to the southern Deccan. Secondly, it also assigns an approximate chronological point to the period of introduction i.e. c. 1000 B.C. Thus rice was known from the early Proto Historic period.2

This brings us to the actual functional context of rice, or the main features associated with rice cultivation during the early Proto Historic period. Firstly, empirical evidence show that rice cultivation was conducted in peripheral areas. In addition to Hallur (Vishnu-Mittre 1971:129), traces of rice/ paddy were revealed from the Megalithic context of Brahmagiri

1. It is relatively clear that rice was introduced to Hallur from the northern and western Deccan. Oryza sativa, the variety of rice found at Hallur, was also recovered from the Chalcolithic context at Inamgaon, Navstoli, Lothal and Rangpur (Alchin 1969). We cannot however rule out the possibility of this variety reaching southeast India from eastern Deccan, more specifically from Orissa. The Neolithic rice of Orissa is known to be Oryza sativa, which is also the dominant variety in south east Asia (Balakrishnan Nayar 1977:152-3).

2. On the basis of certain notices in the writings of the prophets Ezekiel and the Second Isaiah (dated to 6th Cent. B.C.),
(Wheeler 1947-48:208), upper Bhavani (Gururaja Rao 1972:76), and Frazerpet in Coorg (Cole 1869:54-9). In the Sangam texts, Veppel, tōrai and aivam are described as three varieties of wild rice gathered/swidden cultivated by the hill tribes of Tamilaham (Malai padu II5, I2I; Madursik 286-288; Kurun I00, 37I.2).

Secondly, the introduction of rice did not necessarily result in a drastic change of the existing plant economy associated with subsistence agriculture. For example, rice does not feature within the plant remains revealed at Paiyam-palli or at Piklihal, two sites in the periphery that continued the Neolithic crop pattern to the Iron Age (IAR 1964-65:23; Allchin 1969:325-326). In certain other areas rice coexisted with dry crops. For instance, at Frazerpet in Coorg, remains of paddy husks and millet were found within the same burial site (Cole op. cit.). In Pudukottai, paddy and other grains were found in burial urns (Gururaja Rao 1972:88). Even at Adichchanallur, a site within the nuclear area, excavations revealed heaps of millet and rice from its burial urns (Rea 1975:5).

Thirdly, the introduction of rice cultivation did not suddenly terminate the existing multi-resource broad spectrum subsistence pattern in the Primary Region. This clearly shows that, during the Proto Historic period, rice was not universally

Cont’d ... f.a. from p.122 it is suggested that rice was exported from south/western India to the Middle East (Rabin 1966).

accepted or developed as a staple diet by the Iron Age folk. Even after the emergence of civilization in the lower alluvial plains, the broad spectrum subsistence economy persisted in the peripheral areas, the bio-climate of which is in any case more suitable for hunting, pastoral activity and dry crop farming.

Fourthly, the archaeology of the peripheral areas do not indicate a rapid demographic expansion during the early Protohistoric period. Hence, the introduction of rice cultivation did not, apparently, accompany or coincide with an expanding population. Elsewhere, at Chalcolithic Inamgaon, the earliest occurrence of paddy coincides with the period of demographic and cultural decline at the site (Vishnu-Mittre et Savithri 1975-76:56).

Fifthly, there seems to be an equation between limited cultivation and limited technology. To elaborate, limited scale rice cultivation associated with subsistence farming, does not require an infrastructure consisting of advanced agricultural implements, irrigation facilities, draught animals or advanced social organization for production tasks. We have already stated that wild varieties of paddy seems to have been gathered/cultivated in the peripheral areas. Such a situation does not demand advanced agricultural techniques or social organization at the operational level. 

I. An inferior variety of paddy known as Valan, grows in the water logged areas of western Tiruchirapally, and it does not require ploughing or irrigation (Ratnam 1966:47). In Sri Lanka, certain marshy areas at Kotte (near Colombo) grow a particular variety of paddy which is sown during the dry season, and does not require ploughing, manuring or irrigation. There is also reason to believe that in some low-lying regions of southeast Asia, rice was originally
In addition, even in the field of iron technology, there was no significant innovation, especially in agricultural implements, capable of infusing greater efficiency to production e.g. plough cultivation. The existing repertoire of iron implements, like the hoe, adze, axe, sickle etc were sufficient to perform all functional tasks associated with limited cultivation. To elaborate, we may point out that, archaeological sites yielding the above range of implements from the Proto Historic context, are located in peripheral and in nuclear areas as well. As much as the iron sickle is found at Paityampalli (IAR 1968-69:2), which is located in a non-rice cultivating area, the same is found at Sanur (Banerjee et Soundaranajan 1959:34), which is essentially in the rice growing area.

Similarly, iron hoes have been found within the burial urn at Kilpauk in Madras and at Adichchanallur (Ragahavan et Devasahayam 1974:2; Rea 1902-03:16-7, Figs. 18-21), which are again two major rice cultivating (vide Appendix - I). Hence, the mere use of iron or the association of rice with iron technology, did not necessarily lead to a proliferation of this crop and the consequent emergence of an agrarian economy.

Cont’d ... f.n. from p. 124 ‘gathered’ from marshy areas rather than cultivated during the Neolithic and the succeeding metal age (Nabnet 1977:4-5).

I. In the western and northern Deccan, rice was cultivated in the pre Iron Age. The late Harappan people at Lothal and Rangpur IIIA cultivated rice (Gosh et Lal 1963:168). At Chalcolithic Inamgaon, remains of rice have been found from the overlapping period between the early and late Jorwe cultures and also from the Late Jorwe levels (Vishnu-Mittre et Savithri 1975-76:56). Contrary to Kosambi’s assumption (1975:69-70), the plough was known within the north west Indian Chalcolithic context e.g. pre-Harappan Kalibangan
To this we may also add another aspect related to the technology. There is no clear evidence to show the evolution of improved hydraulic technology during the early Proto Historic period. In a sense this factor may have been largely responsible for the relative paucity of Krishna and Kaveri in spite of the fact that the Iron Age folk possessed tools capable of clearing the sub tropical forests. It has been suggested that, the terraces associated with the castellated hills possessing Pre and Proto Historic sites in Karnataka were catchments for collecting rain water (Sankalia 1968:32), though archaeological evidence tend to associate these terraces more with habitations, cattle pens and cultivation plots (Allchin 1960:130). To take another case, stratified excavations at Rakhamgeri (in Karnataka) revealed that the Megalithic-BRWM remains pre-date the irrigation works at that site. The bund of one irrigation tank clearly conceals a menhir of a buried stone alignment, while the core of the bund also revealed Early Historic pottery (Sundara 1975:155).¹

Cont'd ... f.n. from p.125 (Thapar 1973:266-277; 1979:198).

The black cotton soil in Saurashtra (Kathiawar) and Maharashtra, does not necessarily require a plough for cultivation purposes (Leshnik 1973:82; Chitalwala 1977:96-7; 1979:114-116; Dhavalikar 1973:141-3; 1975-76:45-46; Dhavalikar et Possell 1974). The nature of the iron technology that evolved in relation to agricultural implements in northern Deccan was suitable to its soil region. For instance, the iron content of an axe from the Proto Historic site at Mahurjhari (in Maharashtra) is 99.1 % (Deo 1973:77) and an iron hoe from the Early Historic smelting site at Dhatwa (Surat District) indicated that the iron content is as high as 99.76 % (Hegde 1973:402-3). As a consequence the iron becomes soft (ibid.).

I. The megalithic habitation sites at Vibhutihalli and Rakhamgeri are described as those situated near the hill valleys from which the rain water flows into the fields cutting in fact a part of the site at the former and are thus within the catchment area of the bounded water of the present irrigational tank raised across the valleys (Sundara op.cit.).
At Vellur (near Adichchanallur), a group of urn burials was recovered from the bed of an irrigation tank (Rea I902-03:III-II2). The proper chronological context in this case is not too clear, though it is suggested that an amalgamation of seven other pre-existing tanks/wells went to make up the present tank during the British period (ibid.). Village tanks in certain peripheral areas, such as Salem, saw a relative increase in number, as late as 900 A.D. (Wurton I973:59). Even the Sangam texts attest to the fact that peripheral areas such as Kongunadu, a typical pastoral cum subsistence agricultural region, primarily depended upon wells for water.

Boserup sums up the above situation in the following manner. 'In a region where this critical level of density has not been reached, people may well be aware of the existence of more intensive methods of land use and they may have access to tools of a less primitive kind; still, they may prefer not to use such methods until the point is reached where the size of the population is such that they must accept a decline of output per man-hour' (Boserup I965:41).

In addition to reasons enumerated above, the apparent backwardness of the peripheral areas throughout history, makes

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I. It is believed that the huge embankment wall (240 mt. long 2.25 mt. wide) at Chalcolithic Inamgaon, diverted water from a (4 mt. wide 2.50 mt. deep) channel (running parallel to the dam), which was fed by the nearby stream. This water may have irrigated the low lying fields (Dhavalikar I975-76:47-48, 45 fig. I). The ecological and socio-economic structure at Chalcolithic Inamgaon was far more complex and different to that of the Proto Historic mobile cum sedentary societies of the Megalithic culture. Hence, we cannot hold the former as a case in point for a technological parallel even if we assume by inference that advance irrigational mechanisms were in vogue during the early Iron Age.
it clear that rice cultivation in itself could not be a prime factor leading to institutional development and structural transformations. The significance of rice — as a crop possessing greater potential (over most dry crops in the Primary Region) for a surplus production and also as a durable staple diet capable of sustaining larger numbers — was essentially appreciated only with the coincidence of a new environmental, demographic and technological situation by the end of the Proto Historic and more specifically with the beginning of the Early Historic period.

I & viii

The evidence outlined above may suggest that neither semi-sedentarization nor the combination of subsistence farming and pastoralism was able to overcome the structural weaknesses of a non-agrarian economy. To resolve this drawback, the Proto Historic communities had the choice of either remaining in the peripheral areas and intensifying agricultural production or adjusting themselves to new ecological adaptations that entailed institutional transformations within the mobile cum sedentary economies. New ecological adaptations became imperative due to the dialectics of socio-economic change. On the one hand, the subsistence economies of the Proto Historic period were self-limiting by nature and on the other hand, the Proto Historic society itself was expanding and consequently becoming more complex in its interactions in the post 6th/5th Cent. B.C. period. A greater proliferation of Megalithic-BRW sites in the lower alluvial plains points to the growing emphasis of the significance associated with areas
of attraction' during the latter half of the Proto Historic period. The archaeology of the south east India shows that, the Iron Age culture had spread to the lower alluvial plains around the 6th/5th Cent. B.C. or even at a slightly earlier date.

It is difficult to point out one primary factor that gave rise to the elements of civilization in the lower alluvial plains. It may be suggested that a combination of factors was responsible for the actual material basis that provided the impetus to the subsequent demographic expansion and the consequent development of an agrarian economy, its allied socio-economic and political institutions in the post 5th-4th Cent. B.C., period. The high-water mark of these developments was achieved during the early Christian era in the Primary Region.

The evidence given below indicates that, at least by the beginning of the Early Historic period, there was an essential synthesis of the following structural developments viz. the natural selection of the lower plains as 'areas of attraction', greater sedentarization, demographic expansion, an emphasis on intensive agriculture and surplus production, the harnessing of organic and inorganic sources of energy i.e. draught animals and water, for agriculture, technological innovations associated with iron and hydraulic control, the evolution of 'chiefdoms' and social ranking, the beginnings of new forms of specialization and organization of labour, the development of new forms of exchange patterns, all, hitherto unknown during the Early Proto Historic period. I

I. The evolution of chiefdoms and the aspects following it will be discussed at length in Chapter III.
The choice of a new environmental zone, a switch over from dry to wet crops, the utilization of iron and hydraulic technology with greater efficiency and the potential for demographic expansion, provided the essentials to the late Proto Historic communities to single out the lower alluvial plains as 'areas of attraction'. The lower alluvial plains possessed certain physical advantages over the peripheral zones. Amongst these we may note: the composition of the river valleys with fertile soil and flat land and also the existence of an uninterrupted supply of water from the rivers which in turn provided a convenient avenue of transportation. Similarly, important raw material (considered as prestige items during the Proto and Early Historic periods), were associated with the lower valleys and the delta areas e.g. diamonds, garnets, chank, pearls, salt along the Coromandel coast (for the ecology of the lower plains vide Chap. I). The delta areas also formed convenient 'points of contact' for a coastal-hinterland exchange mechanism as well as for (traders/intermediaries linked to) the long distance trade network (touching the east coast of India) that became a prominent commercial and cultural avenue linking the primary and extended regions in the post 5th Cent. B.C. period.

Technological innovations in water control may be considered as a crucial pre-requisite that gave impetus to subsequent developments. As pointed out earlier, the mere clearance of the sub-tropical forest coverage in the lower alluvial plains was insufficient to transform these areas into 'nuclear areas'. Only when the flood plains were effectively harnessed did a greater colonization, settled agriculture and even an effective utilization
of more efficient agricultural implements of iron occur, which consequently saw the formation of the proto-urban society in the lower alluvial plains. This transformation may not have been simultaneous in all nuclear areas. In all probability the lower Krishna valley may have preceded the other nuclear areas, due to certain internal and external developments specific to that area (vide Chap. III). The typical marutam (agricultural) tracts of Tamilaham described in the Sangam texts (with all other elements associated with an urban culture) probably evolved in the post 3rd Cent. B.C. period.

The existence of a navigational channel in Phase I (Proto Historic BRW period) at Dhānyaakāṭaka is extremely significant (IAR 1962-63; I). The C-14 dates assigned to the Early Historic levels at this site are 405 B.C. and 325 B.C. (Agrawal et alusumgar 1966:446). Hence, the existence of this channel from the Proto Historic period and the manner in which the Megalithic-BRW sites are concentrated on the tributaries of the flood plain may indicate that, these communities were confident of their capacity to harness the lower plain as early as the 6th/5th Cent. B.C. Not only did they manage to link these sites by a 'grand water system' with each other and ultimately with the sea, but the existence of wharfs at such sites reflects this assured control over water courses (vide Ghosh et Sarkar 1964-65; for details, supra Chap. I).

Further south, in Macro Zone II, the Kaveri flood plain is another case in point. This area which was called pūmāl nāgu ('land of waters') during the Sangam period (PPTI. 587), had to be controlled for effective colonization and extensive cultivation,
because regular floods inundated the delta areas. Kaviri, literally means the river which 'enriches the garden' (PPTI. 267).

This may reflect subsistence farming based on plot cultivation, prior to extensive cultivation. The very concentration of Proto Historic sites west and east of the central delta i.e. Karur-Tiruchirapalli and coastal Tanjore respectively, indicates the probable inability of the early Proto Historic communities to completely harness the flood plain. It is possible that even before Karikalan's contribution in building the Grand Anicut, some form of simple water control may have been used for the lower Kaveri. Even during the pre-British period, every village had constructed a strong bank which on the one hand protected the village from the rapids, and on the other, if the water exceeded it, acted as a catchment for 'field lakes' from which water was drawn for cultivation (Ratnam 1966:32-33). The river was most effectively controlled (east) at Tiruchirapalli (the initial point of bifurcation), by diverting the flood waters to the Coleroon and preventing it from flowing to the main delta.

The attempt to harness the river was achieved with greater success during the time of Karikala who is said to have raised

I. Attention has been drawn to the accumulated layer of BRW 4 ft. below the Arretine ware and early Christian Brahmi bearing potsherds at Uraiyyur (IAR 1964-65:25-26; Nagaraja et Gururaja Rao 1970:226). At Tirukkampuliyur, over 1 ft. thick russet coated and painted BRW occurs at the lowest levels of the earliest BRW layer in Period I. The inception of the BRW is dated to the 3rd Cent. B.C. by Mahalingam (1970:15), though it is dated to 400 B.C. or slightly earlier by others (Gururaja Rao 1972:314-315). Though the Sangam texts do speak of extensive agricultural tracts in the present Tiruchirapalli area, it is significant that the Silappadikaram (Canto X) describes the existence of a dense forest belt outside the fortress wall of Uraiyyur.
bunds along either side of the river and installed other devices such as sluices and canals for the distribution of water (Silap. X. 108-III). (For details on the ecology and archaeology of the Kaveri flood plain vide Chap. I).  

In the extreme south, the early communities seem to have evolved some form of hydraulic control in relation to the topography associated with the Tambapanni valley, though it is not easy to determine the precise chronological context of these devices. In the upper and middle reaches of this 70 mile long river, seven ancient dams, small in size, stood obliquely to the river breaking the force of the flow channeling the water into canals (running parallel to the river) leading directly to areas of cultivation within the narrow alluvium, or into tanks (Krishnaswamy 1966:452-454). In the lower valley from Palamcotts, what is more apparent are the artificial embankments constructed along the river banks in order to control the biannual floods (Caldwell 1881:6; Spate et Learmonth 1972:772). There are two

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1. The Grand Anicut 'consisted of a solid mass of rough stone in clay, 1,050' in length 40'-60' in breadth and 15'-18' in depth, stretching across the outlet into the Coleroon in a serpentine form ... intended to distribute and reduce the pressure of water' (Krishnaswamy 1966:457).

2. The name KILLiva\lavan, often taken up by the early Côlas, seems to derive from kil - 'to dig' and va\lavan - 'fertility' (Sastri 1975:19).

3. 'The old irrigation under the Tamraparni was an example of intensive non-deltaic wet cultivation, in which advantage was taken of a retentive soil and tank storage. Like in the old days, the system still has a greater proportion of two crop lands to total cultivated area than any other old irrigation system' (Krishnaswamy 1966:454-455).

4. Malony notes that in the lower Tambapanni, 'small sections of many ancient bunds can be seen, rising up to twelve feet above the rice fields' (1976:12).
significant aspects associated with the latter feature. Firstly, the Megalithic-BRW sites in the Tambapanni have the highest concentration from Palamcottta to the sea. Rea had located at least 38 sites within a distance of 15 miles along the river banks (Rea 1902-03:III). Secondly, tank irrigation also becomes a more dominant feature precisely within the same area (ibid. map). Judging by the evidence at Vellur (Rea op. cit. III-II2) and also by the distribution of sites in a ribon-pattern along the narrow alluvium, the urn burial folk may have been more dependent upon river water than tank irrigation for agriculture.

The beginning of tank irrigation gave greater access to areas beyond the flood plains, particularly in regions having suitable soil for wet crops, but did not have sufficient water resources to make that soil productive. This was also another major technological innovation providing greater control over the environment for assured production and intensive pattern of land use. Though it is not known whether tank irrigation preceded dam irrigation across rivers or vice-versa, the basic principle involved is the same i.e., the dam as a catchment. However the evolution of two distinct methods suggests an understanding on the part of these communities to utilize the most efficient device that suited the regional requirements based on the terrain, soil and labour i.e., an ecological and technological compromise.

The primary tank country in south east India extends north and south of Tanjore, though the former area covers a wider region extending from South Arcot to Nellore (Spate et Learmonth 1972:737). Archaeologists have observed a striking coincidence between the distribution pattern of irrigation tanks and Megalithic-
RRW sites especially in the north east sector of Macro Zone II (Sirinivasan et Banerjee 1953:105; Banerjee et Soundara Rajan 1959:5). Though it is possible to infer that this area may have even been more extensively colonized prior to the lower delta of the Kaveri, this assumption requires greater substantiation based on more empirical evidence.

While the relatively high rainfall in the north east sector of Macro Zone II maintains some consistency of the water level in its reservoirs, the picture is very much different in the southern 'tank country'. Especially in eastern Madurai, Ramanathapuram and northern Tirunelveli districts, while the lower reaches of the Vaigai and Vaippar have a flow only during the rainy season (IIX I908:xvi. 387), the soil in this area is also more suitable for dry crops. The evolution of tank irrigation did not apparently bring in great changes to this area of relative isolation, primarily due to the extremely low rainfall count and the high rate of evaporation. The non-occurrence of Megalithic-RRW sites in this particular area and the concentration of sites in the upper reaches of the Vaigai, Vaippar and right along the perennial Tambapanni is a case in point and also a study in contrast with the 'tank country' north of Tanjore to ascertain the environmental basis affecting the agricultural ecology during the Proto and Early Historic periods.1

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1. The upper Vaigai and its tributaries which flow through the fertile but enclosed Kambam valley, had in the past inundated the lowlying areas (Kali. 67. 3-5, Part ii 16). The middle and the upper Vaigai have a heavy concentration of Proto Historic sites. The occurrence of the white painted RRW and the russet coated painted ware at some sites, may assign some of these sites to a relatively early period.
The most important aspect related to the embankments (of rivers or reservoirs) was the nature of hydraulic control regulating the movement of water. This aspect is important because hydraulic control itself is not only an indication of more efficient regulation and utilization of water, but it also carries vital socio-political implications related to more advanced institutional developments. The 'water lift' (which transferred water from a lake/tank/pond/well to agricultural plots in reed baskets attached to poles carrying a weight at one end that acted as a lever) was in vogue during the Sangam period i.e. the akalampi (Maduraik. 90-91). This mode of conveying water can be counted as one of the most primitive forms that dated to a very early period in antiquity and is yet dominantly present in Kerala and Tamilnadu. It is possible that some lever system was effectively used during the Proto Historic period, without which the stone slabs could not be placed with precision to construct a cist burial. Even forty men using wooden levers could not shift the capstone of a cist burial in Salem (Phillips 1873:223-8).

However, it is relatively clear that more efficient functioning of the late Proto Historic river embankments and small

1. Balakrishnan Nayar believes that the water lift diffused from the Indus valley to Mesopotamia, Egypt and South India (1977:195-197).

2. In Salem tottam (garden plots) are the lands irrigated by raising water either by hand or through the use of bullock (Nurton 1977:36). The songs of the modern horticulturists in Tamilnadu who use the water lift, pray to Subrahmanya (murukan/velan) and also to Ganesha. These groups also make vows to Valli promising her a silver sling to drive away birds who eat up the crops (*some Tamil folk songs* N. N. Sirinivas. JRN. Univ of Bombay. Vol. xii pts. i and iv, July 1943 and Jan. 1944, cited in Ghurye 1977:183-184).
reservoirs could not develop beyond a particular point without an additional technological innovation related to hydraulic control. To elaborate, the original (irrigation) embankments which conducted the flow of water through 'cuts' in the embankments, are insufficient, inefficient and ineffective to control an expanded volume of water. Greater efficiency and assurance in hydraulic control was achieved by using the sluice gates that regulated the flow of water. At Kaveripattinam, the occurrence of Rouletted ware (and a silver punch-marked coin) near an ancient sluice may provide it with an early Christian date (Maloney 1976:12). It is possible that the sluice gate may have come into prominence in Macro Zone II in the post 3rd/2nd Cent. N.C. period, a technological innovation that may have enabled Karikala to harness the Kaveri rapids with greater success. The Sangam texts clearly described the existence of reservoirs, sluice gates, sand embankments preventing river floods

1. Commenting on the 'cults' in the embankments that may have existed in association with the early irrigation works in Sri Lanka, Gunawardana states that 'these means ... were totally inadequate for the control of outflow of water from large reservoirs. And, in particular, it would have been a most dangerous practice to lead out water through "cuts" in the embankment since such a "cut" though filled up at the close of the dry season, could have constituted a weak point where the pressure of water during the height of the rainy season might easily provoke a breach in the embankment' (1978:61).

2. The C-14 date associated with the wharf at Kilaiyur (Kaveripattinam) is 316±103 B.C. (IAR 1965-66: C-14 dates IO; Ramachandran 1975:67), though in size the bricks from the platform here are the same as those at Nagarjunakonda (IAR 1962-63:13).

3. In Sri Lanka, the more sophisticated 'cistern sluice' controlling the intensity of pressure may have been designed around the early Christian era (Gunawardana op.cit. 72-3).
and canals in the marutam tracts especially those of the lower Kaveri and Vaigai plains (for a collected version vide Singaravelu I966:43-4; Pillay I975:195-I96). These developments however are more typical of the post 2nd-1st Cent. B.C. period and after. The transitory period from the Proto to the Early Historic period (5th/3rd Cent. B.C.) witnessed only the incipient beginnings of technological innovations, the consequences of which became apparent only in the early Christian era.

It is not known to what extent the Proto Historic communities of the earliest period were aware of the plough. What is clear to us is, even if they had any knowledge of it, there was no functional necessity, a pressing economic need or a suitable soil region to utilize the plough to increase production during that epoch. The extensive use of the hoe in the lower Tambapanni is a case in point. However, while the plough may have been introduced to the Primary Region from external areas, the transformation of the existing digging stick or the hoe into the plough is not a complicated innovation. The evolution of the hoe into the plough elsewhere in the ancient world has been relatively well documented (Basu I969:217-222).

Archaeological remains of a plough coulter came to light at Brahmagiri (Dhavalikar I968:137-138; Leshnik I971:489-90) and ploughshares from Janampet (Leshnik I969:498), Yeleshwaram (Khan I963:48, Pl. xiii, A-a) and at Nagarjunakonda in Megalith I.

I. Ethnographic studies show that the plough used by the backward tribes such as the Mundas, Oraon, Bhil etc. is made of a single piece of wood, which cannot plough deep (Vidyarthi et Rai I977:103). The plough of the Mullukurumbar which is called nemjal, is just a piece of iron attached to a wooden handle (Misra I971:27, plate facing p. 25).
II (Subrahmanyan 1975:168). It is also suggested that some iron implements at Adichchanallur, which look like hoes may be identified even as plough shares (Balakrishnan Nayar 1977:164, I47 Fig. 34 Nos. 5-6). However, the discovery of these archaeological remains of the plough mainly from the alluvial tracts is significant. Dry crops in the peripheral hills do not require ploughing. The Malaipadukadam (i22-I23), clearly states that mustard was sown on unploughed fields in the kuriichi tracts. The plough has been called nēṭil and the ploughshare er in the texts (Nadurai 173; Perumban 199).

The use of the plough can be due to many economic reasons: in the alluvial flood plains, the initial necessity of utilizing the plough (switch over from hoe cultivation) may have been more for the purpose of extensive cultivation rather than turning over the soil by deep ploughing. This extensive cultivation gave way to intensive agriculture most probably in the post 3rd/2nd Cent. B.C. period. Double or triple harvests per year (described in the Sangam texts) were possible only when hydraulic irrigation reached a level of greater efficiency in storage and distribution. This technological development was necessarily accompanied by the development of socio-political institutions and demographic expansion. Conversely, the areas beyond the flood plains where there was no moisture containing alluvial soil, the plough became a necessity to dig deep so as to make the soil productive, a task that could not be performed with a hoe if the crop involved was paddy. The anxiety of the farmer to quickly plough his land before the mud hardens has been documented in the texts (Kurun 131. 3-6).
The plough as a workable agricultural implement depended on two other vital accompanying factors. These were the (inorganic and organic) sources of energy and demography. Taking up the first aspect, we have already described the inorganic source of energy i.e. water, which in turn gave a fillip to plough agriculture in a broader geographical context, beyond the flood plains. Yet, the maximum utility of the plough as an efficient agricultural tool, was realized only when an organic source of energy i.e. draught animals, were harnessed to the plough for agricultural purposes. Yoking cattle to the ploughshare was not a difficult task. We have already pointed out to the probable utilization of cattle for heavy duty tasks during the Neolithic period, which probably continued into the Proto Historic period. I Caldwell is probably correct in suggesting that the term ār (plough) may have derived from erumai, the animal so constantly used for ploughing fields (1976:592). The ploughshare yoked to cattle accompanied by irrigated agriculture became the actual technological basis leading to the emergence of the agrarian economy that sustained the subsequent developments in the lower alluvial plains. It is, therefore, not surprising that quality bulls were selected for this task during the Sangam period where the draught animal became a part of the social wealth associated with the agrarian economy during the

I. It is relevant to inquire how large stone slabs were transported fair distances to construct megalithic burials. For instance, the nearest source for the two cist burials at Nagarjunakonda is at a distance about 25 k.m. from the site (Subrahmanyan 1975:206). Similarly, the granite capstone covering the urn burials at Porkalam, had to be obtained from a source nearly three quarters of a mile from the burial site (Leshnik 1974:78).
post 3rd/2nd Cent. B.C. period (Puroh 289:1-7; Pillay 1975: I94). Infact the term māṭu i.e. cow, also came to imply wealth by the early Christian era (Kural 400).

The second factor is related to demographic expansion. Excavations at habitation and burial sites in the eastern sector of the Primary Region indicate that the nuclear areas and their auxiliary regions witnessed the beginnings of demographic expansion in the post 4th/3rd Cent. B.C. period.

The recent excavations at Amaravati (Sarma 1975:60 ff.) and at Kesarapalli (Sarkar 1966) clearly indicate that habitation sites associated with sedentary communities had started even prior to the 3rd Cent. B.C. period. The following evidence may give credence to the idea about a population expansion in the lower Krishna in the post 3rd Cent. B.C. period; the Mauryas may have found this area sufficiently populated and economically important to maintain a provincial Governor (kumāra), probably at Dhānyakaḍaka (Ghosh 1979:No. 2; Seneviratne 1981:325); at least by the 2nd Cent. B.C., Dhānyakaḍaka had developed beyond a village settlement and had acquired the status of a market town or nigama (vide Chanda 1919-20:263, No. 5; Sivaramamurti 1977:275:No. 12; Ghosh 1979:No. 6), which also had a series of satellite settlements in the form of villages e.g. Nhapita

I. A pre-Christian inscription from Amaravati mentions a chief owner/caretaker of cattle or Mahāgovala (Sivaramamurti 1977:295 No. 91). A post Christian conch-shell inscription from Salihundam records its donation by a resident at govala (Subrahmanya 1964:121).

2. C-I4 dates for the Early Historic period at Dhānyakaḍaka provide 405 B.C. and 325 B.C. (Agrawal et Kusumb 1966:446), while Amaravati provides a date of 250 B.C. for the NBPM deposit (Agrawal et al. 1977:229).
gāma, Kudūra, Kalavira gāma (ibid. Nos. I, I4, 27; Sivaramamurti op.cit. 297 No. 99). These settlements can be associated with demographic expansion and the emergence of a series of habitation sites along the tributaries of the lower Krishna in the post 4th/3rd Cent. B.C. Some of these village settlements subsequently developed into market towns by the 1st Cent. B.C. e.g. Bhattiprolu (vide Buhler 1894). The existence of large Megalithic-ERW habitation sites e.g. Paddabankur, Kadambapur and Dhulikatta (IAR 1968-69:1-2; 1971-72:2-3; 1974-75:3-5) along the lower Godavari (Karimnagar district) and also the development of a fortification at Dhulikatta around the 3rd Cent. B.C. is significant (IAR 1975-76:2).

Further south in the Kaveri valley and in its auxiliary area same pattern is unmistakable. For instance, the cluster of sites surrounding the major habitation centres at Tirukkampuliyyur and Alagarai is a clear indication of the population expansion amongst a sedentary community (vide Mahalingam 1970:6, Fig. 2). In north east Tamilnadu, North of Tanjore district, excavations have revealed extensive burial sites especially in Chingleput and South Arcot e.g. Sanur. Sirimivasan and Banerjee mention the existence of nearly 200 megalithic sites in Chingleput district alone (1953:105). Habitation sites such as Kunnattur reveals a 0.6 mt. thick layer of ERW (IAR 1957-58:37-38), while Sengamedu has a 2.74 mt. thick ERW deposit (Banerjee 1956:32). At Paiyyam-palli (which is slightly inland), the Iron Age ERW layers show an actual expansion in area. The C-14 dates assigned to the Iron Age phases at this site range from 565 B.C., 315 B.C. to 290 B.C. Interestingly, the north east sector of Macro Zone II appears to
have a relatively late chronology as compared to most hinterland areas. The occurrence of large burial sites and the thick habitation deposits can be attributed to the relative intensity of population concentration rather than a lengthy period of occupation in these areas.

In the far south, though the picture is not too clear, in the Madurai district, archaeologists have observed that 'at every alternate village one could come across urh burials in large numbers' (Gururaja Rao 1972:80). This may reflect the relative intensity of population concentration from the latter phase of the Proto Historic period centred around Madurai in the middle Vaigai plains. Similarly, the intensive settlement pattern along the lower Tambapanni is significant. The existence of large burial sites, such as Adichchanallur (over 114 acres) may give us some idea about the population concentration. It is also relevant to pose the question, to what extent a demographic expansion in the narrow alluvial tracts resulted in population pressure that may have triggered off community movement across the Gulf of Mannar to north west Sri Lanka, where the Megalithic-BRW culture shares the same cultural matrix with South India (vide Seneviratne 1984).

It was these beginnings in demographic expansion that reached new heights during the early Christian era, which is so vividly described in association with the marum tracts in the Sangam texts. The synthesis of the above developments may be outlined in the following conceptual framework. On the one hand, while demographic expansion gave way to a greater emphasis on irrigated cultivation (over dry cultivation), it also witnessed a greater
use of the plough. On the other hand, while plough and irrigated
cultivation shortened the fallow period, the association of
draught animals in agriculture necessarily increased the output
per-man hour (Boserup 1965:33-4, 39, 41). The evidence from
the Primary Region also establishes that '... a concentration
of population, accompanied by the change to an intensive system
of cultivation, will take place only under the pressure of
increasing population' (ibid. 73 - our emphasis).

The empirical evidence clearly establishes that, it was
precisely these areas that began to develop an assured surplus
production capable of sustaining an expanded population. In the
lower Krishna it is quite clear that an agricultural surplus
may have been achieved relatively early, which attracted the
Mauryas, agents of long distance trade and sustained an expanding
population including a non-producing group associated with the
Buddhist establishment, perhaps as early as the 3rd Cent. B.C.
or even slightly earlier. It is evident that the habitation site
associated with Amaravati had the name Dhānyakaṇḍaka even before
it was recorded in the 2nd Cent. B.C. A possible translation of
the word kaṇḍaka means hill/mound, which in turn means the 'hill/
mound of grain' i.e. Dhānyakaṇḍaka. As the entry point to the
valley, Dhānyakaṇḍaka was a convenient place to store/accumulate
grain for redistribution (infra Chap. IV). It is also suggested
that Salihundam (north of Krishna, on the coast) derived its name
from Salikaṇḍaka (sali-rice) > salipataka (Subrahmaniam 1964:4).
Here too the accumulation of the surplus grain is implied.
Similarly, in the Kaveri valley, extensive remains of charred
paddy was obtained from the earliest BRW layers at Tirukampulliyur
The Sangam texts describe the habitation sites in the Kaveri valley such as Uraiyur and Allur, that were heaped up with paddy (Ahad 6.5; 46.14). The extensive remains of millet and paddy from the urn burials at Adichchanallur (Rea I915:5) shows that a surplus was achieved in both dry and wet crops in the lower Tambapanni at an early date.

This particular aspect i.e. a surplus in dry and wet crops, becomes significant if we link it to the earlier mentioned demographic expansion and the extension of agriculture to auxiliary areas. For instance, in the upper Vaigai, local traditions associate urn burials in the Perumalmalai area with granaries (Gururaja Rao I972:80). Commenting on the locational character and the contents of the burials in this area it is suggested that these were the '... works of an agricultural people ... they lived on the higher reaches cultivating the lower plains' (ibid. 85). They Āy chieftain in this area is said to have possessed large quantities of rice (Ahad 152.20).

The land slightly south of this had acquired the term nāñjīlnādu ('plough land') by the Sangam period which was again under the Āy chieftains (Puram I37-I40). Perhaps a good example to contrast agriculture (wet and dry), in a bio-climate more suitable for dry crops but with a potential for wet crops under

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1. Does the settlement Köṭṭūr in the Kōdai hills, i.e. Podaikanal (PPTI 337-8) mean the granary town or 'fortified town'? 
2. Keilasapathy draws out attention to two terms in the Parippatāl (Io. 85-86) as Valika polika | According to his interpretation, these were chanted on the banks of the Vaigai by people who dropped gold objects (of conches, crabs, prawns, fishes) in all probability to promote agricultural fertility (1966:98).
irrigation, may be seen in the description of the Parambunāḍu (of Vel Pāri) which was apparently located south of Madurai on the black cotton soil area of western Ramanathapuram (for identification of location vide Champakalakshmi 1975-76:121).

On the one hand, the texts describe the existence of reservoirs, paddy fields and nearly three hundred villages (Puram IO5, IO9-II0, II7-II8). On the other hand, it is stated that the hill tracts of Parambunāḍu had certain products viz. bamboo rice, valli, jack fruit and honey, which were not produced by the ploughman (Puram IO9. 3-8). It is also significant that, Pudukottai which has similar ecological conditions, yielded paddy and other grains from its burial urns (Gururaja Rao 1972:88). The discovery of rice from the megalithic context at Kunnattur in Chingleput (IAR 1957-58:37), at Kavalagunta in the Chittoor district (Newbold 1851:90) and also from a site in the Cuddappah district (Branfill 1881:97-IO0), may indicate areas within the 'tank country' that initiated paddy cultivation under plough and irrigated agriculture.

It was this surplus agricultural economy, which was basically different from the multi resource broad spectrum subsistence pattern of the semi tribal groups during the Proto Historic period, epitomizing the most fundamental aspect of social wealth during the early Christian era, and which was described by the

I. The site breakdown coinciding with paddy and millet growing areas from the three southern district is as follows:

<table>
<thead>
<tr>
<th>District</th>
<th>Paddy</th>
<th>Millet</th>
<th>Other pulses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tirunelveli</td>
<td>46</td>
<td>I4</td>
<td>I2</td>
</tr>
<tr>
<td>Madurai</td>
<td>24</td>
<td>24</td>
<td>-</td>
</tr>
<tr>
<td>Pudukottai</td>
<td>I9</td>
<td>I9</td>
<td>-</td>
</tr>
</tbody>
</table>

(EAMS 1962:22-23 Map:IO 'Agro-Climatic Region)
Sangam poets in the following manner: '... he will also grant you tracts of land supporting settlements surrounded by fertile lands abounding in water ...' (Porunar I7I-2): '... he granted me abundant grains of red paddy ... these heaps of paddy with hay, sown and harvested with the help of ploughing bulls ...' (Puram 390;20-23) (Tr. Kailasapathy 1968:20I).

II - i

The early socio-economic institutions in Macro Zone III (i.e. Sri Lanka) during the formative period did not show much variation as compared to those in south east India. For the convenience of our study the empirical evidence related to Macro Zone III is treated in a separate section. In this case too, the Megalithic-BRM culture was instrumental in providing the institutional matrix for the beginnings of civilization. In archaeological terms it marks a clear distinction between the Stone Age and the Iron Age. In technological and economic terms, it witnessed the transition from the stone using food gathering stage to the metal and pottery using food producing stage. In social terms, as opposed to the nomadic 'band' and tribal structure, the succeeding Iron Age established relatively sedentary communities with the extended kin groups residing in hamlets or village settlements.

The introduction of iron in the 6th Cent. B.C. did not, however, witness a rapid movement towards civilization in the subsequent period. The most positive traits indicating a new developmental epoch actually surfaced only in the post 3rd/2nd
Cent. B.C. and that, too, had an uneven development in time and space. The nuclear areas i.e. northern plains and south east Sri Lanka had a relatively faster development in institutional forms. The evidence shows that the Proto Historic subsistence economy had to give way to a more efficient agrarian economy in order to sustain an expanding population which had gradually evolved into the functionally stratified hydraulic society by the early Christian period. The post 3rd Cent. B.C. period also witnessed the incipient beginnings of urbanization, the initial building of monumental structures, the introduction of the Brahmi script, coins and the development of craft specialization and also the relative intensification of commerce. Such developments were best reflected in the crystalization of the early state in Sri Lanka over the multitude of 'chiefdoms' that preceded it.

The Sarasins noted (in the early 20th Cent.), the absence of an intervening Neolithic and Chalcolithic in Sri Lanka (Sarasin et Sarasin 1907). The stratigraphic excavations at Anuradhapura (S. Deraniyagala 1972b) at Kantarodai (Begley 1967) and Tissamaharama (Parker 1984) confirmed that the Mesolithic in Sri Lanka was directly succeeded by the iron using culture or the pre Iron Age and had no other metal or pottery using culture. Since we have enumerated the possible physical and cultural integration between the stone and iron using communities at least in northern Sri Lanka (supra Chap. I), a brief survey of the Mesolithic culture complex may give us some clues to the structural developments during the early Iron Age of Sri Lanka.

I. As for the empirical data on the Pre History of Sri Lanka we have largely depended upon the work done by S.U. Deraniyagala. He has evolved new strategies and theoretical perspectives for the application of a more scientific methodology to update
The Mesolithic culture of Sri Lanka, otherwise known as the 'Balangoda culture', appears to have spread over various physical and environmental zones with the exception of the northern peninsula and the lower Nahaweli basin of north east Sri Lanka. The primary artifacts of this culture consist of stone and bone implements. The high intensity of well-manufactured microliths and the primary use of quartz (chert to a lesser extent and jasper very rarely) are notable features associated with this culture complex. In the subcontinent the parallel technocultural elements are found in southern Tamilnadu (Aiyappan 1945; I45-I54; Zeuner et B. Allchin 1956; B. Allchin 1958;179-201).

The Mesolithic culture thrived on a multi-resource broad spectrum, hunting-gathering economy. A wide range of flesh-elephant to mollusc-formed the diet. Though fire was known, the scarcity of calcined bones and the high attrition shown in teeth indicate that, food was mostly consumed raw and this is borne out also by the relatively high content of sand associated with such food (S. Deraniyagala 1971:31-2; 1980:32). On the basis of archaeological evidence, S. Deraniyagala suggests the beginnings...
of a 'neolithic subsistence economy with mesolithic stone technology' (1980:201). This assumption is largely based on the following evidence. The discovery of an adze, hammers, anvil cum grinding stones (S. Deraniyagala 1971:30, 38); the discovery of grains of sorghum from the Mesolithic context at the Rawanaella caves in the hills of Bandarawela (P. Deraniyagala 1955:301) and grain that looks like domesticated millet (elusine coracana) or kurukkan from the Mesolithic levels at Belilena in Kitulgala (S. Deraniyagala 1980:201); the possible clearance of forests by fire for swidden cultivation and the consequent emergence of a Savanna (Sin. patan) environment in the wet highlands and intermediate uplands (Still 1925:397; Gaussen et al 1968:54; S. Deraniyagala 1980:185).

However, a reassessment of the same evidence may indicate that the idea about the 'Neolithic' period in Sri Lanka is questionable. The above mentioned adze was recovered from the surface at Kalukola-deniya cave near Kegalla (P. Deraniyagala 1953:131), which does not confirm its chrono-cultural context. The case of the grindingstone, as S. Deraniyagala himself suggests, may have also been used to grind pigments in addition to grain (1971:30). 'Red ochre is known to have been ground upon anvil-cum grindstones' (ibid. 88). He also goes on to say that the Mesolithic grinding stone 'had been used in cracking the tough outer shell of dikkekuna (canarium zeylanicum) the major indigenous edible nut in the island. This hypothesis receives support from the coincidence of distribution between anvil cum grinding stones and kekuna trees in Lanka, namely their restriction to the Wet Zone' (1981:151). Therefore, the grinding stone necessarily need not
have been evolved to *grind* grain.¹

The discovery of grain from caves associated with the Mesolithic culture also poses a series of questions. Let us take the case of millet and *meneri* found in the Beli-Lena at Kitulgala. The site itself is located in a tropical forest zone and in a hilly area which is not the most suitable ecology for dry crops based on swidden cultivation. It is indeed curious that the Mesolithic sites in the relatively more dry areas have so far not yielded evidence for the cultivation of domesticated varieties of dry crops. The particular layer which yielded these grain remains contained Mesolithic implements as well as beads and pottery that have their parallel forms in str. 3A (Megalithic-BRW context) of Anuradhapura. S. Deraniyagala however considers these to be 'intrusive through the action of burrowing animals' (1980:201).² We are of the opinion that such grain

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¹ The grinding stone at best may be called a 'pre adaptation' for early cultivation. Describing the ecology of domestication in the Near East Flannery observes the following: the gradual shift from the exploitation of a 'narrow spectrum' environmental resources to a 'broad spectrum' of edible wild products, everything from land snails to very small crabs and even cereal grasses was viewed as potential food. This was also accompanied by a number of 'pre adaptations' for early cultivation. One of this was the development of the ground stone technology viz. small coarse grinding stones, abraders, grooved rubbing stones, were first used for milling ochre. However, the ground stone technology was there, and when man eventually turned to the cereal grasses, he had only to adapt and expand a pre existing technology to deal with grain processing (1969:77-8).

² Eight charcoal samples obtained in association with 'millet' from Beli Lena during the 1978-79 excavation were given R.C. dates at the Birbal Sahni Institute of Palaeobotany (Lucknow) by Vishnu-Mitra. The upper most date is 8054 B.C. (BS-289; 10,010±160 YBP) and the lowermost is 10,284 B.C. (BS-293; 12,246±160 YBP). These samples have been despatched to Germany for reconfirmation (Pers. Comm. S. Deraniyagala I981).
was obtained by these stone using communities, from the iron using people in the neighbourhood or from the low lands through an exchange mechanism. The case may not have been different with the sorghum that reached the caves at Ravenaella in Bandarawela.

Finally, the burning down of the wet montane forests for swidden cultivation also involves certain implications. The occurrence of at least 25 Mesolithic sites in Horton plains has prompted S. Deraniyagala to accept the original hypothesis advanced by Still (1925:397; S. Deraniyagala 1980:184, Map. 2), though he does not rule out the possibility of 'firing of the forest for game drives' (ibid. 185). The problem involved here is one of wet forests, swidden cultivation and the stone technology. It appears that these particular areas had a much damper climate during the Mesolithic period (S. Deraniyagala 1971:39). It is extremely doubtful whether fire alone could have cleared the original forest fires (natural or man made) are more regular and effective in environmental zones having long dry seasons (Dimbleby 1977:3).

It is equally doubtful whether the existing tool technology was capable of clearing the original forest coverage. In this context the neolithic polished stone axe (in wooden haft) that aided the

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The search for 'domesticated' crops at times may tend to be deceptive where it does not reveal the realities of the existing subsistence economy. It has been pointed out that in South East Asia, rice which has some of the physiological characteristics of a marsh plant, first used by men in large swampy areas of grassy vegetation, and was 'gathered' rather than 'cultivated' (Mabbot 1977:4-5). Similarly, with reference to a different region (Middle East) and a different plant (wheat), it has been that the 'collection' of wild wheat sustained the nomadic Mesolithic groups prior to its 'cultivation' by the semi-sedentarized Neolithic cultures (Harlen et Zohary 1966:1075-80; Harlen 1967:197-201).
the Stone Age man to fell small trees (Dimbleby 1977:5 Fig. I-2; Pant 1979:II-I7) is conspicuous by its absence from the pre Iron Age lithifacts of Sri Lanka. Equally rare is the stone adze, the function was mainly to slice away the surface of the wood, thus its limited functional value in the task of clearing virgin tropical forests. Another interesting point which S. Deraniyagala himself notes is the clear absence of pitted pebbles and the anvil cum grindstones from this area (1971:38). If swidden cultivation had been conducted at this intensive scale (where it transformed a whole series of natural vegetation), some amount of implements associated with this aspect of the subsistence economy should have come to light in this area. Some are of the opinion that these eastern hills, traditionally known as the Ūva division, by virtue of its location between two nuclear zones became a refuge area where swidden cultivation which led to forest clearance and the subsequent creation of a grassland environment was initiated from the early Iron Age (Holmes 195I:54-57). I On the basis of the above evidence, it is difficult to establish that swidden cultivation and subsistence farming existed in this island prior to the Iron Age. Until more positive evidence is available, we may only concede that the stone using communities, in all probability, began subsistence after it was introduced by the iron using people to this island or have alternatively gathered certain wild varieties of grain.

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I. It has been pointed out that the present Mahavālī river (Mahavālukā nadi) was originally known as Mahākandarā nadi. The present name seems to occur from the Early Medieval period. The erosion in the Ūva area may have caused this great flow of soil along this river (Holmes op.cit. 57).
In addition to hunting, fishing and gathering also formed a vital sector of the subsistence economy. In one of his last papers, P. Deraniyagala calls the Balangoda man a 'hunter-fisherman-gatherer' (1979:50). Remains of fish bone, crab, marine shell from Mesolithic sites and also zoofacts used for fishing have been obtained (S. Deraniyagala 1971). Sites yielding lithifacts belonging to the Mesolithic culture have been found along coastal Sri Lanka near lagoons (Solheim et Deraniyagala 1971:9-40; S. Deraniyagala 1980:186 Map 3, I89) and are associated with a littoral-marine ecology. The presence of the remains of dik-kekuna (canarium zeylanicum) and anvil-cum-grind stone associated with it at Mesolithic sites (S. Deraniyagala 1981:151) indicate that this was a favourite nut that was gathered.

While other varieties of roots, yams and tubers were also gathered by the Mesolithic people, it appears that the lengths of antlers and of bones were used as digging tools (P. Deraniyagala 1979:52).

Another important aspect of the Mesolithic economy relevant to us is the production and the exchange network that existed during the pre Iron Age. The basic 'craft' of the Mesolithic

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1. To this day, groups of Veddas who live around Batticaloa exploit marine resources in addition to hunting.

2. Another variety of this species is kekuna which is not an edible nut but the dried core of which is extremely useful to obtain oil for lighting purposes. The 1978-79 Belilena excavation at Kitulgala yielded burnt kekuna seeds from the Mesolithic layers (S. Deraniyagala Pers. Com. I981).

3. In addition to flesh, the Vedda diet consists of root, yams, fruits and honey. Yams are usually dug up by women (vide Selignamm 19II).
culture centred on the stone industry. These lithifacts are primarily fashioned out of quartz and to a lesser extent out of chert, quartzite, crystallines, conundum and jasper (S. Deraniyagala 1971:25; 1971a:51). The technique apparently used was the soft hammer as well as pressure flaking methods where 'flaking appears to have been executed by indirect percussion' (ibid. 52). The quality of production also seems to have improved with time. Stratified layers from cave sites reveal that the microliths in the upper layers not only possess a greater variety but are also much smaller and are better produced than the ones in the lower layers (P. Deraniyagala 1939:361-2; S. Deraniyagala 1971:28; 1971a). Raw material for the production of lithifacts at factory sites was conveniently obtained from the outcrops in the neighbourhood (B. Allchin 1966:131; S. Deraniyagala 1971a:52; Deraniyagala et Kennedy 1972:36; S. Deraniyagala 1972a:64).

Some of the Mesolithic sites have yielded an extremely poor, hand made pottery having a coarse paste and a very limited range viz. gourd shape, dish with vertical body and convex lower body as the two dominant forms (S. Deraniyagala 1971:31). These carry beater impressions on the exterior, poorly fired in an open hearth or sometimes sun baked. It has been suggested that the slender finger prints found on pots indicate their makers as women (ibid.).

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1. Large patches of charcoal found in association with lithifacts and waste material may indicate the existence of the 'Andamanese' method where the quartz was heated up (in nodular form) and then shattering them with blows (B. Allchin 1966:131).

2. The Veddas make very rough pots. These are hand made and are placed on the fire and covered with pieces of dried wood. Both men and women make pots (Seligmann 1911). For the system of Vedda potting (vide P. Deraniyagala 1979:62, Appendix - IV).
P. Deraniyagala often called this poorly manufactured pottery associated with lithifacts the 'neolithic ware' of the island (1940:362), though he has not made its stratified context very clear apart from stating that they were found from the upper levels of the Mesolithic sites. The stratified layers at Bellan Bandi Pallessa clearly show that where existed there was a non-pottery culture (Deraniyagala et Kennedy 1972:18-19). In all probability the idea of pottery for culinary purposes must have been transmitted to the stone using people by the early Iron Age communities.

The location of Mesolithic sites in coastal areas, hinterland Dry Zone plains and the monsoon hill forests also implies the exploitation of various resources in different ecological zones by the Stone Age people. The very structure of the economy based on a hunting-gathering subsistence pattern necessitated regular movements by these communities, perhaps on traditional routes. In this context S. Deraniyagala draws out attention to two important observations made by Still 'about the interaction between man and his micro-environment' (1980:164), which may be considered as a useful point to envisage the pattern of movement during the Pre-Historic period.

I. Stone hearths (made in the form of a small cist) have been found in association with ash from these sites though their stratified context is not too clear (S. Deraniyagala 1971:31). Six stone hearths associated with a 1 ft. thick layer of charcoal mixed with animal bones were revealed below the surface during the 1978-79 excavation at Beli lena, Kitulgala (S.Deraniyagala Pers. Com. 1981). Hearths were obviously meant to keep pots for cooking purposes. However, food habits of the Mesolithic people more often show traits of having consumed their food raw. The use of hearths and pots in all probability may coincide with the early Iron Age and after.
Still pointed out that in the wet uplands, which are almost impossible to penetrate, the Pre Historic people who operated with a limited technology, may have conveniently used the paths cleared due to the regular movements of elephants. The coincidence of mesolithic tools with such 'elephant paths' is significant (Still 1925:398-9). In the Dry Zone he observed that waterholes, which were convenient traps for game especially during the dry season, coincide with sites yielding quartz implements (ibid 400). Such water holes (Sin. Vil; Tamil Villu) are a dominant feature in the landscape of north and south east Sri Lanka. These are still associated with the periodic movements of the Veddas as a feature related to annual seasons and may have also been associated with regular routes.

A regular network of routes therefore seems to have criss-crossed the ecological zones in the hills and in the plains. It has also been suggested that unlike in the extremely dry climatic sections in Australia and Southern Africa where Stone Age people covered long distances in search of food, 'the equatorial climate of Ceylon on the other hand provides more stable conditions on which a family can maintain themselves throughout the year in a much smaller area ...' (B. Allchin 1966:129). This meant that

I. The areas of movement of the Veddas in the highland coincide with areas having stone implements of the mesolithic period (Seligmann 19II).

2. The forest Vedda forms a home two or three times a year as the season demands. Thus when the dry hot months arrive rivers and brooks dry up and game collects in the low forests around half dried river beds, he then moves close to a place where water can be got (ibid.).

3. 'Stable conditions' was not always the case during the Mesolithic period. The Kabaragalge in Ratnapura for instance
the cycle of movement was relatively small or restricted. Then the ecological and 'territorial' boundaries may also have coincided to a large extent, and consequently the 'territory' associated with the band/clan or the tribe may have been small.\(^1\)

Considering the above aspect it is evident that Mesolithic groups operating in one ecological zone may have established an exchange network with another ecological zone where community interaction was conducted via the band/clan or tribal sector. River banks, perhaps, provided the most convenient routes as they linked the ecological zones associated with the littoral, Dry Zone plains and the forest uplands. There is archaeological evidence for such inter eco-zone exchange. The Beli-lena in Kitulgala is situated on the western lower hills and is located on the banks of the upper Kelani river which flows to the sea near Colombo. The 1978-79 excavation yielded from the lowermost mesolithic layer a lagoon shell (*potamides cingulatus*), which is normally associated with the north west and south east coastal salt (S. Deraniyagala 1981:152). Similarly, Rawana-ella yielded perforated sea shells where as Bellan Bandi Pellessa revealed courie shells (S. Deraniyagala 1971:38).\(^2\) These two sites are

Cont'd ... f.n. from pg.,157 yielded much vertebrate remains from the lower occupational levels. The upper levels show a marked increase in the snail remains, which may indicate a reduction in the animal population (S. Deraniyagala 1971:32).

I. It is interesting to note that the Vedda tribal names are territorial (Selignamm 19II).

2. It is difficult to ascertain the actual function of the perforated shells from Rawana-ella and other such sites. They were either 'prestige' items, or those used purely for the purpose of ornamentation, or even as planes to smoothen the surface of wooden implements (B. Allchin 1966:Pl. XA.).
again in the lower hills of south east Sri Lanka and are linked by river courses to the coastal area. As we shall see later it was precisely such river routes that linked the early Iron Age sites in the plains with the raw material producing hills and the relatively backward communities in such areas. S. Deraniyagala has also brought in some evidence to show the existence of an exchange network in the hinterland areas. He has convincingly shown that the acavus shell has travelled out of its natural habitat i.e. the Wet zone. These shells are found in the Wilgala cave in the intermediate Dry zone (Monaragala Dist, Eastern Province), from Bellan Bandita 'at the eco zone between Wet and Dry zones' and even from (cave I8) at Sigiriya which is in the Dry Zone (S. Deraniyagala 1981:152; Deraniyagala et Kennedy 1972:43). A single collection made by Hartley from four small hills (factory sites) at Bandarawela was a staggering 4765 quartz tools (I913; I914) which were probably used for exchange purposes. Similarly Anuradhapura Gedige Str. I which represents a mesolithic habitation cum factory site, had to obtain quartz from distant places (S. Deraniyagala I972b:64). An interesting question concerns the sort of exchange network in which these implements circulated to areas or to groups requiring these tools. The existence of a dual exchange network i.e. between ecological zones and within ecological zones, may have facilitated the fairly long distances travelled by particular items.

It is difficult for us to positively outline the nature of the mesolithic society. Judging by the nature of the habitat, especially the cave sites, we may suggest that they were nomadic bands (consisting of the extended family or the clan) who led a
communal life within the hunting-gathering economy, a situation that may be compared to the Vedda society. Mesolithic burials often contain pairs of male and female skeletons (S. Deraniyagala 1971:32), which may indicate the close kinship structure in this society based on the nuclear family. Apparently, camp sites were visited and inhabited even after the burials (ibid.), which is a clear indication of the regular routes followed by the band consisting of the nuclear or extended family.

The ensuing study indicates that though subsistence agriculture, pastoralism, the iron and ceramic technology were introduced to this island around 6th Cent. B.C., the hunting-gathering economy and other economic interactions of the Mesolithic existed side by side with the new production techniques and prevailed well into the Early Historic period, too.

II - ii

It is quite evident that when the Iron Age culture arrived in Sri Lanka, the Mesolithic communities had not only spread over a

1. Veddas live in communal caves. Food is frequently cooked by one woman and shared by all the members of the community. No food was private property and even bows and arrows were put together in a particular place. Hunting is essentially the job of the male, though he at times dug for yams. The latter is usually the work of women, with the help of the children. The Veddas are monogamous and women are not treated unequally. A matrilineal structure apparently seems to prevail amongst them. Veddas normally carry as personal property bows and arrows, axes, digging sticks, a drill for producing fire, an earthenware pot (Selignamm 1911); Leach 1963:68-78).

2. The Veddas still follow an embalming system of imersing corpses in bees honey (P. Deraniyagala 1979:62).
relatively broad physical area but had also developed some semblance of a socio-economic structure. Within this context, if we are able to ascertain the earliest process of acculturation, it may give us greater insight into the character of institutional development during the Proto and Early Historic periods.

There are at least two major views on the authorship of introducing the elements of civilization to Sri Lanka. The first of these is the traditional as well as the popular one crediting the north Indian Indo-Aryan speakers as the carriers of civilization. This view is largely based on the narrations recorded in the Pali chronicles, the early Brahmi inscriptions and on certain linguistic and cultural characteristics that have evolved since the Early Historic period (vide Paranavitana 1959:82-96). According to the second view, elements of civilization emanated from south India to Sri Lanka via the Megalithic-BRW culture (Senaratne 1969:7-19; 1969a; Goonatilaka 1981:157-174). An interaction between these two cultural streams is pointed out by S. Deraniyagala, who suggests that '... it seems likely that although the first Aryan settlers in Ceylon adopted the artefact assemblage which was essentially megalithic, they did not absorb their burial practices to any significant extent' (I972b:159-160). In our opinion the last mentioned view is an attempt to strike a compromise between the original dogma associated with the 'ynar' colonization and the new evidence for the presence of the Megalithic-BRW culture elements prior to this 'colonization' (vide Seneviratne 1984).

There are several vital aspects which all these three views tend to overlook or avoid. The first is the necessity to understand
the dynamics of the migratory pattern of community movement within a chrono-cultural and a geographical context, that also has to be viewed in terms of the processes of acculturation or cultural interactions. For this purpose we have already outlined the necessary framework in Chapter I.

The introduction of the 'Iron-Age' to Sri Lanka has to be viewed more as a transmission of 'culture elements' through periodic contacts established by various groups where they physically and culturally intermingled with each other as well as with the existing Mesolithic people in such areas, in the course of which the latter came to adapt the higher culture elements of the iron using people. In this context we have to recognize the fact that by the beginning of the Early Historic period around 3rd Cent. B.C., there was a co-existence of various cultural nuclei in different physical areas of the island. Covering the broadest physical area was the Mesolithic element which was also the substratum culture of the island. Then there was the cultural locus that developed primarily in northern Sri Lanka which appears to have had its impetus largely from South India. Another cultural locus developed in south east Sri Lanka which may slightly post date the northern locus, but had conclusively emerged as an independent geo-cultural unit at least by the 3rd Cent. B.C. and seems to have had a stronger Indo-Aryan culture element in it. Similarly, the importance and the significance of the Nagas (mentioned in literature) who were concentrated along the northern and the western coast cannot be overlooked in the early social and economic formations of the island and also as agents of a more cosmopolitan culture associated with long
distance trade.

The synthesis of all these above mentioned cultural elements and an interaction of the cultural areas of the island, may have been responsible for the relatively rapid spread of civilization and the emergence of certain uniform cultural patterns by c. 3rd Cent. B.C. This, consequently, resulted in the development of an institutionally advanced society in Sri Lanka at least by the 1st Cent. B.C. In terms of historical phases, at least in northern Sri Lanka the Megalithic-MRW culture appears to have formed the earliest synthesis with the existing Mesolithic culture in evolving a relatively better developed social matrix. This matrix provided a convenient format that could incorporate new and more dynamic cultural elements nourished by the cosmopolitan urban civilization of north India and the Deccan. It was precisely the memories of this community and cultural integration synthesised with the legends associated with Rakṣasas, Nāgas, Pulindas, the 'visits' of the Buddha, the Vijaya-Kuveni as well as the Panduca-bhaya episodes and so on, that came to be documented in the Dipavamsa and the Mahāvamsa. These legends were conveniently 'resynthesising' and 'reformulating' in favour of the dominant ideology of the Great Tradition to suit the new requirements of the island society during the historical epoch that gradually evolved in the post 3rd-4th Cent. A.D.

II - iii

Archaeological evidence may possibly indicate that the earliest Iron Age communities in north-west Sri Lanka adapted them-
selves to the marine-littoral ecology where a multi-resource broad spectrum subsistence economy prevailed. Though the literary texts describe the earliest settlements as those belonging to fully sedentarized agrarian communities, the ensuing discussion may question the validity of some of these traditional assumptions.

The Megalithic-MRN habitation and burial sites in northern Sri Lanka clearly show a coastal group and a hinterland group. The river estuary and the littoral location of the former groups is very obvious, which also indicates an entirely different ecology from the hinterland. This distribution pattern has to be viewed in relation to the ecological adaptations of the earliest iron using groups in north west Sri Lanka and also the proximity of location of this particular ecological zone to the southern coast of Tamilnadu. Within this context marine resources may have played a crucial role in linking the north west coast of Sri Lanka to the opposite coast in south India.

The Mesolithic techno-cultural complex common to Sri Lanka and southern Tamilnadu, clearly indicates the existence of contact between these two physical areas extending to a remote period in antiquity (Aiyappan 1945:145-154; Zeuner et Allchin 1959:4-20). With the arrival of the iron using groups to the lower Tambapanni valley and their success in gaining direct access to the marine resources (viz. fish, pearl oyster, chank, coral) in the Gulf of Mannar, it led to a greater interaction between the two coastal areas gradually resulting in community movement to north west Sri Lanka.

We are unaware whether the Mesolithic culture in the above
areas had already developed any seafaring methods. It is, however, possible that the earliest Iron Age people in all probability used a primitive craft such as the catamaran (Tamil: kattumaram/Telegu and Sinhalese: teppam) for seafaring purposes along the coastal areas. I In fact at places such as the Pamban pass which is navigable only by small vessels due to its rocky barrier, the catamaran serves an extremely practical purpose (WCIP I96I: III). By utilizing such primitive crafts, it is quite likely that the early iron using groups may have reached north west Sri Lanka from south India. When the sea remains calm on a clear day, it takes only a few hours for a catamaran to cross the Palk Strait between the two coasts. 

Evidence is still insufficient to indicate a demographic expansion in the lower Tambapanni valley resulting in a 'spill-over' to north west Sri Lanka, where communities moved across the Palk Strait and the Gulf of Mannar in search of fresh pastures.

I. This primitive craft is very simply constructed by lashing together 4-5 logs in the form of a raft. It is cheap, unsinkable and is extremely convenient for small scale fishing operations even under conditions of strong wind and heavy surf. This craft is popularly used in lagoons, deltaic channels and along the shallow coasts extending from southern Orissa to northern Sri Lanka, which significantly coincides with an area having the Dravidian group of languages. Relatively deep seafishing and fairly long distant travelling is undertaken by the Negapatam seven log type (the largest type of catamaran). It is interesting to note that until recent times, these Negapatam type crafts were used between the Kaveri delta and Sri Lanka to obtain Melia wood for making catamarans. Periplus records the existence of such vessels (made of single logs bound together) along the coast of Damirica (Schoff I972:46; for details on catamarans vide Hornell I920:140, I52-5; Raghavan I96I:1I6-II7; WCIP I96I:III, I20-2; MT I962:iv, 86-88; Sopher I965:5-I9).

2. 'It stands to reason that a country which is only thirty miles from India, ... would have been seen by the Indian fishermen every morning as they sailed out to catch their fish ...' (Pieris I9I9:65).
Ecologically north west Sri Lanka is similar to Tirunelveli or Ramnad districts in Tamilnadu. A larger area of the littoral-marine ecological zone associated with north west Sri Lanka does not encourage total sedentarization and is better suited for semi-sedentarized communities operating within a broad spectrum subsistence economy. It is more likely that the process of exploiting marine resources, which consequently entailed periodic visits to north west Sri Lanka, may have provided the impetus for the beginning of a series of habitation nuclei along the north western lowland areas. We do not, however, postulate a planned mass migration into Sri Lanka. Considering the very nature of the marine resources i.e. their quantitative occurrence and the frequency of exploitation, it may have initially led to irregular and periodic visits which were seasonal in character and may have also determined the frequency of the contacts with the Mesolithic people.

The locational character of the Megalithic-BRW sites along the north west coast may provide us with some clues as to the relationship between these early sites and marine resources. According to Hornell 'one of the most productive chank fisheries in the world exists in the shallow seas in the neighbourhood of Jaffna' (I914:28). A quality variety of chank which is known as novakhd patti is found between Karativu island and Jaffna peninsula around the island of Delft and immediately north of the island of Mannar (ibid. 88; Macready I89I:8). These are valued due to the good working size, thickness and good colour. The best and the largest shells, however, are found around Punkudutivu, Wainativu and Mannar islands and also from Mulativu and Trincomalee
in the northeast coast (Twynam 1902:36; Hornell op.cit. 39).
The large byccinum is in fact found in the north extremity of
Kalpitiya peninsula and Kudiramalai headland (Macready op.cit.2).
In addition to this, sub-fossil chank industry is carried on in
the Jaffna lagoon and in the shallow straits between the island
of Velanai and Punkudutivu (Hornell op.cit. 40). Similarly
the primary pearl banks of Sri Lanka are situated off Pulam which
extend north towards Mannar (H.J. Lebeck, 1797, 'An account of
the pearl fisheries in the Gulf of Mannar' cited in Steuart
1843:Appendix p. 93). 2

If we compare the above resource bearing areas with the
north western Megalithic-BRW sites of Sri Lanka we get the
following picture. In the extreme north three Megalithic
burial sites and a series of BRW sites in the Jaffna peninsula
coincide with the primary chank producing locus. Thousands of
cores of worked chank have been unearthed from the Western
Peninsula in Jaffna and at Kantarodai (Pieris 1917:28; ASAdR
1965-66:85, 86 No. 13). The sub-fossil chank producing areas
west of Jaffna peninsula and also within the Jaffna lagoon is

I. In this report Twynam in fact strongly recommends the location
of the headquarters for chank fisheries in this area at Marich-
chukkaddi (the estuary of Madaragam Aru) where the 'approach to
it from the sea is clear of rocks and reefs. Vessels can come
close in and find shelter in the little bay under Kudiramalai'
(1902:22). It has also been observed that the Kalpitiya penin-
sula can provide good anchorage for vessels of a draught not
exceeding 14 ft. Small vessels with knowledge can obtain
anchorage, sheltered from south-westerly winds in Dutch-Bay.
Portugal Bay affords anchorage to small vessels from south-
westerly winds in depths of 3 fathoms (5 m.). Vessels of a
draught not exceeding 14 ft. (4 mt.) can obtain good anchorage
about 2 miles westward of Kudiramalai in charted depths from
3½ to 3⅔ fathoms (MCIP 1961:122).

2. Chilaw and Karaitivu became the main centres of pearl fishing
in the 16th Cent. A.D. during the Portuguese hegemony over
the western coast of Sri Lanka (de Silva 1978:15).
in the vicinity of these sites. It is believed that even until the late medieval period, Jaffna was an island (Vitharana I966: I40-I). If so, a sea route traversing the shallow waters between Anaikottai and Karainagar (where there are burial sites) may have cut across the Jaffna lagoon to reach Mulativu and Trincomalee, which are the major chank fishing centres in the northeastern coast. While the Kadiraveli burial site is situated slightly south of Trincomalee, it is reported that an urn burial is located at Puduwakkatu near Tiriyay. Investigations have also revealed the existence of a port site during the early historic period at Mulativu.

Shifting to the northwest coast, the existence of a chank factory site is reported from Mantai (Boake I887:III; Carswell et Prickett I984:49). South of Mannar, Pookulam a point at the estuary of the Modaragam aru, clearly shows pearl oyster mixed with BRW from stratified layers embedded in coast ridges (Senevatatne I984:245). About 10 miles east of Pookulam on the left bank of the Modaragam aru is the urn burial site at Tekkam. Slightly south of the estuary of Modaragam aru, there is the BRW habitation cum chank factory site at Kollankanatta which is located on the coast. Further south, opposite the north end of the Kalpitiya peninsula the vast urn burial site at

I. Boake encountered the chank factory at a depth of 4 ft. 5 ins. in association with fragments of chattis and bone (Boake I887: III).

2. An ancient habitation site existed around Occappukallu (which is along the Modaragam aru in the immediate hinterland of Marichchukkadi). This may be substantiated by the occurrence of pre-Christian Brahmi inscriptions (Paranavitana I970 Nos. I00-I14) and other archaeological remains (Parker I909:247; Brohier I935:27).
Pomparippu is located '... about six-and-a-half km. from the western coast, at a conveniently navigable point and therefore easily approachable from the sea' (Begley 1981:56).

The seasonal character of such group movements may have initially been determined by the quantitative occurrence of marine resources and the frequency or intensity of the exploitation of such resources.

It has been observed that the occurrence of piral (the sand mixed with mud that supports a profuse polychaet fauna living in arenaceous tubes which are consumed by the chank) has a greater density along the south eastern coast of Tamilnadu than the northwestern coast of Sri Lanka (Hornell 1914:28). This naturally intensifies the occurrence of chank more along the southeastern coast of Tamilnadu. Therefore an extra effort was required only to obtain high quality chank, for which periodic visits may have been conducted to the northern islands and the northwestern coast of Sri Lanka.

Similarly, both, in Tamilnadu and in Sri Lanka pearl fishing is not a regular feature. Pearl fisheries are seasonal. This is because the development of the oyster depends upon relatively stable marine ecological conditions. The Gulf of Mannar and coastal Tamilnadu are noted for unstable oceanic conditions and land oscillation from time immemorial (P. Deraniyagala 1955-56: I27-I28; Malony 1968:289-294). The uncertain character of pearl fisheries appears to have persisted to the modern period.

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I. The periodicity of the influx of Antarctic water into the seas off Sri Lanka has been shown as 'the periodic sudden mass mortality of marine animals such as the pearl oyster and the advent of southern marine animals off Ceylon ...' (P. Deraniyagala 1979:46).
For instance, within a period of 112 years (1801-1913), as against 113 chank fisheries, there were only 13 pearl seasons (Hornell 1914:21).

Ethnographic notes also indicate the temporary character of such chank or pearl fishing camps. These were seasonal camps that lasted only a few months, where people coming from various directions gathered for pearl or chank diving and also conducted exchange and other economic transactions and finally dispersed leaving such sites desolated at the end of the season (Steuart 1843:93).

Two important aspects related to the above process are as follows: In the course of their periodic visits, the iron using people may have managed to establish some form of 'contact' with the Mesolithic people; certain sections of the Mesolithic groups apparently attempted at adopting the technology and also the culture elements of the intrusive groups and as a consequence a physical integration cannot be ruled out. To substantiate the above assumption we may recount the following evidence.

Firstly, on the basis of an analysis of the skeletal remains at Pomparippu (1970 excavation), important inferences have been drawn from the point of physical anthropology by Lukacs and Kennedy (1981:106-7). The first of these is 'the Iron Age people of Pomparippu possessed some biological features which may indicate to us their probable affinities to neighbouring populations'. The second is 'the existence of some level of biological affinity

I. The ancient caste occupation of the Kadiyars of Mantotte (Mannar) is collecting chank shells and chaaya roots, which gives a purple dye (Casie Chitty 1934:153).
between the Late Stone Age people of Bellanbandi Palassa and the Iron Age people under consideration ... especially noted with respect to genetically determined morphological traits'. A third is 'Pomperippu teeth are more nearly similar to the Vedda dental patterns' (ibid.1106-7). In another study Kennedy has been able to establish that of all the tribal people in the island, the Veddas possess the closest biological similarities to the skeletal remains found within the Mesolithic Balangoda culture phase in Sri Lanka (Kennedy 1965:202). Finally, Lukacs and Kennedy also comment upon the fact that 'there is no evidence of new and strikingly different anatomical traits into coastal regions of Sri Lanka' (Lukacs et Kennedy op. cit.).

Secondly, the 1970 excavation for the first time yielded positive evidence for contact between the Iron Age and the Mesolithic communities, viz. a chert flake from burial A, a chert blade fragment in burial C, a microlith in burial H, and a quartz flake tool in burial L were found (Begley 1981:69, 71, 75). While these implements were recovered from the actual burials, three other stone flakes were found from the bottom of a pit in which burial urns were placed (ibid. 83). The excavator also recalls that similar stone tools and flakes were found from the Iron Age levels at Kantarodai (ibid.). Similarly during the Anuradhapura excavation, the excavator does not rule out the fact that 'the Mesolithic phase persisted up to and overlapped with the advent of historic man in Ceylon' (S. Deraniyagala 1972b:64). I

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I. Surface collections from the north east and the eastern coast of Sri Lanka establish an association between Mesolithic tools and Early Historic BRW (Solheim et Deraniyagala 1972). Lithifacts were found with Early Historic pottery and iron slag, at
It is within this context that the discovery of faunal remains from actual burials become important to our study (ASAnR 1957: I6; Begley 1981:71-72). The most significant of these is the recovery of a monkey mandible along with human skeletal remains in the same urn which yielded a quartz flake tool in burial 1 at Pomparippu (ibid. 75).

Even the relative technological backwardness evident from the archaeological remains at Pomparippu is quite clear. To quote an example we may take the case of ceramics. While the shapes and forms of the Pomparippu pottery certainly adhere to the south Indian megalithic ware the qualitative level of production cannot be compared with the well manufactured sophisticated and the wide range of ceramics at Adichchanallur. Similarly, the striking paucity of iron tools from the burials and the Proto Historic levels is entirely in contrast to the situation at Adichchanallur. The overall technological backwardness of the early Iron Age in Sri Lanka viz. a vis its south Indian counterpart and the subsequent Early Historic culture in Sri Lanka, may have been due to the initial non familiarity of production techniques by the autochthonous stone using groups who adopted the new techno-cultural elements of the intrusive iron-using Megalithic BRW culture.

Cont'd ... f.n. from p/71 Seruwila which is slightly north of Kadiraveli (ibid. I9-21). Similar finds were found in the same area at Ilankaturai, an ancient port site again not too far from Kadiraveli (ibid. 21-27), and also at Kudumbigala in the eastern coast (ibid. 31). However, stratigraphic evidence from south east Sri Lanka show a cultural demarcation between the Mesolithic and the Proto/Early Historic ware (S. Deraniyagala 1981:150-151, Fig. 8, 10).
In the initial phase not only could these communities have been largely semi sedentarized groups, but apparently they operated a multi resource broad spectrum subsistence pattern supplemented by pastoralism and subsistence agriculture within a marine-littoral ecology. Let us consider this in greater detail.

In Chapter I we have elaborated the environmental conditions of north west Sri Lanka. This area has been classified under the Hot Arid Lowland tropical bio-climatic region, where there is an annual rainfall of 25-50 inos, and consisting primarily of chemically unfertile Lathosol soil region. We have also pointed out that all Megalithic-BRW sites in this area are situated within a particular micro ecological zones. For instance Pomparippu, Karambam kulam and Tekkam are located in areas having very narrow strips of alluvium tracts associated with river courses. Similarly, Kantarodai is situated on the Calsic Red Earth sector of the Jaffna peninsula, which has excellent physical properties suitable for raising orchard crops. All these areas also possess the advantage of conveniently exploiting the large repository of the subterranean water table in northern Sri Lanka and also the natural water holes.

In economic terms this meant the following. Firstly, the localization of early Proto Historic communities to micro ecological zones. Secondly, precisely due to the restricted carrying capacity of the micro environmental zones they not only had to depend upon localized resources but as a consequence adhere to a broad spectrum subsistence pattern. Hence, be it the initial
period of seasonal visits to the north west coast where temporary camps may have been located, or during the process initiating greater sedentarization within the micro ecological zones, the broad spectrum subsistence pattern may not have differed much from the preceding mesolithic economy; the only additions being subsistence agriculture and pastoralism along with the iron technology and pottery. The ensuing study clearly establishes that all these additions were functionally restricted and received greater significance only in a different ecology (north central and south east plains of Sri Lanka) in a slightly later period (c. 3rd Cent. B.C. and after).

Considering the proximity of location to the ocean and the lagoons, marine life may have formed an important part of the diet. Recent excavations at Anaikottai and Karainagar in Jaffna, revealed shark bones within burial urns (Seneviratne 1984:240). At Kollankanattha while remains of marine turtle were found within subfossil layers (P. Deraniyagala 1938:F. 18, F. 20), shells of molluses have been associated with the BRW habitation site there (S. Deraniyagala 1972a:3).

It has been observed that the Latosol of the northwest with its large number of water holes and the sparse vegetation i.e. the monsoon scrub jungle, is excellent for a hunting culture (Panabokke 1979:239), which formed a frequent ecological niche of the Mesolithic people. The animal bones found within the burial urns at Pomparippu are significant in this context. These urns have yielded remains of rat, squirrel, bird (ASAnR 1937:16) and

I. Lebeck records that the northwest coast was infested with tiger, porcupine, wild hog, pangolin and tortoise (Steuart 1843:93).
monkey (Begley 1981:66, 75). The Pomparippu burials have also yielded a good deal of unspecified animal bones in association with skeletal remains of children and perhaps of young adults (ibid. 71-72). Abundance of bones of animals used as food have been found along the northwest coastline (P. Deraniyagala 1955-56: I37) and among them were remains of spotted deer and sambhur (ARCH 1938: f. 18, F. 20). The urn burials at Anaikottai also revealed cattle bones (Seneviratne op. cit.). Stratigraphic evidence from Anuradhapura show the large number of animal bones inflicted with (knife) cut marks that were encountered in strata 3A-B, which indicate the prominent role of hunting during the Proto Historic period (S. Deraniyagala 1972b:155 ff). Amongst the bone remains were those of the deer, pig, buffalo, cattle, terrapins, birds, mouse deer etc. The typology of the iron implements from the Megalithic burials of Sri Lanka also conform to those used within a hunting economy. 'Community participation' in hunting expeditions led by the chieftain appears to have been extremely significant in early Sri Lanka. Such an expedition was led by (Devānampiya) Tissa at Missaka pabbata in the rocky jungle tract east of Anuradhapura. In an earlier context, we read of 'princes' (Pandukabhaya's uncles) who conducted a hunting expedition and gave chase to a wild boar (Mv. X 89).

Pastoralism was an integral part of the broad spectrum subsistence economy of the Proto Historic period. Wild buffalo fossils have come to light within the gem pits of Ratnapura from the Pre Historic context (P. Deraniyagala 1953:103-6). The discovery of cattle bones from the urn burials at Anaikottai is significant (Seneviratne op. cit.). The Bos Indicus found within
the 'megalithic' levels at Anuradhapura may have been introduced along with the Iron Age culture from south India (S. Deraniyagala 1972b:156-7). The Mahavansa (in the Pandukabhaya episode) records the existence of herdsmen and also of a hamlet of the cowherds near Anuradhapura (ix.22; x.I2-I7). The ecology of northern Sri Lanka is more conducive for pastoral activity than the northwest. To this day plot farming/paddy cultivation are invariably linked to cattle/goat breeding in the Jaffna peninsula (Siriweera 1981:I7-18), where '... rice, vegetables and fruits are grown in a highly complicated system that requires fertilization with leaf mold and natural manures from the buffalo and cattle that are kept in pens on the land' (Stoudt 1961:33; Siriweera 1982). In any case we have no evidence to establish the existence of a strong pastoral tradition in Proto Historic Sri Lanka as compared to that which existed in Macro Zones I and II.

Subsistence agriculture was not incompatible within a broad spectrum subsistence economy, which was also the general pattern in other areas of the Primary Region during the formative period. The probable low demographic count during the formative period in the north west, the existence of communities that depended more on a marine-littoral ecology which had a low rain fall count (25-50 inches) and an infertile Lathosol soil region, and the restricted use of iron may have necessitated the adherence to subsistence agriculture based on swidden or plot cultivation as the most efficient method of land use in the micro ecological zone within the Hot Arid lowland Tropical bio-climatic region. Interestingly, two patches of cotton textile adhering to copper rods were unearthed at Pomparippu (Begley 1981:71, 78-81). In fact Kuveni is said to
have been spinning cotton when she met Vijaya (Mv. vii.11).

It is uncertain whether cotton was grown in north west Sri Lanka during the Proto Historic period or whether it was imported from Tirunelveli which has excellent black soil for this plant. Urn burials at Adichchanallur also revealed traces of cotton textile (Rea 1915:5).

Within this situation, these communities may have in all probability cultivated dry crops though remains of paddy alone have been found from Pomparippu in 1957 (Pers. Com. Raja de Silva 1957). Millet, which is not an indigenous plant, was probably introduced by the Iron Age folk arriving from south India.

Ethnographic studies made on swidden cultivation in northern Sri Lanka show that it is basically subsistence agriculture: the family unit conducts its own work: the utilization of simple implements: the periodic rotation of farmland (Brow 1978:100-3). A similar pattern may be applicable to the north west. This is because the environment of north west Sri Lanka and the technique of agriculture i.e. swidden cultivation did not require a sophisticated technology. The monsoon scrub jungle in the north west may be cleared by fire with ease and does not require an advanced metal technology for that purpose. In this sense, the limited use of iron in the Proto Historic context in the north did not hinder the existing production technique.

Similarly such agricultural methods also do not require sophisticated forms of water control. In any case the north west does not possess a suitable ecology for irrigated agriculture (Panabokke 1979:232). Whatever irrigation tanks that are found in the north west at present happen to be shallow and are situated on
extremely flat ground which in turn increase the rate of evaporation (Parker 1909:247). All requirements of water for human consumption, therefore, had to be obtained from the few perennial water courses, the *vii* (water holes) and from the subterranean water table. The ring wells from the historic levels at Kantarodai (Begley 1967:24), Mantai (ASAnR 1950:15) and at Kollankanatta (Brohier 1929) were such attempts made at reaching this subterranean water table. Brohier remarks that '... long before the remarkable and even stupendous engineering works in the form of tanks and channels were conceived and constructed over this maritime belt ... its prosperity was founded on a knowledge of the existence of a net work of subterranean rivers ...' (1935:II.19). It is interesting to note that the *Vamsatthapakāsini*, perhaps reflecting upon the situation in the north west, states that the earliest settlers from north India established settlements where water was readily available (1.261).

This assumption of not requiring sophisticated forms of water control for the subsistence economy in this area may find a clue from Pomparippu. In an effort to establish a corelation between the irrigation tank in the vicinity and the burials, a trench was dug across the bund of the nearest irrigation tank (50 mts.) north of trench 71/56). Here the excavators encountered burials 1.5 mts. below the bund (Begley 1981:64-5, Fig. 9). In this case the tank obviously post dates the burials. At Anuradhapur, artificial reservoirs of water apparently existed from stratum 2 (pre 400 B.C.) (S. Deyaniyagala 1972b:57, 159). Even if there had been efforts at devising some irrigation methods, the most original system would have been the simple, crude anicuts built
across water courses during the earliest period (Nicholas 1960: 47), where water was either diverted to the fields or fed a canal linking it with a reservoir. In any case swidden cultivated dry crops do not require such a regular supply of water. Apparently such dam construction was in vogue along the Tambapanni valley from a very early period.

II - v

In Chapter I we have already suggested the interplay of certain forces that may have prompted the spread of the Iron Age culture to the northern plains of Sri Lanka. These may be stated as the relative demographic expansion demanding greater surplus in food production, the need for more cultivable land and also a suitable topography for water storage and irrigation. Besides raw material requirements there was also the process of physical and cultural integration with the Mesolithic people in the northern areas.

There may have been two major self limiting factors that made it difficult to maintain within a broad spectrum economy, the existing equilibrium for long in the settlements of north west Sri Lanka. These may be shown as the environmental factor and the demographic factor.

Taking up the first, Panabokke has very correctly advanced several reasons that undermined the efforts at evolving stable agricultural settlements in the Latosol of the north west. For instance, the absence of storage tanks outside micro ecological zones associated with rivers was due to the limited capacity to
store water owing to the extremely high permeability of these soils. Another was extremely poor chemical fertility of these soils which drastically limits even swidden cultivation (1979:232). Moreover, even if swidden cultivation is carried out on the narrow alluvial tracts of the micro ecological zones, progressively this undermines the productivity of the soil. Hence, the basic problem involved here is the unfertile Latosol which acts as a restricting factor preventing the extension of (swidden) cultivation beyond the micro ecological zone.

Secondly, even if agriculture was extended beyond the micro ecological zones it may have entailed a problem of distance. This would mean that the farmland had to be located at a considerable distance from the nucleated settlement within the micro ecological zone. As Chisholm shows, the decline in the net returns become significant if the plot is 1 km. beyond the place of residence (1967). Even if such habitation sites did exist beyond the micro ecological zones, these had to be sustained by the communities residing within micro ecological zones. For example, Kollankanatta is not only a coastal (chank) factory cum habitation site, it was located on the Latosol and did not possess a hinterland agrarian base (S. Deraniyagala 1972a:3). As we have already observed, animals may have formed a good portion of the diet at these sites and it is also possible that the chank products may have been a medium of exchange for food. Apart from the existing population within the micro ecological zone, the resources of a swidden cultivating system may have been insufficient to sustain an additional population of a centre of production such as
Kollankanatta.

Thirdly, we also cannot overlook a possible demographic expansion that may have taken place within the micro ecological zones. In this context we may consider certain suggestions put forward by the excavator of Pomparippu on the basis of the evidence unearthed there. According to the excavator, the burials are a part of a single culture complex but the cemetery necessarily represents several generations of population (Begley 1981: 66). A rough estimate indicates the existence of about 8000 burials and an approximate figure of about 10,000 buried at this site (ibid. 57). It has also been observed that the frequency with which more than one individual was deposited within the urns was more deliberate than by chance (ibid. 67). This situation may either represent clan burials or a deliberate over-crowding of burials. The above evidence may possibly indicate a demographic expansion in the north west which may have been a burden on the carrying capacity of the ecology in this area. Given the economic structure, the north west did not have a prosperous base. The people in this area as evident from the burials of Pomparippu, lived within a backward economy and the 'graves represent people of modest means' (Begley op.cit. 67). In fact child burials which appear to out-number other burials at Pomparippu (ibid. 66, Table 2), may indicate the high frequency of child mortality in a backward economy. In addition to this, the process

I. It is difficult to estimate the demography of Kollankanatta in order to have an idea of the people that had to be sustained at a non-agricultural production centre. In the early 20th Cent. the Tinnevelly chank fishery employed an average of 70 divers. The total population with their families worked up to about 350 persons (Hornell 1914:21).
of physical integration of the Mesolithic people with the Iron Age culture complex in northern Sri Lanka may have contributed to some extent in swelling the population of the Proto Historic habitation sites. At Anuradhapura, the citadel excavation revealed not only an intrusive element but also a rapid accumulation of cultural deposits 3A-B (S. Deraniyagala 1972b:159), which may again indicate an expanding population and economy as well.

It is perhaps after this initial period that we find an emphasis on the importance of the two major nuclear areas (North central and south east Sri Lanka), where relatively more sedentary agrarian communities gradually evolved in the post 5th - 4th Cent. B.C. period. The Hot Dry Lowland Tropical bio-climatic zone has an annual rainfall of 50-70 inca. (from the north-east monsoon only), and composed of Reddish-Brown earth and monsoon forests, and also possesses an excellent terrain for irrigated agriculture. While there is a series of Megalithic-BRW sites concentrated in the north, some of the earliest settlements established by the 'north Indian colonizers' mentioned in the texts are also associated with these two nuclear areas viz. Anuradha gāma (Mv. vii.43), Upatissa gāma (ibid. vii.44) Vijita nagara (ibid. vii. 45)/Vijita gāma (ibid. ix.10), Rama gona (ibid. ix.9), Digha gāma (ibid. ix.10) and Rohana (ibid.).

I. As we have pointed out elsewhere, the south eastern nuclear area
has not yielded any remains of Megalithic burials so far. Evidence is also lacking for the prevalence of typical 'Megalithic' BRW in this area. Though Tissamaharama, the Early Historic political centre of the south east (Parker 1884) and its coastal sites viz. Ambalantota (Pers Com. Roland Silva) and Bundala-Patirajawela (S. Deraniyagala 1981:150, Fig. 8), have yielded BRW from excavations, these apparently are coeval with the typology from stratum 4A (c. 250 B.C.) of Anuradhapura (Pers Com. S. Deraniyagala). The surface collections of BRW
Rice, which became the staple diet of the succeeding hydraulic society of Sri Lanka during the Early Historic period may have also been introduced by the Iron Age culture from south India, along with other dry crops such as millet. Remains of rice have been reported from Pomparippu (Pers Com. Raja de Silva I98I) and stratigraphic evidence from Anuradhapura revealed that rice husk was employed as a tempering daub in 'megalithic' 3A and B (S. Deraniyagala I972b:159). We may note here that, according to the literary traditions, Yakkhas were already familiar with rice when Vijaya arrived in north west Sri Lanka (Mv. vii.23-25). By the Early Historic period, other domesticated cereals such as coix Lachryma jobi (Sin. kee-kirindi) appear from the stratified context of 4A (Deraniyagala op.cit.), kee-kirindi is known as 'an edible cereal which grows in rice fields and it is said to have been naturalised in Ceylon' (ibid.).

The need to obtain a regular supply of water, gave the coastal as well as the inland sites in both nuclear areas (north central and south east) a characteristic feature of being located on river banks. Though small tanks are present in the vicinity of almost all Proto and Early Historic sites, the antiquity of these small reservoirs cannot be determined with precision. Nicholas is correct when he states that '... by the Ist Century B.C., probably nothing larger than the village tank had been attempted' (I960:44).

Cont'd ... f.n. from pg.191 made from south east Sri Lanka also present a similar typological and chronological context (Solheim et Deraniyagala I972).

I. Agricultural activity (reaping) around Girikanda (near a mountain south east of Anuradhapura) is mentioned during the time of Pandukabhaya (Mv. x.28-30).
It is unknown whether the presence of evidence pertaining to the existence of a body of water in stratum 2 at Anuradhapura (S. Deraniyagala op.cit. 52, 159) is a result of attempts made at dam irrigation from the Kadamba nadi (Malwatu oya). Interestingly, Turnour's edition of the Mahāvamsa (1837:100) records the diversion of the kadamba nadi by the Damila horse merchants Sena and Guttaka so that it flowed closer to Anuradhapura enabling them to perform rituals associated with water. It is also likely that a natural pond existed around this area. The Mahāvamsa records the deepening and the conversion of an existing natural pond into a reservoir which was named Jaya vāpi by Pandukâbhaya (Ny. x. 10, 83). The earliest construction of a reservoir at Anuradhapura is attributed to Anuradha who is said to have been a contemporary of Vijaya (Ny. ix.II). It is also possible that the habitation site at Tissamaharama, which yielded Early Historic BRH was associated with the adjacent small reservoir from its very inception (Parker 1884:19-24). In this context we may observe that the earliest reference to tank owning private individuals i.e. vāpi hamika cannot be placed before the 1st Cent. B.C. This means that the earliest period obviously had small tanks in association with the settlement where a common ownership of water was in all probability held by the resident king group.

Rice cultivation and also minor irrigation activity may permit us to infer that the plough was in existence at least by the 4th Cent. B.C. The Mahāvamsa records the use of the plough by Devānampiyatissa to demarcate the boundaries of religious establishments (Ny. xv.19I-194). A plough coulter is said to have been unearthed from a cist at Diwul wewa (Pers. Com. S.K. Sitrampalam
The Reddish Brown Earth region not only had a suitable terrain and soil condition ideally suited for the construction of simple water tanks, but the "... hard non-friable soils of the bottom lands which lay below the tanks or reservoirs could be tilled only after the soil had been moistened and softened with water" (Panabokke 1979:232). This meant that for cultivation purposes, this soil necessarily had to be irrigated and then ploughed. Under these circumstances it is not surprising that Anuradhapura has yielded more iron artefacts (S. Deraniyagala 1972b:152) than Pomparippu (Begley 1981:77-78). Further, the existence of metal tools made an inland penetration relatively easy. Such tools could not only control the natural vegetation in these areas that always revert to forest (Panabokke 1979:231) but also overturn the soil for agricultural purposes.

The present 'village Veddas' of Anuradhapura use only an axe, a mamady (hoe) and a sickle for swidden cultivation (Brow 1978:103). The existence of the remains of the Bos and Bubalus in 3A at Anuradhapura (S. Deraniyagala 1972b:155) may indicate that in all probability this animal was harnessed for agricultural purposes in addition to its use for drawing carts and as a pack-animal in transport.

In this context we may also note that the deep perforated dish from 3A at Anuradhapura (S. Deraniyagala 1972b:80, Fig. 25 D, 107) was a utilitarian domestic ware that was used for washing and sieving cereals. Similarly the rimless tray bowl having either a convex or a flat bottom viz. type Ib of 1969 Anuradhapura citadel excavation (ibid. 76 Fig. 12) known as a tāṭiyā (Gunasekare et al 1971:174 Nos. IIa, IIIb, Figs. in p., 182), has a...
utilitarian function for a rice based diet. Though the basic type does occur in 3A at Anuradhapura, it begins to intensify only in the subsequent layer 3B and in stratum 4A, and invariably belongs to the Black or the BRW ceramic type (ibid. 106-II6). These dishes occur in a limited variety at Pompappu (ASAR 1957:Q-I3; 1965-66:I36; Regley 1981:86-7 types 2a, 3a). The increased intensity of occurrence as well as varieties of this utilitarian type substantiates our view about an expansion of the agrarian base in the post 200 B.C. period. This epoch is represented by stratum 4A at Anuradhapura. Our hypothesis may be further substantiated by the occurrence of large cooking or storage vessels which are typical of stratum 4A at Anuradhapura (S. Deraniyagala 1972b:66 type 3AII, 68 type 4AII, 70 type 5LI, III, type 5MIII, iv, 72 type 8W, X). The above listed types occur in fact for the first time in 4A (ibid. I20).

The movement of people and associated culture elements to inland agrarian tracts did not necessarily see the sudden development of a paddy cultivating hydraulic society and its associated technological advancements and institutional developments. S. Deraniyagala in fact observes that 3A material at Anuradhapura is technologically inferior to that of 4A and B (1972b:12I). This applies to all fields and it reflects a society that had yet not stepped rapidly towards an advanced agrarian society. This is clearly seen in the subsistence pattern that apparently prevailed in stratum 3A-B at Anuradhapura which may be dated to a pre c. 200 B.C. period. Swidden cultivation and hunting prevailed therefore as two dominant aspects of the subsistence economy even during the Early Historic period.
Panabokke further indicates that, 'the land that lay above the irrigable command could not be disciplined by the plough ... the only feasible technique of easily handling the Reddish Brown Earths without irrigation for agricultural purposes was the slash-and-burn ... cultivation which involved little or no working of the soil. Thus evolved that unique system of land use in the Dry zone of Ceylon where settled irrigated rice culture was integrally linked with 'chena' or shifting cultivation' (1979:232, 233). The existence of this form of cultivation side by side with irrigated agriculture and also of individuals who profited from such dry crops are relatively well documented in the Early Historic texts (vide Ellawala 1969:130-2, for a documentation of details).

Administrative records of the colonial period confirm the prevalence of these aspects in the dry zone, more specifically in the North Central Province. In one case, the report clearly states that when there were no massive irrigation schemes in operation, the staple food of the mass of the population in the north central province was kurakkan (finger millet) which was a chena product (Brow 1978:92). These reports also mention that during the 17th-18th Cent. forest land surrounding a village in the North Central Province was used for rotational chena cultivation exclusively by the peasants who had shares in the village tanks and fields (cited Siziweera 1981:33).I

During the Early Historic period the two ancient nuclear areas of Sri Lanka apparently did not face the same dilemma as the north western areas about the falling rate of production (out-

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I. A chena in the north central province is about 1-3 acres in size (Brow 1978:102).
put) due to a progressive decline in soil fertility created by swidden cultivation. It has been stated that the Reddish Brown Earth is chemically very fertile and even under intense swidden cultivation there is a tendency for the natural vegetation to revert to forest (Panabokke 1979:231). As Farmer comments, the physiographic conditions viz. the regeneration of soil within 5-10 years due to nitrogen and nutrients being made available by the burning of jungle in the north central area, have sustained chena cultivation for centuries in high land near villages without impairing the soil (Farmer 1957:48).

Secondly, archaeological excavations show that hunting continued to be a significant aspect of the economy. S. Deraniyagala notes that particularly in 4A, bones showing cut marks are associated within ash and charcoal remains. He also observes that the faunal assemblages show no marked change from 3A to 4B and 'the high incidence of cervid remains indicates that hunting was important' (1972b:155). It has also been shown by us that the general assemblage of iron tools from the megalithic-BRV burials show weapons of war and of the chase (Seneviratne 1984: 272 ff.). In the extreme south, the Early Historic habitation site at Tissamaharama also has similar traits. Parker reports that 14-18 ft. below surface level, ashes of charcoal were associated with burnt Sambur bones (Parker 1884:24). From another place that looked like a room of a dwelling quarter, Parker uncovered bones of cattle (ibid. 29). Parker also lists the variety of bones that had cut or burnt marks on them viz. Sambur, elk, axis

I. Usually a chena is cultivated for two years in the north central province and then abandoned (Farmer 1957:48).
(spotted deer), buffaloes, wild pigs, monkeys (ibid. 44). Explorations along the eastern and southeastern coast at sites, such as Illankatutai, Panamai Madura Gala indicate that hunting was associated with the Early Historic BW that falls into the post 200 A.D. period (Solheim et Devaniyazala 1972:21-27, 32-36) which is coeval and even post dates 4B at Anuradhapura.

The above evidence may well indicate the significance of swidden cultivation and hunting in the economy even during the Early Historic period.

II - vi

The nature of social interaction in Macro Zone III during the Proto-Historic period apparently did not differ much from the other two macro zones of the Primary Region. We are, however, unable to ascertain the qualitative difference or similarities between the pre-Iron Age kinship structure as well as other forms of social interactions with those of the Iron Age culture. Archaeological and palaeoanthropological evidence enumerated above may indicate the interaction between two techno-cultural groups. This interaction is perhaps best reflected in the legendary Kuveni-Vijaya and Pundukabhaya-Yakkha episodes narrated in the early Pali texts of Sri Lanka. If our assumption about a cultural and physical admixture between the Neolithic and the Megalithic holds good at least for northern Sri Lanka, then we may speak of two conditions that made a cultural synthesis between these two technological groups relatively easy. Firstly, the probable existence of certain common elements of social interaction that
did not radically differ in the two groups. The existence of a non-rigid, flexible social interaction associated with more advanced culture which was capable of integrating other (lower) forms of culture to its fold rather than alienate them.

Let us elaborate this argument. The social structure of the pre Iron Age culture in Sri Lanka by inference may be assigned to a 'band' society that had a tribal formation, a situation that is still apparent amongst the jungle Veddas who adhere to a hunting-gathering economy. In this context we may note that the Veddas have a strong tradition of monogamy and equal status of women (Seligmann 1911), while they also seem to continue a matrilineal clan tradition to this day (Leach 1963:68-78). Leadership amongst such Vedda groups is clearly concentrated in the hands of a male, a member of the clan or the tribe.

As the Mesolithic of southern Tamilnadu and Sri Lanka belonged to a single culture complex (supra pp.66-67), it is likely that the iron using culture (which may have integrated the existing Mesolithic culture in Tamilnadu) was not totally unaware of the social interactions of the Mesolithic people in Sri Lanka. In any case the segmentary lineage system, the cross-cousin marriage system and the central role played by the woman as well as the parallel male domination or control, which are features that have been attributed to the megalithic culture may not have been totally juxtaposed to the existing Mesolithic social structure.

The Yakkhas and the Rākṣasas described in the Pāli texts of Sri Lanka in all probability may be identified with the indigenous Mesolithic communities. We may emphasisetwo instances in the Vijaya-Kuveni episode where matrilineal traits appear to have been
significant amongst the Yakkas. Describing the marriage ceremony of the Yakkhas at Sirissavatthu, the Mahāvamsa makes a specific reference to the arrival of the bride's mother i.e. 'tattā mata cha āgata' (Mv. vii.33). Secondly, during Kuveni's exile and her subsequent death, the children were protected by her maternal uncle i.e. mātula Yakkha (Mv. vii.65).

Similarly a reconstruction of the kinship structure of the Naga groups from the Pāli texts again suggests a matriarchal situation, or at any rate a deviation from the accepted norms of patriarchy, a tradition normally associated with the Indo-Aryan speakers of the north rather than the Dravidian speaking south. The chart (No. 4 p. 192) is reconstructed on the basis of the details given in the Mahāvamsa (i.44-76), which provides us with certain clues about the kinship system as well as social interactions. First, we see that the grandfather of Chulodara had bequeathed the jeweled throne to his daughter or Chulodara's mother (property right to the daughter) which Chulodara attempted to retain (property right coming from the mother). Secondly, during this confrontation between Chulodara and Mahodara, the latter's maternal uncle (Mv. I.63) came to his aid (the role of the mother's brother in family affairs).

In this context some terms used in the early Brahmi inscriptions of Sri Lanka may throw light on the vestiges of certain kinship terms that gradually became blurred after a greater process of acculturation of the residential groups to the Indo-Aryan culture stream.

There are several instances where the Dravidian kinship term marumakan is used in the form of marumakana in the Brahmi
The Nagas of northwest and western Sri Lanka

(According to the Mahāvamsa)

Chart No. 4

Nāga-rāja of Kannavaddāma + Mahōdara's younger sister Mahōdara
Pabbata | sister Nagadipa

Chulōdara

inscriptions (Paranavitana 1970: Mos. 83, 487, 643, 744, 1142, 1161, 1202). Paranavitana has consistently translated this term as 'grand son'. But we have seen in the south Indian context that it is essentially used for the nephew and son-in-law, which was the consequence of the cross-cousin marriage system. The literary texts also clearly show that during the pre Devānampiyatissa period, this form of marriage system was not unknown amongst the chieftains. Pandukābhaya's parents were cross cousin (Mv. ix.I3-I9). Again the text describes Pandukābhaya's father-in-law Girikandasiva as mātula i.e. maternal uncle (Mv. x.29).

Though the Pandukābhaya 'legend' is a fanciful narration, the persistent mentioning of the cross-cousin system is significant. Further, the hostility shown to Pandukābhaya by a group of his maternal uncles is also interesting. The narration clearly shows that Abhaya his senior most maternal uncle was well disposed towards him and was willing to concede a portion of the territory to Pandukābhaya (Mv. x.43-49), which may have been the latter's
THE LINEAGE OF PANDUKABHAYA (ACCORDING TO THE MAHĀVAMSĀ)

SINHABĀHU + SINHASĪVALĪ

SUMITTA KUJENI+ <VIJAYA> + PĀṇḍya PRINCESS

JIVAHATTA DIPELLA

PANḍuvāsudeva + Baddhakāchchana DīśāYU VIJITA ROHANA RĀMA URUVELA ANURĀDHA

ABHAYA (AND 10 BROTHERS) UNĀDACHITĀ + DĪŚAGĀMINĪ

DAUGHTER OF + PANDUKABHAYA MATERNAL UNCLE

MŪTASIVA

AMITODANA (Ś'AKYA)

PANḍUSĀKYA
legitimate right. This was however opposed by the other uncles (My. Chapter x; Chart No. 5).

The existence of Megalithic remains akin to those of south India, may have in all probability evolved a social structure in northern Sri Lanka that was closer to the one in the former area. We have suggested the probable existence of segmentary lineage groups in Macro Zone I and II. Here the kinship structure on the whole appears to have been perpetuated by the cross-cousin marriage system and by the lineage chief i.e. perumakan. In this context the occurrence of the term parumaka/parumaka in the early Brahmi inscriptions is significant. It is quite possible that this term derives from the word perumakan and not pramukha as has been suggested by some (infra pp. 37). The fact that a large number of parumaka inscriptions are located in the vicinity of Megalithic-ERW sites again establish some relationship between this group and the Proto Historic sites. We have also observed the identical non-Brahmi symbols on the pre-Christian cave inscriptions of Sri Lanka occurring on the BRW of Sri Lanka which are related to the group of symbols in megalithic southern Deccan and south India (Seneviratne 1984:296-298). The parumaka in early Sri Lanka may have enjoyed the same status as the perumakan in south India who claimed descent from the lineage ancestor and was also the leader of the resident kin group.

The early Brahmi inscriptions also throw light on the existence of such residential groups. The inscriptions speak perhaps of clans when they mention terms such as Vemaruka or Kabhoja (Paranavitana 1970:Nos. 679, 553, 990). Archaeological evidence also indicates that the Megalithic burials in Sri Lanka in all probability
represent clan/tribal burial grounds of the kin groups, a situation which may have also prevailed in association with the subcontinental Megalithic culture. By inference we may conclude that Pomparippu may also reflect such a situation where it represents a clan or tribal burial ground. For instance, the excavators unearthed a large pit (in Trench 35/40) which accommodated several independent urn burials (Begley 1981:60-62). A study of the skeletal remains in another burial (Trench 71/56), indicated that more than one individual had been interred at different times (ibid. 63, 72). In a third case a 'tumuli' (in Trench 27/80 was uncovered where it had not only several burials but at least two phases (ibid. 64-5). The excavator at Pomparippu also remarks that the high incidence of cramming bones of more than one individual i.e. bones of children and adults in a single urn appears to be deliberate (ibid. 67). This may either indicate the association of kin groups within the urns or as we suggested earlier, probably population pressure. The occurrence of 'family burials' at Pomparippu, a site that apparently had a physical and cultural integration between the Megalithic and Neolithic groups, may also be viewed in the context of the existence of 'family burials' associated with the pre iron Neolithic Balangoda culture of Sri Lanka (supra pp.64-5). As we have pointed out elsewhere, the existing economic structure i.e. broad spectrum subsistence pattern based on marine resources, hunting-gathering, pastoralism and swidden cultivation, is one that functions in association with small communities, invariably represented by the resident kin group. For instance, ethnographic studies show that in Anuradhapura area, the entire household
cultivates the chena and the produce is generally consumed within the household (Brow 1978:100-2).

It is relatively clear that in the field of crafts, the Proto Historic community in Sri Lanka operated within a restricted area. Our investigations indicate that, in general, all crafts (ceramic, metal, bead making etc.) had no sophisticated production techniques. The qualitative improvement of the technology as well as the product was a gradual one. This is also common to the field of resource utilization. A wider range of mineral stones, for instance, came to be utilized only during the Early Historic period. The same applies to iron ore, copper and other minerals associated with the metal industry. Due to this low intensity in production and the limited utilization of the technology, the habitation centres during the Proto Historic period, were also centres of production and distribution. The occurrence of (iron and copper) ore and unworked and semi worked mineral stones from the Proto Historic levels may substantiate this assumption. It may therefore be assumed that this was a feature of the household economy where the family or the extended kin group formed the labour pool or the unit of production using simple implements (for a complete study of resource use and the technology of the household economy during the Proto Historic period in Sri Lanka vide Seneviratne 1984:268-279; also see Chapter IV).

I. For ethnographic notes on the method of household production in the fields of potters craft and iron and steel production during the late 19th Cent. vide Coomaraswamy 1907:1-18, 135-141; 1908:189-196).
One of the most significant developments that took place during the Proto Historic period was a relative intensification of the interaction between different physical as well as ecological zones in the island. Some semblance of this interaction had already appeared during the preceding Mesolithic period, where a rudimentary network of routes linked the littoral, the dry zone plains and the forest uplands. To some extent, the knowledge about the location of strategic resources may have been communicated to the iron using folk due to the very existence of a pre-Iron Age network of communication and also due to the possible physical and cultural integration between these two techno-cultural groups. For instance, the Mesolithic people were aware of the variations in the mineral content in some rocks and soils. They used haematite and limonite in the preparation of pigment for cave paintings (vide S. Deraniyagala 1971:38). We may also note that the quartz bearing veins where there are also surface iron concretions contain a good number of the Mesolithic sites in the northern province. Similarly Megalithic-BRW sites seem to coincide with areas graded as 'soils with a high proportion of quartz or iron-stone gravel ...' (vide Panabokke 1967).

In this context it is apparent that the river valleys proved

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I. Judging by the location of early Brahmi inscriptions, a route linking the northern plains and the central hills traversed the Dambulla–Walanda–Matale–Kandy area, which apparently ran close to the Elahera gem bearing sites as well as the mica producing areas. The Mahāvamsa records the discovery of silver by a merchant along another route leading to the hills, during the reign of Dutthagamani (xxviii–20–22).
to be convenient routes traversing different physical and ecological zones. The location of the Megalithic-BRW sites in three ecological zones viz. littoral, inland RBE tracts, the low montane areas, and also the general distribution pattern along the river valleys may substantiate the above assumption. This fact is further confirmed by considering the distribution pattern of the early Brahmi inscriptions (3rd Cent. B.C. and after), which generally follow river valleys into the central hills. Unless such routes existed one cannot account for the movement of lagoon shells to the Mesolithic sites in the upper Kelani valley (vide S. Deraniyagala 1981:152). Similarly, the association of the estuary of Kelani i.e. ancient Kalyāni with gems and the Nāgas (who were probably intermediaries or agents of long distance trade) in the early Pāli texts of Sri Lanka, may have been based on a pre-existing tradition on the movement of these resources from the hills to the coastal areas along the river. In this context the discovery of at least five sites yielding BRW from the lower Kelani valley is significant. The same may be said of mica, which mainly occur in the low montane area of the northern hills, and have been found within the burials at Pomparippu (AASAnR. 1957:30-31). The fact that mica is found within the burials of Pin wewa (AASAdR. 1967-68:78) clearly shows that this mineral reached the coastal area by moving along a route following the river Deduru.

The limited empirical data at hand is insufficient to determine

I. According to S. Deraniyagala the BRW at Kitulgala seems to have its correlative typology in 3A at Anuradhapura Gedige (1980:201 Note). A pit burial site was found at Makevita (Gampaha) and an urn burial was unearthed at Nella (Mirigama), on the lower Maha oya valley.
the nature of the exchange mechanism. However, classical authors records the existence of silent barter between the local population and the Sere merchants (Pliny Book vi/McCrindle I90I:106 ff.). To this day, the Veddas conduct a system of silent barter with the agricultural communities and the village craftsman (Seligmann I9II). This form of exchange occurred at the micro level. It was, however, the macro-exchange zones that witnessed the movement of items such as salt and grain up the river valleys (P. Deraniyagala I955:30I; S. Deraniyagala I908:20I; I98I:152) or the movement of minerals such as mica and mineral stone down the river valleys to the plains and the coastal areas. The macro-exchange network could have operated if there were a specialized group of merchants; alternatively the location of clan groups or at least habitation sites at regular intervals within a particular geo-physical context could supplement the functioning of a 'down-the-line' exchange mechanism. It is quite evident that during the Proto Historic period a class of full-time merchants or a relatively well developed communication system had not evolved. The exchange system may have been sustained in the following manners: an exchange between two different techno-cultural groups viz. the stone using and the iron using folk or 'down-the-line' exchange system, especially touching (clan) settlements along the river valleys. The Megalithic sites along the Kala oya valley or the Maha oya spread from the lower montane to the coastal area viz. Ibbankattuwa, Machchagama, Karamban kulam

I. At least by the Early Historic period the regular requirements of spices seems to have been obtained from the lower montane area of the northern hills (MV. xxviii.2I-22).
Pomparippu or Gal-atar, Padavigampela, Nella. There is little evidence to establish the existence of itinerant craftsmen who provided their services to settlements. Production apparently was localized. Though ethnographic evidence show that in the pre-colonial period pack animals (Sin. tavalama) transported salt, grain and other items including pottery (which were sometimes carried as a pingo load by the potter himself) to distant places (vide Coomaraswamy I907:2; Siriweera I980:22), the possibility of projecting this mechanism to the Proto Historic period is rather doubtful. I

In the same manner it is relatively difficult to quantify the movement of resources from one zone to another. Even with the limited work done at Proto Historic sites it is evident that certain luxury/prestige items such as chank and pearl were largely channeled to external areas and apparently circulated less within the island during this period. The nature of resources and the initial access to them may have also determined the quantity of resources that circulated. For instance, as a weight gaining item, precious/semi precious stones may have had a limited circulation during the Proto Historic period. Secondly, the backward communication network also does not encourage efficient movement of resources.

We may present certain archaeological evidence to substantiate the above assumption. The low intensity of beads made of semi precious stone in 3A/B at Gedige and also at Pomparippu may indicate a physical limitation imposed on the direct access to

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I. The wandering gypsies of Sri Lanka (Sin. Ahikuntika) indulge in pastoral activity and also trade in cattle (vide Wichramasingha
the raw material located in the central hills or for that matter even in areas such as Elahera during the Proto Historic period. This was perhaps due to the concentration of habitation sites in the coastal areas and in the lower plains, thus creating a relative distance from the source areas. On the other hand the profuse occurrence of beads made of semi precious stone in 4A/B at the Gedige and at other sites such as Kantarodai, Mantai, Tissamaharama may indicate a relatively better developed exchange mechanism between the plains and the hills as well as a greater familiarity with the resources mainly in the central hills during the Early Historic period. In this context we may also note that the raw material for the manufacture of carnelian had to be imported from south India, as Sri Lanka does not possess this variety. Mapikara (Lapidary) is mentioned in the Brahmi inscriptions viz. Yatahalena, Mampita Vihara, Galge (vide Paranavitana I970:Nos. 546, 79I, II22 also No. 830).

Cont'd ... f.n. from p.,I9I6-I7:276; also Bell I9I6-I7:I08-II4; Thananjeyarajasingham I973:II3-I30).

I. The Mahāvamsa records the discovery of valuable resources during the reign of Devānampiyatissa and Duṭṭhaṅgāmāpi. 7 Yojanas (about 60 miles) north of Anuradhapura adjoining a tank at Pelivapikagāma, which is identified with Vavunikkulam (Parker I909:365), precious gems are said to have emerged during the reign of Duṭṭhaṅgāmāpi (MV. xxviii. 39-40). This site is only a few miles south of the Mamaduwa burials. We may also note the occurrence of finished and unfinished beads as well as lumps of semi precious stone from the Early Historic levels at the Gedige (S. Deraniyagala I972b:I35f. form IA to II8), Mantai (Boake I887: IIO-III; Carswell et Prickette I884) and also at Tissamaharama (Parker I884:60), which clearly show that the raw material was transported from the source to these centres of production.
The socio-economic formations of the Primary Region outlined in this chapter help to understand the qualitative and the quantitative developments within time and space. The following emerged as the most important and crucial features during the formative period.

First, the pre-urban period or the early Proto Historic period was assigned a tentative chronological position extending from about 1000 to 6/500 B.C. The early Iron Age did not show a sharp break from the preceding Neolithic-Chalcolithic production technique. Though new cultural elements and technological elements were introduced, the latter did not create radical transformations or undergo greater improvements. The Iron Age folk expanded the geographical horizon, and intensified the pre-existing minor crafts and the exchange network in a limited sense.

Secondly, the proto urban period, which ranges from 6/5th Cent. B.C. to 3rd/2nd Cent. B.C., saw the emergence of more dynamic economic forces. This period witnessed an emphasis on new ecological zones, total sedentarization, technological innovation related to iron and hydraulic control, a proliferation of plough agriculture and rice cultivation and also the noticeable change in population expansion leading to the incipient beginnings of townships.

Finally, the post 2nd/Ist Cent. B.C. witnessed the logical culmination of the preceding developments leading to the full-fledged urban economy with all its structural attributes. This aspect will be elaborated in Chapter IV.

The following chapter dealing with the political basis of
the Proto and the Early Historic society will complete the scenario of the formative period in the Primary Region.