CHAPTER I

The ecology and the archaeology of the Proto Historic cultural matrix

The relationship and the equation between the natural/physical region and the historical/linguistic/cultural region has been subject to many debates. It was perhaps Subbarao who realized the necessity to place this relationship/equation within time and space (1958: 8 ff.). He emphasised the organic link between the physical and the cultural regions (1968: 159-160). Subbarao correctly showed that as we move back in history to the formative period i.e. the Proto Historic and the Early Historic period, there is a tendency for the archaeological regions to coincide with the physical region. Yet, during the historical period he also observed that there is a persistent conflict between two diverse movements - the one vertical, the other horizontal. While the former is represented by the dominant cultural traits of a centripetal force, the latter relates to the indigenous sub-stratum culture traits of a centrifugal force (also see Schwartzberg 1977: 197-233). In this sense it is possible to see an equation between regions and regionalism where the natural/physical region often is the historical/linguistic/cultural region, where institutional development have a distinct identity.

The above should not be confused with an unscientific concept about regions and regionalism in India. Scholars have often attempted at defining geographical zones within the Indian subcontinent and
their relative significance vis a vis the Indo-Gangetic plain (Richards 1933:235-243; Panikkar 1955:30). The primary locus of civilization has been attributed to the northern plains and all developments taking place in other geographical zones of the subcontinent have been defined as the 'regional pattern'.

The formative period i.e. the Proto Historic and the Early Historic period, in the area under study is represented by a relatively homogeneous cultural matrix i.e. the iron using Megalithic Black and Red Ware culture, that extends southwards from the Deccan. The geographical spread of this cultural matrix, however, must be closely considered alongside the ecological factor. Since the nuclear/core areas offered the greatest potential for institutional development, the peripheral areas naturally played a subordinate or a secondary role. This not only saw an uneven geographical distribution of the cultural matrix in physical terms, but also an uneven development of institutions between the nuclear and the peripheral areas.

Given the above situation during the Early Historic period and after, the interplay between the horizontal and the vertical movements was sharpest in the nuclear/core areas. The horizontal movement was represented by the political force (Mauryas, Sātavāhanas), economic force (coinage, guilds, merchants, commodities), cultural force (Brahmi script, the Prākrit/Sanskrit languages, life style, personal names, kinship and other social terms, art and architecture) as well as the ideological force (religious cults, practices, doctrines, political ideology and concepts, titles etc.). The vertical movement represented by the indigenous culture assimilated, underwent transformations and yet emerged with its own distinct identity and peculiarities.

Interestingly this interplay of movements activated the centrifugal
tendencies. Depending on the qualitative and the quantitative character of its resources, each nuclear area developed its own institutions. These not only encouraged a distinction between the nuclear and peripheral area, but also the peculiarities that differentiated nuclear areas from each other.

It is within this context that we have to understand the role of the social ideology to the agrarian communities, the craft and merchant groups and the political groups in south east India and Sri Lanka approximately from 3rd Cent. B.C. to 3rd Cent. A.D.

II - i

A discussion of the archaeology and the geographical context of the formative period or the Proto Historic cultural matrix is important to grasp the essentials of institutional development of the primary region in the post 4th-3rd Cent. B.C. i.e. the Early Historic period. The following framework may prove to be a useful one to ascertain the archaeology of the early communities, their migratory pattern, chrono-cultural and ecological context.

The migratory pattern: The first is, the necessity to establish the migratory route(s) utilized by these communities on the basis of concrete evidence. The second is to observe the nature of the migratory course i.e. sea or land routes and the logical necessity that sets in motion the migration within a particular geographical context. In this connection it is useful to establish the affiliated subsistence pattern as it often tallies with the geographical situation. Periodic rotations within a fixed geographical area may also be considered within this context.
The causal relationships. This implies the necessity for a group or groups to 'move' or 'push' from point A to B, B to C and so on. Factors leading to this mobility may be seen within environmental changes undermining the subsistence pattern, the demography (either an increase or a decrease in population affecting food production in terms of land and labour), the requirement of raw material and even the necessity to control such areas, exchange necessities, political strife resulting in socio-economic instability or even factors such as plague, famine or natural disasters. In this connection the kinship structure can act as a mechanism of mobility.

The cultural context: The cultural identity and its relative development may be first assigned to a community on the basis of its primary subsistence pattern, the nature of the technology and the associated socio-economic institutions. The second is to ascertain certain distinct cultural traits viz. a particular ceramic/metal assemblage, burial practices, house/settlement type and even a language distributed within time and space may indicate the degree of techno-cultural homogeneity. As a third factor, the process of acculturation or the cultural interaction is also crucial. This reveals whether the new arrivals or only aspects of their techno-cultural elements were assimilated into the existing culture or whether they absorbed into their fold the existing culture by a process of cultural subordination, and also whether this integration was a peaceful or a violent one.

The cultural matrix of the Proto Historic period in the Primary Region is the iron using Megalithic Black and Red Ware (henceforth PRW) culture. Before we discuss the archaeology of the Proto Historic communities three important geo-cultural antecedents have to be outlined
Firstly, the geographical contiguity of Karnataka (former Mysore) to the Macro Zones I and II. The Krishna, Tungabhadra, the Kaveri and the Pennar initially flow through Karnataka. Subsequently these rivers flow through Andhra Pradesh and Tamilnadu and thereby establish an effective communication line linking Karnataka and the Bay of Bengal through southeast India. The fertile Raichur doab protrudes into western Andhra from Karnataka. The southern hills of Karnataka extend up to the lower Kaveri valley in the northern districts of Tamilnadu. Therefore by virtue of its location it is possible to categorize Karnataka, from the point of view of archaeology, as a cultural locus and also as an area of (cultural) diffusion.

Secondly, the Megalithic culture and the iron technology intruded into areas where the Mesolithic, the Neolithic and the Neolithic-Chalcolithic had persisted for some length of time.

Thirdly, the Megalithic culture received a strong impetus from the preceding Neolithic-Chalcolithic of the southern Deccan. At this stage it is imperative that we briefly sketch the Neolithic-Chalcolithic of the southern Deccan.

It is now held that the external impetus was largely responsible for the introduction of the Neolithic-Chalcolithic culture to the southern Deccan (Seshadri 1968:69:55-56; Sundara I97I:3I0; Nagaraju I973:75-77; Paddayya I973:82-87). It is also believed that the existing Mesolithic Culture in the southern Deccan integrated with

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I. The 'chalcolithic' element of this culture complex has been questioned. Some consider that the southern Deccan Neolithic-Chalcolithic indicates neither a full-fledged metal industry nor any alterations in the basic form of subsistence and the cultural pattern of Neolithic (V.N. Misra's comments in Thapar I965:94-95).
this new culture complex (Thapar 1965:93; Allchin 1974). The migration of the (Jorwe) Chalcolithic folk towards the southern Deccan seems to have been triggered off by a climatic change subsequently resulting in aridity around the upper Bhima-Godavari region (Dhavalikar 1973:143-144). The chalcolithic element apparently intruded into the uppermost Neolithic phase of the Krishna-Tungabhadra valleys by moving down the Bhima valley (Sundara 1968).

The primary cultural locus of the Neolithic-Chalcolithic complex flourished in the Bellary, Raichur and Shorapur areas (Krishnaswami 1960:49-50; Allchin 1960; Nagaraja Rao 1971; Paddayya 1973; Fig. 29). The presence of pastures near the hills, a good supply of water and also raw material for stone implements including the abundance of game in these areas made Karnataka and western Andhra attractive to the pastoral Neolithic-Chalcolithic communities (Subbarao 1947; Nagaraja Rao et Malhotra 1965:90; Sundara 1970:109; Paddayya 1973:75; Reddy 1976:114 ff.). From this locus the Neolithic-Chalcolithic spread to the south-west, south and the east. The southwest limit is marked by the type site at Hallur (Nagaraja Rao 1971). The southern most sites are found on the Kaveri valley (Foote 1916:57; Krishnamurty 1971:5) where T. Narasipur may be considered as the type site there (Seshadri 1971; Subbarao 1956-57:69). The eastern limits are marked by

1. It appears that the pure Neolithic had spread from the Bellary district to the eastern sea along the Krishna valley (Soundara Rajan 1958:III).

2. In Tamilnadu the pure neolithic implements have been found in the districts of Salem (IAR 1962-63:13), North Arcot (IAR 1964-65:223; 1967-68:26-30), South Arcot (IAR 1961-62:26), Coimbatore (IAR 1957-58:38; 1960-61:18) and Madurai (IAR 1960-61:18). Some traits have been reported even from Cannanore district, Kerala (John 1974:385). Moreover, at Malaiyampattu in North Arcot, the neolithic Black-slipped ware was found in association with the Megalithic BRW (IAR 1970-71:...
Kesarapalle (Sarkar 1966:46-47) and Nagarjunakonda (Soundara Rajan 1958; Subrahmanyan 1975:78-79) in the lower Krishna valley.

Radiocarbon dates from Utnur (Andhra Pradesh) and Kodekal (Karnataka) places the lower limit of the Deccan Neolithic around 2300 B.C. (Ramachandran 1975:i42, 73). Another series of radiocarbon dates from Sanganakallu, T. Narasipur, Tekkalakota, Terdal, Utnur (Ramachandran 1975:i23, I31-2, I34-5, I37, I42), Nagarjunakonda (Subrahmanyan 1975:213) assign an upper date of c. 1000 B.C. for the Neolithic-Chalcolithic (Paddayya 1971:136). The terminal date for the Neolithic-Chalcolithic at Hallur is 945 B.C. (Agrawal et Kusumgar 1968: I33-4). Apparently the Neolithic phase seems to have persisted in northern Tamilnadu until the 5th Cent. B.C. The overlapping period of the Neolithic and the Megalithic at Paiyyampalli is dated as 380±100 B.C. (IAR 1967-68:30). It is possible that Paiyyampalli may represent the final phase of the Neolithic in the northern peripheral areas of Tamilnadu.

There is some evidence to believe that the population and the economy underwent a relative expansion during the latter half of the Neolithic-Chalcolithic phase in the southern Deccan (Nagaraja Rao I971:i22; Allchin 1960:130; IAR 1967-68:3). While the nomadic pastoral economy (supplemented by hunting and subsistence farming) of the Neolithic persisted, some degree of semi sedentarization apparently was introduced during the Neolithic-Chalcolithic. The establishment of

Cont'd... p. 34). At Appukallu, North Arcot, the neolithic celts were associated with the Megalithic-BRH in the earliest levels of the habitation site (Mahalingam 1978:45 note).

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a rudimentary network of exchange (to obtain raw material and prestige goods) and semi specialization (in utilitarian and prestige items) appear to have improved in relative terms by the end of the Neolithic-Chalcolithic period (vide Chapter II for details on the economy).

The archaeology and the distribution pattern of the Neolithic/Neolithic-Chalcolithic in the southern Deccan must necessarily be viewed in terms of their relationship to the post Neolithic-Chalcolithic period. On the one hand, the southern Deccan Neolithic-Chalcolithic maintained cultural contacts with the contemporary cultures of northern and western Deccan (Paddayya 1973:82-3). On the other, the Neolithic-Chalcolithic intruded into Macro Zone I (western Andhra has over a dozen sites) where these sites became culturally linked to other Neolithic sites in the Primary Region. The Neolithic and the Neolithic-Chalcolithic in the southern Deccan exhibits a near uniformity in the cultural elements that spread over a relatively wide geographical area. We cannot therefore underestimate the impact of this phase on the Iron Age socio-cultural matrix which also intruded and diffused largely from Karnataka into the Primary Region.

II - ii

Research on the Megalithic-BRW culture (including our subsequent chapters) establishes that this culture made significant contributions and innovations to introduce elements of civilization in the Primary Region. These may be listed as: a basic metal technology i.e. iron, the potters wheel, the plough, paddy cultivation, dam and tank irrigation, a greater degree of craft specialization, the ability to harness the environment with greater efficiency, the establishment of new settlements and the definite beginnings of a sedentarized village culture, the
emergence of petty exchange centres and the relative expansion in the exchange network, prelude to a greater demographic expansion, the emergence of petty chieftaincies, the introduction of the horse, new burial types (megaliths) and pottery types (characteristic BRW, all black ware, red ware and the russet-coated painted ware).

These introductions and innovations appearing in the Primary Region have to be considered essentially within the context of time and space. The time factor approximately extends within a span of eight centuries (c. 1000 to 200 B.C.). In terms of space, the culture spread over a relatively wide geographical area (present Andhra Pradesh to Sri Lanka). This is because these communities or culture elements moved very gradually and began to discriminate between the nuclear and the peripheral areas only when there was a relative demographic expansion and more assured control over the environment of the lower alluvial plains.

There is still controversy over the route followed by the Iron Age Megalithic culture which entered the northwest Deccan. It is yet to be confirmed whether these elements moved along a land route from the Sakran area or came across the sea from the Gulf of Oman (Gordon 1950:65-67; Gupta 1970-71:4-16; Ramachandran 1969:59-65; Chakrabarti 1979:347-364). There is, however, a good deal of agreement on certain other factors related to this culture group in the northern Deccan i.e.: firstly that it was an intrusive culture, secondly it was amalgamated with the existing Chalcolithic cultures and thirdly, three distinct traits came to distinguish this culture after its initial period of arrival viz. the megalithic burials, the iron technology and the BRW. These aspects have been relatively well established and documented following a series of excavations in northern and western Deccan viz.
Somnath (Nanavati et Mehta 1971), Nagara (Mehta et Shah 1968), Bhokardan (Deo et Gupte 1974), Paunar (Deo et Dhavalikar 1968), Takalghat and Khapa (Deo 1970), Mahurjhari (Deo 1973). Our primary concern, however, is with southeast India, and, to begin with, let us mention a recent study made on the Megalithic culture in Karnataka (vide Sundara 1975).

According to Sundara's study two dominant groups of megalithic streams appear in Karnataka. The passage chamber tombs (not of local origin), seem to be the earliest megalithic group in the southern Deccan. These monuments are generally concentrated in western Karnataka. In the early stage these monuments had little chalcolithic admixture and a very small proportion of BRW. However, as this group moved further southwest i.e. to the upper Tungabhadra valley, the burials acquired more BRW and also chalcolithic affiliation (Sundara 1975:208, 215).

The indigenous group is represented by the pit burials and stone circles having urns. These are mainly concentrated in the Bellary area and in the doabs of Raichur and Shorapur. The parallel forms of these burials have been found in Chalcolithic Chandoli and Nevasa. Two decades ago Subbarao emphasised the significance of the similarity between the Chalcolithic B-R-W and the Megalithic BRW in relation to culture or community movement (1962:146). In the southern Deccan, these burial sites more often coincide with the preceding Neolithic-Chalcolithic sites and are relatively fewer where the latter are absent. According to Sundara, these burials may have originally belonged to the Neolithic-Chalcolithic folk who seem to have adapted the megalithic burial practices and also obtained the iron technology from the intruding passage chamber tomb group (Sundara op.cit. 164-166;

As for the settlement pattern, the two groups appear to have followed distinct geo-physical zones in Karnataka and in western Andhra. Generally, the passage chamber tombs are heavily concentrated in the hilly areas overlooking rivers. The pit burials and stone circles are generally located on the banks of the nullahs and the rivers, and often coincide with the previous Neolithic-Chalcolithic sites (Sundara op.cit. 215; 164).

Sundara also draws our attention to a significant archaeological feature related to these two groups. It appears that the graffiti bearing pottery are most common within the indigenous group of burials. On the contrary, there is an apparent non-occurrence of graffiti within the passage chamber tomb group. While the pure neolithic of the Krishna-Tungabhadra region does not possess graffiti bearing pottery, the latter begin to appear only with the chalcolithic intrusion to the southern Deccan (ibid. 173; 1976:169-175). In an independent study B.B. Lal clearly established the continuation of the Chalcolithic graffiti tradition to the Iron Age Megalithic MRW culture (1962:4-24).

The approximate date for the terminal Neolithic-Chalcolithic phase and for the beginning of the Iron Age in the southern Deccan has been assigned to 1000 B.C. (Supra p. ). The validity of the overlapping dates of these two cultures at Hallur viz. 870 B.C. and 1020 B.C. (Agrawal et Kusumgar 1968:133-4) has been questioned (Paddayya 1971:136, note; Ramachandran 1969-70:108-9). However, a third date from Hallur viz. 949 B.C. confirms the above terminal dates for the Neolithic

I. From the evidence unearthed at Brahmagiri it appears that the pit burials are larger and richer in burial goods as well as in iron implements than the cist burial group at that site (Sahni 1965:33, 36).

II – iii

In a recent study an attempt has been made, even in a limited way, to place the Megalithic-BRW culture of Andhra within a geographical context (Chatterjee 1976). This work, indicates the significance of the megalithic typology and its distribution pattern in relation to the ecological context, though it has also not fully taken into account the importance of the Megalithic cultural matrix in relation to the preceding Neolithic-Chalcolithic cultural background.

In a discussion of the megalithic distribution pattern in Macro Zone I and II one has to keep in mind the contiguous area i.e. Karnataka, an area geographically and culturally linked to Andhra and Tamilnadu. Earlier we had mentioned that the Neolithic and the Neolithic-Chalcolithic cultures intruded from Karnataka and spread along the Krishna basin to the eastern coast (Sundara 1971a:21; Soundara Rajan 1958:93; Sarkar 1966). The distribution pattern of the iron using Megalithic-BRW culture also followed the identical routes from Karnataka to coastal Andhra.

The distribution pattern of the Iron Age Megalithic burial and BRW habitation sites in Macro Zone I reveal two primary groups viz. firstly southwest Andhra (western Rayalaseema) and secondly, the eastern plains (lower Krishna and Godavari plains). This distribution pattern of the

I. The district breakup is as follows: (Rayalaseema) Kurnool, Anantapur, Cuddapah, Chittoor. (Telengana) Adilabad, Karimnagar, Nizamabad, Warangal, Sangareddipet, Hyderabad, Nizamabad, Karimnagar, Khammam. (Eastern Coast) Srikakulam, Visakhapatnam, E. Godavari, W. Godavari, Krishna, Guntur, Nellore.
Proto Historic culture sites is due to the topographical unevenness resulting in a variegated landscape. This topographical unevenness is primarily caused by the 'Eastern Ghats' which largely separates the western elevated area from the coastal plains, and to a lesser extent by the major rivers (Godavari, Krishna-Tungabhadra and the Pennar). Both factors have in turn determined the 'status' of the ecological zones (i.e. nuclear or peripheral areas) in relation to the settlement pattern of the Proto and Early Historic cultures.

To ascertain the routes of cultural diffusion into Macro Zone I and the area that initiated institutional development, we have to locate the archaeological evidence within a geographical context. Let us first consider the case of western Rayalaseema. Here the Proto Historic remains are primarily concentrated within the districts of Kurnool and Anantapur and are found mainly along the upper reaches of the Pennar and its tributaries within these two districts. Within these two districts there are over forty five Neolithic/Neolithic-Chalcolithic sites and some are associated with ash mounds (IAR 1965-66;2; Paddayya 1973:map of neolithic sites; Reddy 1976:132; Table 7). It is, therefore, not surprising to find the same area being used as an occupational zone by the intruding iron using culture.

The dominant varieties in western Rayalaseema are dolmenoid cists, cists (port hole/sarcophagi), cairn circles and stone circles. The distribution pattern in this area seems to have been determined to a large extent by the ecological factor.

A greater portion of western Rayalaseema has a general altitude of

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1. In Kurnool, some of the Neolithic-Chalcolithic settlements seem to have moved away from rock shelters and hill terraces to open-air settlements near small streams (IAR 1967-68:3-4).
1000-2000 ft. above sea level with extremely uneven topographical features. Further, the limited rainfall, which is also relatively uncertain, places this area within the semi-arid and arid bio-climatic region. The soil regions in Rayalaseema mainly fall within the Red and Black soil types. These require regular irrigation and are more suited for dry crops such as jowar (sorghum vulgare), rāgī (finger millet/eleusine coracana) and bājrā (bulrush millet/pennisetum typhoides). Considering the soil and climatic conditions, the vegetation in this area is poor (Gangi Reddi 1977:44). Jowar is known to be 'a hardy plant which can be grown on lesser soils than wheat, tolerates heat well and is modest in moisture requirement' (Leshnik 1973:72). Patches of river alluvium form extremely narrow strips of fertile land along the water courses running through the highlands. In addition, routes along river banks are useful communication lines linking the peripheral and the nuclear areas for exchange purposes and community movement. The latter aspect is linked to the nature of the mineral resources in this area. Western Anantapur area is rich in gold, iron ore, quartz and diamond (WI 1956:iv.161; 1959:v.259; 1962:vi.102; Reddy 1976:9-10).

The early Iron Age sites seem to have spread into this area for

1. Rainfall for 1960-61:
   Anantapur 51.0 cms.
   Kurnool 59.6 cms.
   (CI 1961, Vol. II Pt. IA(i)).

2. For 1960-61, the % of the sown area for major crops in Anantapur and Kurnool:
   Anantapur—rice (5.2), jowar (20.4), bajra (8.0), ragi (6.1).
   Kurnool—do. (4.8), do. (28.5), do. (2.8), do. (6.9).
   In both districts the major crop is jowar. (Reddy 1977:50).

3. It is reported that diamonds are picked up after heavy rains by the villagers. Vajrakarur is an important diamond producing centre (Thurston 1913:71). Ancient important diamond workings have been found at Banganepalle, Dhoni, Virajpalli etc. in Kurnool (Shukla 1972:17).
several reasons. The existence of the Neolithic/Neolithic-Chalcolithic communities who operated within a pastoral cum subsistence agricultural economy made the natural selection of the dwelling sites more convenient e.g. Kalamedavur hill in the Anantapur district is a site where the neolithic settlement was succeeded by the Iron Age culture (Guraja Rao 1972:185). The discovery of iron slag in association with the Iron Age site at Kalamedavur hill is significant (Satyanarayana 1975:36). The availability of gold and iron with ease may have been an important consideration for the location of these sites in western Rayalaseema. It appears that the existing ecological zone suited the early megalithic communities in this area. As long as there was not a considerable demographic expansion, it did not create pressure on resources i.e. cultivable land and pastures along the narrow alluvial valleys and on raw material. The existing economy, therefore, was sufficient to sustain the early Iron Age population in this area.

The movement of this culture to the lower plains (judging by the distribution of sites) seems to have taken place mainly along the Krishna, Godavari and the Pennar. In any case a large scale colonization of the lower alluvial plains was possible only when there was a demographic expansion, a more efficient use of the iron technology and with the

I. Deposits of high grade haematite which is located in ferruginous quartizes are found in the Rayadrug taluk of Anantapur. Iron ore is also easily procured by washing the sand in the nullahs of Dharmavaram, Kalyandrug and in Rayadrug of Anantapur. In fact local furnaces serving the surrounding villages operated until the late 1880's in this area (APDG Anantapur 1970:23; Watt 1972:iv. 507). The haematite deposits of Anantapur extend east to the Cudappah district (APDG. Cudappah 1967:27). North of Anantapur some of the best haematite ore are located in Kurnool at Ramallakota and in the Gani hills (NI 1959:v. 259; IGI 1908:xvi. 39). Large scale local smelting for the manufacture of agricultural implements was done in the Kurnool district until the early 20th Cent. (ibid.).
ability to control the riverine environment to cultivate a high yield-
ing crop such as paddy at an extensive scale. It was only after some
time following this movement to the riverine plains that recognizable
traits of institutional development really began to take shape during
the latter phase of the Proto Historic period, but more specifically
in the Early Historic period.

The Megalithic-BRW remains of the eastern plains are primarily
consolidated in the Krishna-Guntur and in the Ongole districts i.e.
the lower Krishna basin. In archaeological terms, there are three
significant features that emerge in relation to this group. Firstly,
the lower Krishna basin has a relatively larger number of Megalithic-
BRW sites (approximately 30 odd sites within the three districts) than
other areas of Macro Zone I. Secondly, the urn burials, cairn circles,
pit burials, stone circles dominate in number over the cist and dolmen
types. Thirdly, at a good number of Megalithic-BRW sites there is an
occurrence of associated archaeological remains belonging to the
subsequent Early Historic period of Andhra. It is necessary then to
view these factors within a geo-cultural context.

The topography of the eastern coast is in sharp contrast to the
western elevated land. The 'Eastern Ghats' virtually disappear leaving
an extensive lowland area. Consequently the coastal districts are
neatly encapsulated by the hill ranges of Velikonda, Nallamalai and
Rampa. With an elevation less than 100 ft. above sea level, a
perennial supply of water from the Godavari, Krishna and the Pennar
in their lowest (depository) state, the eastern plains have the
richest alluvial soil and an assured supply of water in addition to
the rain from both monsoons. The close proximity of both also resulted
in one large homogeneous delta region i.e. the Krishna-Godavari delta,
which became significant to the settlement pattern, more specifically from the Early Historic period and after. It is precisely this geographical background augmenting a demographic growth, and increased production i.e. the potential for development, that made Subbarao categorize this region as the primary nuclear area in Andhra (1947-48:168).

However, within this nuclear area the Krishna basin appears to be a core area due to certain advantages it has over the Godavari lower plain. Though the primary delta areas of both rivers get an annual rainfall of over 100 ins. (CI Andhra 1961) and are characterized by swamps and sand dunes, the lower Godavari has a greater growth of dense forests. Moreover, the lower Krishna basin is more extensive and spread inland to a relatively larger extent than the Godavari plain. A larger portion of the lower Krishna plain being located inland means that it is relatively less exposed to the vicissitudes of high rainfall, the hazards of deltaic floods, swampy conditions and salination. All these disadvantages may account for the low occurrence of Proto Historic sites in the littoral or the Krishna and the absence of such sites on the deltaic area of the Godavari.

The Krishna river also had an additional advantage of many tributaries flowing through the flood plain where the surrounding hills bearing raw materials are linked to the lower alluvial plain and ultimately to the Bay of Bengal. Though both rivers (Krishna and Godavari) are, up to a point, navigable throughout the year (RIC 1972: 187), the greater advantage to the Krishna lower plains was the network of tributaries. The Megalithic-BRW sites as well as Early Historic

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I. Country boats and small steamers (upto 30 tons capacity) can normally travel about 35 k.m. upriver and a further distance of 64 k.m. during the monsoon (July-Nov.).
sites viz. Chantasala, Amaravati, Dhanyakataka, Nagarjunakonda, Yelleshwaram, Jagayyapetta, Goli, Bhattiprolu, Cerzala, Gundivada etc. were all linked to each other by this 'grand water system' (Ray I965: I3), where the water ways played a crucial role in the communication network during the formative period and after.¹

The primary soil types that are found within the districts of the nuclear area are mainly, the deltaic alluvium, coastal alluvium and a few patches of Black soil and Red soil.² The alluvium in this area can be easily worked due to its being less gritty and chemically extremely suitable for intensive cultivation especially for high yielding crops such as paddy.³

This nuclear area also has certain raw materials crucial for the economy. There are copper deposits found in Nalgonda, Nellore and Guntur (CI Andhra Pradesh I96I:II, pt. ix. APDG. Anantapur I970:23; APDG. Guntur I970:23; APDG. Nellore I970:23; APDG. Nalgonda I970:23).

I. It is possible that the Krishna may have carried a larger volume of water and was more navigable than at present. The advancing coastline is indicative of a larger density of river sediments flowing down and the silt that is accumulating in the delta area. The perpetual stream of water that was associated with the Megalithic-BRWH habitation site at Kesarapalle is almost a dried out nullah today (Sarkar I966:38, 48). Maloney very correctly points out that the coast may have been very much closer to Bhattiprolu during the pre-Christian times than it is today (I968:155). Similarly the early historical port at Uppagundur is about five miles inland at present on the bank of a lake (Chhabra I959-60:189-190).

2. If irrigation facilities are used, the Red soil also can be productive. The relative moisture retentive character of the Black soil makes it more suitable for cotton and even crops such as jowar and bājrā.

3. According to the Season and Crop Report I960-6I (vide Reddy I977: 50) there is a progressive decline in the area under paddy cultivation in Andhra as one moves south of the Krishna-Godavari rivers, i.e. E/W Godavari, Krishna 60-70%, Guntur, Nellore, Chittoor, Cudapah I5-30%. Incidentally the Chittoor district conducts intensive cultivation under well irrigation (ibid. 44) and Nellore mainly under tank irrigation (Spate et Learmonth I972:738).
Subrahmanian I932:I33; TA I881-82:I063; Foote I916:I29). Ancient mines and the remains of malachite and azurite have been observed at certain localities in the districts of Nellore and Guntur. Foote reported the occurrence of Early Iron Age pottery in association with the copper mines near the river Krishna in the Guntur District (ibid.). Considerable quantities of limonite, haematite and magnetite iron ore deposits also occur in the Godavari, Guntur and Nellore districts (WI I959:v. 259; Watt I972:iv. 507). However, the most significant deposits of iron ore are located in the Ongole group of Guntur and the Gundalakamma group in Ongole, where surface extraction of the ore is relatively easy (WI I959:v. 259). The occurrence of a series of megalithic sites in western Guntur and Ongole on the slightly elevated areas mainly along the Gundalakamma river may have some degree of relationship to the easily extractable surface ores in this area. The eastern coastal plains also have several places where diamonds are found, especially along the lower Krishna river. The Krishna-Guntur districts do yield traces of several centres of ancient diamond workings (Shukla I972:I3 ff.). We may take note of the location of Dhanyakataka, a BRW habitation site, in proximity to the diamond mines found on the opposite bank of the river (cf. Burgess I882/I970:plate III). The eastern districts are also famous for the production of high quality garnet (WI I956:iv. I44; Shukla op.cit. 27-28). The extensive veins of limestone on either side of the Krishna river (WI I962:vi. I02) proved to be extremely useful as building material during the Early Historic period that gave rise to a distinct tradition of sculptural art in this region.

I. The specimens from Nellor showed about 75% copper content.
It appears that specific ecological factors provided the initial basis for the distribution pattern of the Proto Historic sites mainly focused on the lower Krishna basin which went to form the matrix of the Early Historic culture in the eastern plains.

Finally we may also take note of some dispersed groups of Megalithic-BRW sites in north west Andhra (western Telengana). These sites are located within the southern Medak and the Hyderabad districts and also sparsely distributed along the lower Godavari upto the Khammam district. The major burial types once again are the dolmenoid cists, cists, cairn circles and stone circles.

It is clear that these groups are extensions from southern Maharashtra and eastern Karnataka. The link to the former area is clearly seen by the existence of BRW habitation sites such as Haradolala Tekadi, adjoining Pauni on a tributary of the Godavari (Deo et Joshi I972:62) being directly in line with large megalithic-BRW sites at Kadambapur (IAR I974-75:3-4) and Peddabankur (IAR I968-69:1-2; I97I-72:2-3; I974-75:5) on the banks of the main river in the Karimnagar district. The Black soil and the river alluvium no doubt played a significant role in enhancing the richness of the natural region, which is evident by the extent and the relative prosperity of the BRW habitation sites at Kadambapur, Peddabankur and Dhulikatta (IAR I974-75:3; I975-76:2). It is possible that at Dhulikatta a fortified settlement may have existed as early as the 3rd Cent. B.C. (IAR I975-76:2). In addition, along the banks of the Godavari in Telangana (especially in the Karimnagar district) there is a profuse occurrence of iron ore which is easily extractable (IGI I908:xii,8). There is evidence at Peddabankur that in the pre Sātavāhana and Sātavāhana period this site was used for iron smelting and had a forging
'factory' (IAR 1971-72:2-3; I974-75:5). Therefore, judging by the burial types occurring in southern Maharashtra and northern Telangana, including the above mentioned archaeological evidence, the movement of this culture into the Macro Zone I and the link this area forged to join southern Maharashtra and the lower Krishna, is a significant aspect related to its locational character.

One may gauge the significance of the sites in Hyderabad and southern Medak districts in relation to the foregoing. These sites appear to be located in the middle of a route linking southern Maharashtra and the Raichur doab which apparently fell via the Karimnagar district. A second route from western Deccan seems to have passed through eastern Karnataka and the Hyderabad area to reach the lower Krishna plains. The development of centres such as Kondapur (Medak district) during the Early Historic period (Yazdani 1941:171-185) may be viewed in relation to this communication linkage of extended regions with the Primary Region.

The limited archaeological work in an intensive scale on the Megalithic culture of Macro Zone I does not permit us to speak of an absolute chronology for this area. However, on the basis of the available evidence we may consider chronological phases by working backwards in time and space.

A few systematic excavations in the lower Krishna valley have
yielded stratigraphic evidence from select sites. At Kesarapalle the excavations revealed a neolithic-chalcolithic and BRW admixture at the lowest level of the habitation (Sarkar 1966:43-44). Dhānyakaṭaka (Dharnikota) yielded a pure BRW stratum at the lowest level of the habitation site (IAR 1958-59:5; 1962-63:1-2). An admixture of BRW and Northern Black Polished Ware (NBPW) was discovered at the lowest level of the Mahāstūpa at Amaravati (Sarma 1975:60-62).

For the purpose of dating, this stratigraphical evidence proves to be extremely useful. Though the Neolithic-Chalcolithic culture seems to terminate in Karnataka and western Andhra around 1000 B.C., it may have lingered on in the eastern plains for some time until the iron using people amalgamated with them. This is seen by the admixture of the Neolithic-Chalcolithic layer with the BRW at Kesarapalle (Sarkar op.cit.). However, it is significant that at Kesarapalle between the layers where this Neolithic-Chalcolithic admixture takes place and the occurrence of the NBPW sherds, there is a 2mt. thick layer of pure BRW (ibid).

It is certain that the Mauryan contact definitely existed in the lower Krishna by c. 250 B.C. (infra). Yet, the NBPW had every chance of reaching the lower Deccan during a pre-Mauryan or at least a pre-Asokan date. Recent studies on several sites in Maharashtra and Malwa indicate the occurrence of the NBPW at least by c. 450 B.C. (for an integrated version of archaeological and C-14 data cf. Deo et Joshi 1972:61-62). The 1974 excavation at Amaravati posed the same question in relation to layer I3 or Period IA represented by the BRW-NBPW admixture which is supposed to be pre-Asokan (Sarma op.cit. 62). Even the C-14 dates from Dharnikota and Amaravati seem to strengthen this view. Two dates from the former site indicate (2355±95) 405 B.C. and

Thus if we consider c. 350-250 B.C. as the latest date for the arrival of the NBPW, then the earliest occurrence and the period of accumulation (such as 2 mt. at Kesapalle) of the Megalithic-BRW may be pushed back at least two centuries anterior to the 4th Cent. B.C. In this context the discovery of urn burials 7 ft. below a minor stūpa adjacent to the Mahāstūpa at Amaravati is significant (Rea 1908-9:90). If this subsidiary stūpa (which is said to be coeval with the original Mahāstūpa) was built by the resident community ignorant of the existence of the urn burial ground, there may have been a time lag between the stūpa construction and the burials, which may be represented by the 7 ft. gap between the burials and the foundations of the stūpa.

Considering the above evidence, the arrival of the iron using megalithic communities in the lower Krishna may have been approximately c. 6th Cent. B.C. the latest (Sarkar 1969:26). If these communities appeared in Karnataka around 1000 B.C., a gradual eastward drift along river banks discovering sources of essential raw material and suitable habitation/pastoral ground and in the meantime harnessing the riverine environment, may have taken a minimum of 4-5 Centuries. Thus we arrive at the period of c. 6th Cent. B.C. which seems to agree with the archaeological evidence. After their arrival it may have taken at least

I. From a slightly later context, a similar situation was revealed at Yelleshwararum. The stūpa complex and the non Buddhist religious structures were constructed on a megalithic burial ground, where the latter was generally below 2 mt. from the surface level (Khan 1963:4-9). During the Historic period the Buddhist structures were the earliest and have been dated to 1st Cent. A.D. (ibid. II). This may provide these megaliths with a pre-Christian date.
another two centuries to initiate a surplus production and certain institutional developments in the core area where the historic period in the lower Krishna develops around c. 400/300 B.C.

The iron using Megalithic-BRW culture intruding from southern and northern Karnataka and also from southern Maharashtra (Vidharba of Early Historic period) seems to have blended with the necessary geographical areas depending on ecological factors. The major river valleys, more specifically the Krishna and the lower Pennar, held a greater number of sites which continued into the Early Historic period. By the Early Historic period the Krishna lower valley turns out to be the primary nuclear (core) area and the Pennar, western Telengana and north east Andhra (E. Godavari, Visakhapatnam and Srikakulam) the auxiliary areas to the primary nucleus. Similarly the hilly and the infertile zones generally surrounding the fertile tracts, remained as 'areas of isolation' (Subbarao I958:141-144) and peripheral areas, where they continued to be economically and socially backward throughout history (Furer-Haimendorf I943: I948:87-90).

Through this process of uneven geographical distribution as well as an unevenly developed Proto Historic cultural matrix in Macro Zone I and the subsequent interaction (between the horizontal centripetal force and the vertical centrifugal force) during the Early Historic period resulted in the gradual development of cultural, linguistic and political institutions with some form of individuality within the primary nucleus and in its auxiliary areas.

III - 1

The overall topography of Macro Zone II i.e. Tamilnadu, is not very
Map No. I

The probable migratory route of the Megalithic-BRW culture in Tamilnadu.
different from Macro Zone I. The extensions from the western Ghats and the 'eastern Ghats' such as the Shevaroy hills, the Nilgiris, Anaimalai, Palani hills, the Elamalai, Agastiyamalai and the Mahendragiri neatly encloses the riverine and coastal plains of the east. Accordingly the general topography reveals a relatively clear demarcation between the elevated highland area in the west and the lowland plains in the east. Due to these hills, the lower plains evolved by the major river system stand out as fertile pockets, which is a significant feature in the landscape of this region.

We may also identify certain general features related to the basic distribution pattern of the Megalithic-BRW culture in Tamilnadu. Firstly, there is a concentration of sites mainly in the highland areas. Secondly, in the highland areas, the sites are located on the banks of the major rivers and their tributaries flowing eastward through the mountain passes to the Bay of Bengal and the Gulf of Mannar. Thirdly, in the lower plains, the sites are near perennial/seasonal rivers or adjacent to irrigation tanks. Fourthly, there is a tendency for the

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1. There are approximately 325 sites listed within the present boundaries of Tamilnadu. We have been able to locate only 250 odd sites and this is due to certain practical difficulties associated with the recording. Certain site locations are not accurate and these appear in incomplete reports. There have also been instances where the names of sites overlap with a previous report and two different people giving the names of two different villages that are nearest to a particular site. In other cases the name of a site may change with the shifting taluk/district/state boundaries. For example it is stated that there are 200 odd sites in Chengleput district (Sirinivasan et Banerjee 1953:105). Either these sites have not been recorded so far or they may be clusters named after a major site in each place.

2. Over 2/3 of the sites are located in areas under 1500 mt. The site break up indicates;

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Sites</th>
</tr>
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<tbody>
<tr>
<td>0 mt.-30 mt.-littoral and hinterland</td>
<td>34 sites</td>
</tr>
<tr>
<td>30 mt.-400 mt.-low-plain</td>
<td>179 do.</td>
</tr>
<tr>
<td>400 mt.-1500mt.-mid-uplands</td>
<td>81 do.</td>
</tr>
<tr>
<td>above -1500mt.-Highlands</td>
<td>22 do.</td>
</tr>
</tbody>
</table>
urn/cairns/stone circles/pit burials to be generally associated with areas more suitable for paddy cultivation. Finally, the megalithic sites in Macro Zone II are greater in number and wider in variety than those in Macro Zone I.

The geographical contiguity of the southern Deccan to the Macro Zone II, witnessed the movement of the Megalithic-BRH culture elements beyond southern Karnataka. The diffusion of the iron using Megalithic-BRH culture extended southward not only towards Tamilnadu but also in a south western direction to enter Kerala. With the exception of the northern fringes, the Megalithic-BRH culture folk introduced the use of metal, sedentarized village dwelling, a pastoral cum subsistence agricultural economy, and the use of pottery during the Proto Historic period to the Macro Zone II. Here too this culture founded new habitation sites and brought new areas under settlement by harnessing the environment and thus laid the basis for the beginnings of civilization in south India.

We may be able to notice a particular order related to the distribution pattern of the Proto Historic sites within the two major topographical features i.e. the surrounding highland areas and the lower riverine plains.

Taking into account the highland areas first, we may notice the

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I. The rock-cut caves in Kerala according to Ramachandran were an introduction by groups arriving from the Arabian coast (1969:59-65). However the overwhelming amount of cultural evidence points to an introduction of the iron using BRH culture and the associated burial types from southern Karnataka (Codrington 1930; Thapar 1952; Sharma 1956;110-113; Krishna Iyer 1967; Sundara 1975:215). The movement of communities from Karnataka to the south and the interaction between Kerala and Tamilnadu as residential areas is frequently mentioned in the traditions of the hill tribes in Kerala. They often trace their original home to the districts of Madurai, Coimbatore and Tirunelveli and also to Karnataka (Krishna Iyer 1968:13-19).
concentration of sites at particular points, namely, the northern hills (Dharmapuri, Salem, North Arcot districts), Nilgiri-Kongunadu uplands, Palani hills and Agastiyamalai.

The megaliths in the Dharmapuri-North Arcot districts are an extension of the southern Karnataka group. The Bangalore-Kolar districts literally contain thousands of megalithic burials (Gururaja Rao 1972:137-145) which are seemingly in proximity to the gold producing areas. These areas not only have a wide range of burial types, but are often mixed varieties viz. stone circles surrounding dolmenoid cists, stone circles surrounding cists, cairn circles (some having sarcophagi), urn burials etc. e.g. Jadigenahalli (Seshadri 1960).

The distribution pattern of the Proto Historic sites in this area has specific features viz. firstly, the sites are predominantly located on the banks of the upper Kaveri and its tributaries including the banks of the Palar and the Ponniyar. The upper sections of all these rivers are linked to the southern Deccan (southern Karnataka). Secondly, a relatively high number of sites are concentrated on the northern hills, especially in the Dharmapuri and Salem districts.


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I. Explorations in southern Mysore along the Kaveri revealed 106 megalithic sites only within 6 taluks. With the exception of Hemmige, the rest of the sites have the megalithic culture overlapping the Neolithic-Chalcolithic
stratified excavations have only been conducted at T. Narasipur (Seshadri 1971a; Allchin B. 1966:58-63) which is an extensive BRW habitation site overlying the preceding Neolithic-Chalcolithic culture. Explorations in the upper Kaveri also revealed that almost all the Neolithic-Chalcolithic cum Megalithic-BRW sites are situated on the alluvial strips of the upper Kaveri and its tributaries.

From this locus, the Proto Historic settlements seem to move southward (mainly Salem district) and to the eastern coast (south Arcot and Chingleput) along the banks of the rivers. Foote reports very rich and large Iron Age graves from the western Shevaroy hills of Salem (Foote 1916:61-62). The dominant varieties are the stone circles and the dolmenoid cists (Gururaja Rao 1972:115-116). In north Arcot a significant feature is the existence of a pure Neolithic culture with the intrusive BRW culture subsequently overlapping the former. At Mallappadi near north Arcot district but located in Dharmapuri, the Megalithic succeeds the Neolithic culture (Raman 1978:124). At Boganapalli and Gollapalli in Dharmapuri, Neolithic celts and burnished grey ware were found with BRW (IAR 1964-65:22). Paiyyampalli is another neolithic habitation site with an overlap of the BRW culture with its associated burial site (IAR 1964-65:22-23; 1967-68:26-30). The major types in this area are port-holed cists/cists, dolmenoid cists, urns and dolmens with stone circles and these sites are generally restricted to the

<table>
<thead>
<tr>
<th>Nature of</th>
<th>T. Narasi-</th>
<th>Chandra-</th>
<th>Yelandur</th>
<th>Kollegal</th>
<th>Gundel-</th>
<th>Nanjanagad</th>
</tr>
</thead>
<tbody>
<tr>
<td>site</td>
<td>pur</td>
<td>rajanagar</td>
<td></td>
<td></td>
<td>pet</td>
<td></td>
</tr>
<tr>
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<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Neolithic</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habitation(Meg)4</td>
<td>5</td>
<td>9</td>
<td>15</td>
<td>6</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>Burial (Meg.)</td>
<td>-</td>
<td>22</td>
<td>7</td>
<td>45</td>
<td>24</td>
<td>3</td>
</tr>
</tbody>
</table>

(Krishnamurty op.cit. 5)

The topography of the Salem district extending to north Arcot via Dharmapuri reflects an obvious unevenness in the terrain. As one moves further north of the Kaveri, the land area progressively rises to over 6000 ft. With the exception of the narrow strips of alluvial soil along the river banks, the Red soil dominates this area (RTC 1972:III. 308). Wells are the primary source of irrigation but they are incapable of catering to or developing the agricultural requirements of a large population. Consequently Dharmapuri and Salem have been categorized within the dry-farming area of Tamilnadu (Palanivelu 1974:69). Paddy is not evident at the cultural levels of the Iron Age site at Paiyyampalli. There are remnants of dry crops such as kulti (horse gram/dolichos biflorus), green gram (phaseolus radiatus) and probably rägi (IAR 1964-65:22-23). In fact an increased amount of village settlements having tank irrigation along the low lands closer to the Kaveri appeared only during the post 900 A.D. period (Murton 1973:59). Cereals and pulses in this area cover an acreage for greater than that under paddy (MDG. Salem I918:1.205). The coincidence of Proto Historic sites along alluvial strips is, therefore, not surprising.

Dharmapuri and Salem, however, have a fair number of sites on the lower hills. In addition to the cultivable land, fertile soil and water in the lower hills, it is possible that this location may have
been determined to some extent by the proximity of raw material. The Salem area in fact has the distinction of possessing the maximum variety and the largest deposits of minerals in Macro Zone II (MDG. Salem. 1918;I, 31-35, 272-276). The lower hills contain some of the best (and large) deposits of magnetite ore (MT 1959;v. 265). Mica, steatite, garnet, Beryl are some of the other useful minerals found in this area (MDG. Salem. op.cit. 33-35). The Iron Age site at Paiyyampalli in North Arcot yielded evidence for iron smelting and gold workings (IAR 1964-65:23; 1967-68:27-28).

Two major streams of megalithic groups appear in the Nilgiri-Kongunadu upland in western Tamilnadu. The urn burials seem to spread along the banks of the Moyar valley and arrive at the Bhavani valley. A second type, mainly of the dolmen and cist variety, spread along the Palghat to the upper reaches of the Bhavani valley. A sub group of the latter also moved along the banks of the Moyyal (seasonal at present) into the arid Coimbatore district. In addition to these burials, there are thousands of cairns in the more elevated areas of the Nilgiri hills (vide Congreve 1844:77-I46). The affinity of most burials here to the Proto Historic BRW culture has been frequently questioned. Scholars prefer to assign an early Christian date (Das 1957:152) or even a later date as c. 3-500 A.D. (Leshnik 1970:99). The third major stream moving towards the Kongunadu uplands is from the south, where the dolmens and urn burials indicate a north east drift along the Palani hills. Though the urns are not much in evidence the

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1. Some of these deposits are 50'-IOOft.thick (Matt 1972;iv.507). These deposits are visible to the naked eye and could be easily extracted from the rock (MDG Salem 1918;I,3I). Local smelters utilized these ores until the early 20th Cent. (ibid. 272).

2. The upper reaches of the Amaravati (in Kerala at present) have a heavy concentration of dolmens, where they appear along the Cardamom hills
dolmens extend along the Kodawananar to the banks of the Amaravati which in turn joins the Kaveri. It appears that this group moved eastward to the plains of Pudukottai.

The topography of the Nilgiri-Kongunadu uplands shows an extreme unevenness of terrain. While the Nilgiris rise with extreme abruptness, the Coimbatore district itself has an uneven terrain (which is 500-1500 ft.). Its annual rainfall (average of 718.4 mm.) is the lowest rainfall count in Tamilnadu (SHET 1977:39, Table 2-4), and is insufficient to maintain the moisture content in the Black and Red soils in this area. The seasonal character of rivers and the uneven terrain do not encourage a regular reservoir system. It is therefore not unusual then to find this area classified under the dry farming zone of Tamilnadu (Palanivelu op.cit. 69). Well irrigation is largely practiced in this area which supplements plot cultivation where dry crops (cotton, horse gram, garlic, gingelly or sesamum orientale, cholam, chillies, wheat, millet) are grown in greater quantities than paddy (Ratnam 1966:75-78). Paddy cultivation is mainly along the alluvial soil of the rivers especially the Noyar and the Bhavani, and it is not surprising that the urn burials coincide with these areas. Grain that looks like paddy has been reported from a four legged jar in the upper Bhavani (Gururaja Rao 1972:96).

There seems to have been three major factors responsible for the relatively high concentration of sites in this area. The location of this area was extremely significant. Routes connecting southern

Cont'd from p., and then turn west to Kerala (Krishna Iyer 1967:17-19).

I. Latest statistics indicate only 12.8% of the acreage for paddy as against 32.6% of the acreage for other grains (SHET 1977:96-97. Table 5.6).
Karnataka with Kerala and the lower Kaveri had to pass this region either through the Gazalhatti or the Palghat gaps. The latter also linked the Arabian sea with the Bay of Bengal. The second factor is the environment ideal for pastoral cum subsistence agriculture. Excellent pasture lands are found in the Nilgiris and in western Coimbatore. This environment would also have been ideal for the early Proto Historic groups who operated within a pastoral cum subsistence agricultural economy before moving into the riverine plains.\(^1\) The proximity of raw material may be listed as the third factor related to this aspect. North of the Bhavani there are gold veins and mica is found in the eastern taluks of Coimbatore. In the latter area iron ore can be extracted from the black sand (\textit{Watt. op. cit.} 505). According to Sanford, in the vicinity of a large dolmenoid cist burial site near Mangalam station (Paliadam taluk, Coimbatore), the whole area was strewn with iron slag. He also mentions the rich iron ore deposits in the surrounding area (I90I:461-471). The beryl mines located at Padiyur in the Dharmapuram taluk may have been known since pre-Christian times (\textit{Warmington I974:250-251}).

The northern hills and the Nilgiri-Kongunadu uplands may be classified as areas of relative isolation and areas of isolation (retreat areas). In topographical terms these areas surround the primary broad alluvial plain i.e. the lower Kaveri valley of Macro Zone II. Hence they are peripheral areas to the primary nuclear area in this zone. Yet how can one account for the occurrence of a relatively high number of sites (in clusters or dispersed) in these peripheral

\(^1\) For Nilgiris as a pastoral area and Coimbatore as a major cattle breeding cum pastoral area vide Rivers (I906/I967) and Swaminatha Iyer (I927).
It is possible that this distribution pattern may validate one of two reasons: it may indicate the movement of relatively large groups of people (perhaps in several waves) who by-passed this area rather rapidly; alternatively it may indicate an occupation of the highland areas by the iron using communities for a considerable length of time, prior to a gradual drift towards the alluvial plains and the coastal areas. The latter seems to be a greater probability if we consider this aspect in the light of the Proto Historic economic pattern in south India.

The lowland area surrounded by the northern hills and the Nilgiri-Kongunadu uplands may be broadly categorized as the lower Kaveri valley and its auxiliary area i.e. north east Tamilnadu (north Tiruchirapalli, South Arcot, Chingleput).

The megalithic sites along the lower Kaveri are necessarily vestiges of communities that moved into the lower valley from the north (along the upper Kaveri via Salem district), from the west (across the Kongunadu upland), from the southwest (along the Palani hills) and the south (from southern Tamilnadu). With the exception of the southern group, the Megalithic-BR W sites arriving from the other areas are essentially located along the banks of larger rivers and their tributaries, linking up with the Kaveri lower plains.

What is the ecological basis of this distribution pattern? Let us consider the lower Kaveri plain first. The area between the Karur junction (Amaravati-Kaveri confluence) and modern Tiruchirapalli town emerges as the most important locus in western Tiruchirapalli district.

I. These may even belong to nomadic groups who periodically visited their traditional clan or tribal burial grounds to perform last rites associated with the deceased members or even to perform certain ceremonies associated with the tribal ancestors.
as it contains a high density of Proto-Historic sites. The dominant varieties of burials in this area are the urn burials and the cairn circles, some enclosing dolmenoid cists (Gururaja Rao 1971:202-203).

The topography of the lower plains of the Kaveri becomes more evident from the Karur area in western Tiruchirapalli. The alluvium in this area, however, is mainly restricted to the banks on either side of the river until it bifurcates (as the Coleroon) slightly east of the modern Tiruchirapalli town, in the Tanjore district. The restricted river alluvium is then a significant feature in western Tiruchirapalli.

The second is the advantage of western Tiruchirapalli which is in a convenient position to exercise hydraulic control. The Kaveri carries a large volume of water to the Bay of Bengal due to its origins from the heavy rainfall zone in the Brahmagiri hills. Yet, this flow cannot be harnessed for any purposeful irrigation until the river reaches Karur (Ratnam 1966:76). Thus the terrain and the ability to control the river in this area provide another advantage to western Tiruchirapalli.

How does the archaeological data support these features? As we mentioned above, between Karur and Tiruchirapalli there is a high density of sites. Let us consider some prominent sites. At Karur itself excavations yielded BRW (some having graffiti) from the habitation site (Champakalakshmi 1975-76:III). The strategic location of this site controlling the entrances to the Kaveri plains and the junction for several routes may have obviously prompted the early Chēras to have their capital at Karūr/ Vañji (Pilley 1975:289; Champakalakshmi op.cit.). Further east (14 miles) on the banks of the Kaveri a large cluster of BRW habitation sites with associated (mainly urn) burial sites have been surveyed recently (Mahalingam 1970:Fig. 2). The habitation sites at
Tirukkampuliuyur and Alagarai (on opposite banks and facing each other) have been systematically excavated. Tirukkampuliuyur revealed a 31-61 cm thick russet-coated and painted BRW deposit in Period I of the habitation site (ibid. 15). Besides these sites, the same area has sites such as Kattuputtur (Musiri taluk) and Kottaimedu (Kulittalai taluk) which are extensive BRW habitation sites with associated burial grounds (Gururaja Rao 1972:91). Similarly where the river bifurcates, at Tiruchirappalli, or ancient Uraiyr of the Velir and later the inland capital of the Sangam Cōḷas yielded BRW (some having graffiti) from the earliest habitation layer (TAR 1964-65:25). The Sangam texts describe megalithic burial grounds in the outskirts of this city (Aham. 122:21).

In addition to the terrain, these sites were concentrated along the river bank for another specific reason. In western Tiruchirapalli the dominant soil types are the Black and Red soils. The river alluvium, as we stated before, is restricted to the river banks. What is noteworthy is that while the urn burials are usually located on rocky areas unfit for cultivation, the dolmenoid cists are situated on cultivated fields (Gururaja Rao op.cit.). The apparent coincidence of the urn burials with areas suitable for paddy cultivation in Karnataka, eastern Andhra, Kongunadu uplands have been emphasised before.

It appears that in addition to the alluvial soil suitable for paddy cultivation there was another advantage. Western Tiruchirapally has a variety of paddy that grows in marshy areas which do not require ploughing or irrigation. This is an inferior variety of paddy named valan and it is cultivated when the rest of the district is parched and unproductive (Ratnam 1966:47). The large amount of husk and charred paddy found from the earliest levels at Tirukkamppuliuyr (Mahalingam op.cit. 109) clearly attests to the affinity between these groups and
paddy cultivation in this particular area from the earliest period. However, even away from the river the Black and Red soils sustain a variety of dry crops such as chillies, turmeric, rāgī, chōlam which are cultivated in garden plots. Away from the flood plain, cotton and sugar cane are the dominant crops (Ratnam op.cit.). Explorations at Adimalan, an urn burial site (Tirumayam taluk) indicate an associated iron smelting centre there, where the lateritic ores seem to have been utilized (Banerjee 1966:36).

The river alluvium broadens out as it moves east of Tiruchirapalli and in the Tanjore district it becomes a vast tract of extremely fertile land. The coastal alluvium is relatively less fertile on account of the salinity caused by inundating sea water (vide Ghori 1968:42; RIC I972:III.307; Gopalakrishnan 1973:67). Though the Tanjore district receives rainwater from both monsoons, recording an annual rainfall of 1,168 mm. (SHBT 1977:39 Table 2.4), the district depends on the freshes of the rivers rather than on rain for agriculture (Ratnam op.cit. 76). I It may be inferred that unless the main river is controlled at some stage, the delta area with its multitude of small rivers cannot be effectively cultivated. This factor which is so crucial for enhancing the riverine environment has been traditionally associated with Karikāla who is praised during the historic period for this laudable effort to control the river (Silap. x:108-III; Sastri 1975:36). It is possible that 'the major object for which the Grand Anicut was constructed was to surmount the difficulty of the high flood waters of the Kaveri from emptying into the Coleroon and thereby starving the delta' (Krishnaswamy 1966:457). Given this ecological settling, the Kaveri delta i.e. Tanjore district

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I. During the pre-British period a system of 'field-lakes' collected the freshes in the rivers, where every village along the river constructed
is the chief rice bowl, where two crops of paddy can be had with ease.

This ecological factor related to the riverine deltaic plain had a great impact in determining the distribution pattern of the Proto-Historic sites in the Tanjore district or the lower Kaveri delta. Two noticeable features related to the distribution of sites is, firstly, the relatively fewer number of sites in the central delta and a relatively greater number of sites along the coastal belt. Secondly, the near absence of the thick habitation layers belonging to the Proto-Historic period. This unimpressive count on the Tanjore district has been attributed to limited research and the destruction of archaeological evidence due to permanent settlements and prolonged intensive cultivation conducted in this area for near two millennia (Gururaja Rao 1972: 89). However, by taking into consideration the above two factors along with other corroborative evidence, we may suggest the following. It is quite likely the lower delta may have been colonized at a slightly lower date than the surrounding area i.e. western Tiruchirapalli, northern Tiruchirappalli and Pudukottai areas, after the flood plain was controlled to some extent. It is also possible that the relative disparity in the number of sites between the central delta and the coastal delta seems to have been due to different economic functions of each area.

The lower delta most obviously received its megalithic burial tradition from the surrounding areas. A closer look at western and northern Tiruchirappalli including the Pudukottai area shows not only a fair concentration of megalithic sites but also a wide variety of

Cont'd from p., powerful banks which in turn served as catchments for the over-flowing water that was used in the fields (Ratnam op.cit. 22-23).
The first aspect related to this is the extent to which the feature we have noted represents the arrival and persistence of various megalithic groups in areas surrounding the lower delta. While they could not properly move into colonize the lower delta until the flood plain was effectively harnessed, these groups obviously had no immediate reason to move into the delta region unless there was a demographic expansion demanding a greater output in food production. When they eventually decided to move in, it appears that only the urn burial group effectively did so. The Tanjore district is exclusively an urn burial area. Our study has already indicated that even in the Kongunadu uplands and western Tiruchirappali, the urn burials are generally associated with tracts suitable for paddy cultivation. The urn burials in Pudukottai also have yielded rice and other grains (Gururaja Rao 1972:87) indicating a similar association.

The disparity in the number of sites within the central and the coastal areas of the lower Kaveri delta may have been due to specific reasons. If we are to seek an economic factor, this may be seen as the advantage coastal areas provide as points of contact for exchange which can set off a proliferation of sites along the coast or as satellites to a primary centre.

To outline the empirical data, the central delta appears to have only a few burial sites, which in any case are dispersed. The only major sites are located in the vicinity of Kumbakonam. Excavations

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I. The burial typology in western Tiruchirappali has already been stated (supra p.). In north Tiruchirappali the sites overlook the flood plain. For instance the vast burial ground at Perumalpalayam in Perambalur taluk, Tiruchirappalli has stone circles, dolmenoid cists and cairn circles (ibid. 90). The burials in Pudukottai which often cover an area of 3-4 acres, represent pit burials, urns, dolmenoid cists, port-holed cists, cairn circles, stone circles and passage chamber tombs (ibid. 87; Ramachandran 1980:52-55).
revealed a stratigraphical sequence from Megalithic-BRW to late medieval at Solamaligai (IAR 1964-65:24) and a large urn burial site at Pattishvaram near Kumbakonam (IAR 1961-62:27). The Kumbakonam area is central in relation to routes and contacts. Routes criss-crossing from north to south and west to east via the Kaveri valley, must necessarily cut across Kumbakonam, which accounts for the continued occupation of Solamaligai from the Proto Historic to the late medieval period.

In contrast to this, the coastal area has a series of megalithic-BRW sites (IAR 1961-62:26ff.). The major locus is seen around the estuary of the Kaveri at Kaveripattinam while a few more sites are concentrated on the estuary of the Vetlar around Nagapattinam. The sites around Kaveripattinam extend about 8 km. from Neidavasal in the north to Vanagiri in the south (ibid.). Though this area revealed BRW (IAR 1962-63:13; 1963-64:20) these have not been obtained from proper habitation layers/deposits. This area also has not revealed thick habitational deposits, though a trial pit at Sikkal (near Nagapattinam) revealed a 1.82 mt thick layer characterized by fine BRW and red ware (IAR 1964-65:24). It is possible that this BRW may belong to the Early Historic variety. Though regular surveys have brought to light several burial urn sites along the coastal alluvium (IAR 1955-56:27; 1961-62:26-27; 1964-65:23-24), this necessarily need not indicate a very high antiquity for these monuments in this area. The Nangimekalai (chapter 6) refers to the burial ground near Puhār which apparently had cairns (Sirinivasan 1946:14). The only evidence we have for a lower date for this site locus is a C-14 date obtained from Kilaiyur (at Kaveripattinam).1 This date was from a wooden post associated with

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1. This site is about 200 mt. west of the sea at present.
what is believed to be the ancient wharf at this port (IAR I962-63: I3), and it read 316±103 B.C. (IAR I965-66:C-14 dates IO; Ramachandran I975:67). I

On the whole what is clear from the above evidence is, that the lower delta was probably colonized relatively late in comparison with the surrounding areas.

The auxiliary area of the Kaveri nucleus is located to the north (in the districts of South Arcot and Chingleput). This is a low lying fertile coastal belt. The Coleroon and the Ponniyar provide a regular supply of water and especially the rich alluvial deposits brought down by the Coleroon act in lieu of mārūr in the Chingleput area (Ratnam op.cit. 21). A characteristic feature in the auxiliary area is the successful tank irrigation which functions in the land within the three rivers (Palar, Ponniyar and Coleroon). The 'tank country' actually begins further north in Nellore district where the transition from river irrigation to tank irrigation becomes more apparent (Spate et Learmonth I972:737). The relatively high rainfall in this area maintains a consistant supply of water to these tanks. We may also note that, the mineral rich southern Karnataka, North Arcot and Salem districts border this area which is well linked to the former by the major rivers flowing through it. In addition to these sources, there are iron ore deposits within the auxiliary area (Watt I972:505-6; IGC I968:map on mineral resources, facing p. 63). Patches of jurassic sandstone which are dominant in the Madras coastal plain (Spate et Learmonth op.cit. 738) provide this area with limestone. The nature of the coastal belt in this region not only facilitates the working of salt pans but also provide small but convenient backwaters suitable for anchorage.
The Megalithic culture in north east Tamilnadu has been studied relatively well for the past three decades. The distribution pattern and the archaeology of these megalithic-BWR sites is useful to understand the developments during the Early Historic period. Apparently this culture spread to the auxiliary area from the northern uplands along the banks of the Palar and the Ponniyar and from the lower Kaveri plains. Though homogeneous burial sites are known in this area e.g. the urn burial at Amirthamangalam (Banerjee 1966:3–36), there are a number of mixed burial sites. The major burial types are urns, cairn circles, stone circles, dolmenoid cists, and sarcophagi. We have also indicated the admixture of burial types in southern Karnataka, in sections of Kongunadu uplands, in western Tiruchirappalli and in Pudukkottai, which are all located around the auxiliary area.

Even at mixed sites, the dolmens and the cairn with urns, do indicate some form of segregation from each other. A clear case of 'amalgamation' however was found at Sanur where a cairn circle surrounded a dolmenoid cist having a terracotta legged sarcophagus (Banerjee et Soundara Rajan 1959:15–16). Even at mixed sites, the dolmens and the cairn with urns, do indicate some form of segregation from each other. A clear case of 'amalgamation' however was found at Sanur where a cairn circle surrounded a dolmenoid cist having a terracotta legged sarcophagus (Banerjee et Soundara Rajan 1959:15–16).

Though it has been stated that Chingleput district alone has nearly two hundred megalithic-BWR sites (Sririnivasan et Banerjee 1953:105), we have had no access to a documented list of all these sites. It cannot be denied that this area does have a relatively high number of burial sites and some habitation sites with relatively thick BWR deposits. How do we then assess the Megalithic culture in this area within an ecological context? According to field surveys conducted in

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1. According to Codrington, the 'elephant-footed' type found at Katteri and Tengal (or Attantan); (both in Chingleput) is a compromise between the urn and the legged Sarcophagi type burials (1930:Art. No. 139).
In this area, the geology and climate have not only effected the structural form but even the situation of the burial tombs in the Chingleput and neighbouring areas (ibid. 109; Banerjee 1956:23-25; Banerjee et Soundara Rajan 1959:4-5). It is stated that 'the clue to the discovery of megalithic sites is .... the juxtaposition of hillocks, rocks or mere outcrops thereof with remnants of larger irrigation tanks ....' (ibid. 5). In nine cases out of ten these landmarks proved to be accurate in locating megalithic sites in this area (Sirinivasan et Banerjee op.cit.). It has also been pointed out that while the dolmenoid cists tend to cluster on the rocky high ground, the less simpler cairn circles cluster on the slopes or on the farther peneplains (Rea 1888:58; Sirinivasan et Banerjee op.cit. 105).

We may also utilize the data related to the habitation sites to infer certain characteristics of the Proto Historic culture. Major excavations have been undertaken only at three habitation sites so far. At Kunnattur (18 km, south west of Madras) the excavators revealed an extensive burial cum habitation site (IAR 1955-56:23; 1956-57: 31-34; 1957-58:37-38). This is also a mixed stone circles and sarcophagi. The stratigraphy at this site indicates that Period I (the BRW strata) is represented by a 0.2 mt. occupational deposit, and that it coincides with the megalithic burials. Period II (Early Historic BRW) was coeval with brick structures and ring wells (IAR 1957-58:37-38). The discovery of rice in an urn burial (ibid. 37)

I. The Chingleput district can be divided into two geological regions viz. northern Lateritic zone and the southern granitic zone. The nature of the rocks in the two regions affected the structure of the megalithic burials. The softer Laterite of the north was more convenient to raise slab-cist chambers. The irregular form of the granite slab cists in the south is due to its intractable granite (Banerjee et Soundara Rajan op.cit. 5).
and horsebits from a pit circle (ibid 1955-56:23) are significant cultural traits associated with this site.

Kanchipuram and its suburbs were investigated next. The earliest excavation at Pallavamedu yielded an urn burial site and also ring wells (IAR 1953-54). Subsequent excavations at Kamakoti matha revealed a stratigraphical sequence. Period I is characterised by the Early Historic BRW. Roman ware came to light at the upper level of Period I (ibid. 1962-63:12). Still later, excavations at the Kamakshi temple confirmed that the BRW is the earliest habitation strata. While Period IA is characterized by the BRW, period IB is by BRW and Roman ware (ibid. 1969-70:34). More excavations on the eastern side of the temple revealed russet-coated painted ware from Period IA (IAR 1974-75:37-38). According to C-14 dates obtained from Kanchipuram (2085±90) 135 B.C. would be a date for the Early Historic period (Agrawal et Kusumgar 1973:577-78). A second date for the Early Historic period is calculated to (2430±130) 480 B.C. from the same site (IAR 1974-75:75 R.C. dates). ²

The third site is located in South Arcot district at Sengamudu, which is on the banks of the Manimukta river, north of the Coleroon. Though an associated burial site does not occur in the vicinity of this habitation, as in the cases of Kunnattur and Kanchipuram (Banerjee

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1. At Sanur a Sarcophagus yielded horsebits while megalith-5) a cairn circle also yielded horsebits (Banerjee et Soundara Rajan 1959:37). At Mallapadi (Dharmapuri district), the cave site which has a neolithic and megalithic occupational sequence, has rock paintings depicting men on horses (Raman 1978:24).

2. The two other sites in Chingleput district i.e. Vasavasamudram and Arikamedu have yielded habitation deposits, but they belong to the Early Historic period (cf. IAR 1970-71:33; Nagaswamy et Abdul Majeed 1978; Wheeler 1946).
I956:32), an urn burial site has been reported from another part of Sengamedu (TAR 1961-62:26). This extensive habitation site has an 4.27 mt. occupational deposit out of which 2.74 mt. is represented by a BRW stratum, after which the Rouletted Ware make its appearance (Banerjee op.cit.).

Taking into account the above evidence it is possible to suggest that a suitable ecology and a demographic expansion, were crucial to this area playing a significant role during the late Proto Historic period.

If the Kaveri delta i.e. the land east of Tirucharapalli could not be harnessed effectively during the Proto Historic period, the groups moving from the northern uplands and along the Kaveri would have naturally opted for the colonization of the north east area. This was conditioned by three factors viz. a demographic expansion, the introduction of plough agriculture and the introduction of tank irrigation.

The Megalithic level at Paiyampalli not only shows the more regular or the increased cultivation of cereals and pulses, but also the expansion of the habitation site and greater storage facilities. Considering the C-14 dates assigned for the beginning of the Megalithic phase i.e. c. 565 B.C., c. 315 B.C., c. 290 B.C., c. 260 B.C., the upland areas may have witnessed a demographic expansion either due to natural reasons or due to increased community movement by the 4th Cent. B.C. Large burial sites (e.g. Sanur, Amirtamangalam) and thick habitation layers (e.g. Sengamedu) I may indicate an expanding population.

I. In this context the discovery of a Neolithic site at Nallur near Sengamedu is significant (A. Swamy quoted in Champakalakshmi op.cit. II9, note 7). This may point to the existence of groups of people already inhabiting this area who probably integrated with the intrud-
resulting in the rapid accumulation of occupational debris rather than a lengthy period of occupation at these sites. Though the megalithic folk had practiced dry crop cultivation in the lower hills e.g. at Paiyyampalli, the soil in north east Tamilnadu is favourable for the cultivation of high yielding crops such as paddy that could sustain an expending population. But this soil (other than the alluvium) had to be constantly provided with water through irrigation which was possible only after the introduction of tank irrigation to this area. We may attribute the introduction of tank irrigation and paddy cultivation to the urn burial folk. It has been suggested that the non-megalithic burials of Tirunelveli mingled with the dolmenoid culture in the north (Krishnaswami et Soundara Rajan I949:172-3). The importance of agriculture to this area is confirmed by the location of sites near irrigation tanks. In fact, whatever the megalithic type may be, they rarely encroached upon arable land in this region (Banerjee I956:23). The iron sickles from the urn burials near Perumbair hills (Cururaja Rao I972:122) and Sanur (Banerjee et Soundara Rajan op.cit. also confirm the agricultural character of these people.

The general topographical features south of the Kaveri plain (viz. the districts of Pudukottai, Madurai, Ramanathapuram and Tirunelveli) may be outlined in the following manner. The complete western portion is dominated by the southern Ghats which scale over 2500 mt. at certain points. These hills have a relatively high rainfall count and are the sources for those rivers flowing east to the Palk Bay and the Gulf of Mannar. The lowland south of the Kaveri roughly takes the shape of a

Con't from p., .... ing Megalithic folk. The discovery of a neolithic stone celt in association with a pure urn burial at Sengamedu (IAR I961-62:26) may confirm the latter assumption.
scalene having the narrowest point in the extreme south. The rivers flowing east (not all are perennial) provide this area with alluvial tracts. As one moves south not only do the rivers get shorter in length, but the intersecting plains between rivers also become smaller in their dimension. The contour lines indicate different altitude levels running almost parallel to the direction of the coast line i.e. in a southwest-northeast direction. The landscape of the littoral is characterized by a rugged and a relatively low-lying coastline.

The southern sector of Macro-Zone II is significant in that it represents a remarkable coincidence between the Proto Historic sites and the environmental zones.

Let us commence with the hills that border this area in its western division. The Palani hills that command a prominent place in the topography are characterized by the lower hills (up to 1500 mt.) and the western hills (up to 2500 mt.). The southern portion is characterized by sheer precipices overlooking the Kambam and the Vagai valleys (IGI 1974:xix. 371). The Palani hills and the Varushanad hills protrude into the Tamilnad lowlands. These two hill ranges encapsulate the rugged Kambam valley. The latter links up various streams flowing down these hills with the upper Vaigai river, which also originates from the same area. The important Bodhinayakkanur and the Gudalur mountain passes connect the upper Vaigai valley to coastal Kerala (Cochin area) across the Palani and Cardamom hill respectively. Thus the most natural route for the west would be along the Periyar.

Continuing far south these hills become the source of the Vaippar, the Chittar and the Tambraparni. The Vaippar which originates from the Sankaranainarkovil does not maintain a constant supply of water (IGI 1974:xxiii. 215). The Chittar and the Tambapanni are perennial
rivers and they originate from the Potigai hills or the Agastiyamalai which obtains an annual rainfall of nearly 300" from both monsoons (Caldwell 1881:6). Here too the Ariankavu pass of the upper Chittar directly links this area with the Quilon area in coastal Kerala.

The southern Ghats have a wide ranging flora, the most dominant being the heavy evergreen forests. In addition, the fauna has a rich variety including animals such as the leopard, Ibex, jungle sheep, deer etc. (Ponniah 1940:108-9). The Agastiyamalai also contain great quantities of magnetite iron sand which are brought down to the plains by the river Tambraparni (I91 op.cit. 363, 371). Iron ore deposits are located in Sivilliputtur, Shermadevi, Nangunery, Tenkasi, Sankaranayankoil and Brahmasam taluks. There were seventy furnaces at work in this district which produced 230 tons annually around the mid 19th Century (Balakrishnan Nayar 1977:150 note 2). These deposits in the quartz bearing lateritic appear to extend even to the western taluks of Madurai along the lower hills of the southern Ghats (ibid. I908:xvi. 397).

The site clusters that occur at the other upland areas bordering Macro Zone II is a feature shared by the southern Ghats. These hills i.e. the Anamalai, Palani, Cardamom are dotted with different types of burials which belong to the Proto Historic Megalithic-BRW culture as well as those of the subsequent backward communities who adhered to this burial system in these retreat areas. The megalithic monuments of these hills have been relatively well surveyed by Anglade, Rea, Aiyappan and Krishna Iyer (for a collected version see Gururaja Rao 1972:75-85).

The typology of the burials along the southern Ghats are in conformity with those in northern Tamilnad and southern Karnataka, which is a pointer to the direction of movement. There appears to be a heavy
concentration of dolmenoid cists and also menhirs on the upper reaches of
the Amaravati in the Anamalai hills (Krishna Iyer 1967:17). One
group of dolmenoid cists spreads along the lower Palani hills on the
banks of the Kodavanar towards the Kongunadu area. A second group is
located along the Cardamom hills and turns west towards Kerala (ibid.
I8-I9). As a result the dolmenoid cists were often located on the hills
or were cited in the arid areas (e.g. Kongunadu), more suitable for
the cultivation of dry crops and for pastoral activities. It is
interesting to note that even a large number of stone circles and urn
burials are generally located in small valleys e.g. Vilpatti valley,
situated amongst the hills (Gururaja Rao 1972:75).

It is apparent that there is a drift of the stone circles/urn
burials towards the fertile plains from these hills. Urn burial sites
such as Samanattam (IAR 1956-57:80), T.Kallupatti (ibid. 1958-59:32)
are located on the fringes of the upper Velli valley. Another urn
burial site, Thatanodimedu (ibid. 1957-58:38) is located on the lower
area below the important mountain pass Bodhinayakkanur which overlooks
the Kambam valley. The affinity between the urn burials/stone circles
with areas suitable for agriculture even in the hilly regions is worth
noting. In this context the white painted BRW associated with the urn
burials at T.Kallupatti (ibid. 1958-59:31; 1960-61:18) is extremely
significant in terms of the migratory route and the antiquity of the
culture elements.

Similarly, south of these hills the distribution clearly indicates
that the urn burials conform to the pattern associated with them.

I. The white painted BRW have been found within the southern
Harappan context (Lothal), chalcolithic Banas (Rajasthan), Early
Iron Age levels at Hallur, Tirukamppuliyur and from the urns
at Adichchanallur.
Similarly, south of these hills the distribution clearly indicates that the urn burials conform to the pattern associated with them. Along the foot hills of the highlands, a series of Proto-Historic sites are located on the banks of the upper reaches of the Vaippar, Chittar and the Tambapanni. In a north-south order Sivagiri, Pensiyur and Vasudevanallur are extensive urn burial sites on the upper Vaippar at the foot hills of the Sankaranair hills (Krishnamacharalu 1936: 67-68; Cammiade 1930:187-189). On the upper Chittar urn burials are found at Illangi (Caldwell 1877:279-80) and cairn circles enclosing urns at Courttalam (Gururaja Rao 1972:64). An urn from this site was decorated with designs of three serpents (Krishnamacharlu op.cit.). Urn burials are also found in large numbers at Sivasailam on the upper reaches of the Tambapanni at the foot hills of the Agastiyamalai (ibid.).

In addition to the fertile tracts at the foot hill areas, the iron bearing lateritic portions along the southern hills appear to have coincided with the location of these sites. According to the distribution pattern of the Proto Historic sites in the upland areas, there is a spread of sites towards the Vaigai and the Tambapanni plains.

How do we ascertain the reasons for this attraction whereby this became a nuclear area? Taking an overview of this area we may list water resources and soil regions as the crucial factors supplementing the beginnings of settled life in this area.

The topography of the Vaigai valley presents an undulating, flat gently sloping shelf (Spate et Learmonth 1972:775). The Vaigai during the Sangam period was a river that inundated the adjacent regions (Pari 16). Most rivers originating from the Palanis maintain a torrential flow during the rainy seasons, for the rest of the year they are reduced to trickles (IGI 1908:xvi. 387). As the water of the Vaippar
is also too sudden and occasional to be of use for irrigation purposes (IGB 1974:xxiii.362), the rivers in the eastern taluks of Madurai district and Ramanathapuram are seasonal at their middle and lower levels, hence unreliable for agrarian communities. We may also note the significance of the black soil that spreads from southern Madurai district across the middle Vaippar valley to northern Tirunelveli. This soil has a relationship to the distribution pattern of sites. By nature it is less moisture retentive than the Maharashtra deep regur, though it can be more easily worked than the latter. It is extremely suitable for the cultivation of cotton and is rather deficient in organic and nitrogenous compound (Spate et Learmonth 1972:780).

As a remedy these areas have to depend on artificial reservoirs fed by rain water. But this too, is no incentive for the development of extensive agriculture as this area does not obtain more than 864 mm. (34") of rain per year (SHBT 1977:39, Table 2.4; Spate et Learmonth op.cit. 778). Practically all these tanks are dry (so are the rivers) during a greater portion of the year with the exception of November and December when there are heavy rains. In addition to this scanty rainfall, this area also has a high degree of evaporation increasing the parched conditions. The poor lateritic and gneissic soils in this area are more suitable for dry crops rather than wet crops such as paddy (ibid.).

This environmental situation is reflected in the distribution pattern of sites. The most obvious feature is a near absence of Proto Historic sites in Ramanathapuram and in the eastern portion of Madurai.

I. North of the Vaigai delta, on the coast, the port of Tonći is mentioned in the Sangam texts (Kurun 238.4; Aham 60.7, 290.13). This port seems to have developed due to trade during the Early Historic period especially due to its proximity to Chank fisheries and the pearl banks. The Sangam texts mention the Partavar involved in maritime activity (ibid.) while heaps of oyster shells can be found scattered along the beaches from Korkai to Tonći (Maloney 1968:9).
On the other hand in the western taluks of Madurai there is a large megalithic complex spreading to the Palani hills, where urn burials or stone circles are exclusively found almost at every alternate village (Gururaja Rao op. cit. 86-87). Habitation sites in association with burial urns have been reported from Salippapillaiyarnattam and also from Pudur (IAR 1960-61:18-19). The location of a cluster of megalithic burials around Madurai, the early Pāṇḍya capital is also significant. In southern Madurai and north west Tirunelveli (middle Vaippar), sites coincide with the black soil areas, which is convenient even for cultivations based on limited technology.

There are two other aspects related to the Megalithic culture in the Madurai district. The Megalithic-BRW sites in the western taluks of Madurai seem to coincide with sites having microlithic implements. This is extremely clear in the Periyakulam and Tirumangalam taluks. While Tidian revealed a Stone Age factory site, what appears to be a Neolithic celt was found at Karuvelampatti (IAR 1960-61:18). Similarly T.Kallupatti yielded microliths in association with white painted BRW (ibid. 1958-59:31). These Mesolithic sites were perhaps linked to the Teri sites in Tirunelveli (vide Allchin et Zeuner 1956:4-20; Radhunath 1966:81-84; Allchin B. 1966:115-117). This feature is extremely significant in terms of introducing a new technology, subsistence pattern and cultural traits, as well as community integration between two techno-cultural streams during the Proto Historic (i.e., the formative) period.

A second significant factor related to this culture is the discovery of russet-coated painted ware at many megalithic sites in western Madurai, including the earlier mentioned habitation site at Pudur (IAR 1960-61:19; Gururaja Rao op. cit. 87). This is extremely important as
this type occurs at the earliest levels of Uraiyyur, (IAR 1964-65:25),
the lowest level at Tirukampuliyur (Mahalingam 1970:32) and also
from the earliest level at Kanchipuram (IAR 1974-75:37-38). The
identical type also occurs at sites belonging to the Deccan chalcolithic
(Subbarao 1958:176, Fig. 43). Again and again such archaeological
remains not only establish the route of migration and the antiquity
of the sites but also certain linkages which particular Megalithic
groups, i.e. urn burial and stone/cairn circles, had to the earlier
Chalcolithic farming communities and the non-farming Mesolithic people.

The land between the Vaigai and the Chittar-Tambapanni is
separated by ninety miles of harsh land (Ludden 1978:9). Throughout
history, though the Tambapanni valley remained relatively distinct,
these ecological zones are not isolated from each other but interact to
produce their over-arching agrarian system. Hence this area was
influenced politically and culturally by the dominant centres on the
Vaigai and had intensive interactions with Kerala and overseas (ibid.;
Maloney 1968).

The Tambapanni river which originates from the Agastiyamalai hills
follows a course of 70 miles to flow into the Gulf of Mannar (IGI
1974:xxiii. 215). This river is fed by both monsoons (ibid.) and is
seen in full flood twice a year (Caldwell 1881:6). Its major tributary,
the Chittar, also maintains a regular flow. Though the Agastiyamalai
hills get a rainfall of over 300 ins. per year (SHET 1977:39, Table 2.4),
the lower Tambapanni gets less than 30 ins.

which makes eastern Tirunelveli a part of the extreme dry zone in
Tamilnadu recording 230-280 dry days per year (Ramamurthy 1968:24).

I. The russet-coated painted ware has to be distinguished from the
post Megalithic 'Andhra ware' which is coeval with the Roman ware
at Brahmagiri and Chandravelli.
Under such conditions soil and water resources played a crucial role in the evolution of the Chittar-Tambapanni valley into a nuclear area.

Along the Tambapanni and the Chittar, the river alluvium forms a narrow but extremely rich strip on either side (IOI 1974:xxiii. 363). Water percolates easily in this alluvium and it yields a large output in agriculture under irrigation. The capacity of this soil for retaining water, vegetable matter and manure in suspension near the surface in turn results in the high soil fertility of the valley (IOI 1974:xxiii. 368). The water table in these cases remains sufficiently near the surface to be easily tapped (Vasantha Devi 1964:32). The black soil tract of Tirunelveli begins about 10-12 miles of the Vaippar where tank irrigation also ends almost abruptly (Spate et Learmonth 1972: 729). This tract obtains the lowest rainfall count, 25-27 ins. The black soil in this area cannot provide the same level of soil fertility offered by the river alluvium of the Tambapanni, hence the concentration of sites on the river banks and not away from the river.

The southern portion of Tirunelveli district is largely covered by the red soil which can be productive only if it is supplemented with irrigation.

The distribution pattern of the Proto-Historic sites in the Tirunelveli district is not a complex one. The sites spread along the banks of the upper Chittar and the upper Tambapanni, at regular intervals, but in a sparse manner. At Ukkirankottai in the upper Chittar, urn burials were associated with a habitation site (Krishnamacharlu 1936-37:67-68). They begin to intensify in the lower valley where there is a high density of sites (Rea 1902-3:III-II2). The megalithic sites i.e. exclusively urn burials/cairn/stone circles are strictly confined to the narrow river alluvium. Yet, the burials are normally located
on high land, waste or rocky or other such spots unsuitable for cultivation (ibid. II2). This distribution pattern is obviously related to the environmental context elaborated above.

It is the perennial source of water from the Tambapanni and the rich river alluvium that enabled the lower Tambraparni valley to be an area of attraction, though it is located in the driest area of south India. This alluvial soil is extremely conducive for paddy cultivation including millet. The urn burials at Adichchanallur have yielded rice husk and heaps of millet seeds including traces of cotton (Rea 1975:5). The variety of rice found in the urns has been identified as a type still cultivated in Tirunelveli (ibid.).

The key to starting settlements or at least intensifying them because of a demographic expansion may have been possible for these pastoral-cum-agricultural communities if the riverine environment could be harnessed effectively. In the upper reaches of the Tambapanni there are small dams built across the river and the water taken into channels runs alongside of the river and irrigates strips of land lying between them and the river (Krishnaswamy 1966:455). The chronology of these dams are not known though they '..... seem to be very ancient ..... the anicuts do not show any special engineering feature ..... their construction was geared more towards utility and flexibility than permanence' (ibid. 453-4). It has been observed that in the lower valley, the river has been controlled by raising artificial dams from Palamcott to the sea (Caldwell op.cit. 6). It is precisely from Palamcott that the Megalithic sites in the lower valley begin to show

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I. 'The teeth from the remains of an urn at Ilanji near Courtallum ..... indicated molars that had worn down by eating grain. The edges of the front teeth also had worn down by biting some kind of parched pulse. The examination of the mouths of some natives revealed that, their front teeth are worn down a little in the same manner, due to the same cause' (Caldwell I88I:280).
an extremely high density. Rea surveyed this area, and within about 15 miles from Palamcotta to the sea he located 38 burial cum habitation sites along the banks of the Tambapanni (I902-3:III ff.). The close concentration of sites in the lower Tambapanni may indicate an attempt to exploit the alluvium in the vicinity of the settlement to the maximum, in other words - intensive agriculture. The density of these sites as well as II4 acre burial sites such as Adichohanallur speaks for a relatively dense population sustained by a high yielding crop such as paddy.

In the process of colonizing this valley it is likely that the indigenous population may have been assimilated by the iron using people. The teri sites of the Mesolithic people in coastal Tirunelveli seem to indicate a cultural admixture between these groups (Zouner et Allchin I956:4-20). Research on the skeletal remains from the southern burials especially those from Tirunelveli has assigned some of them to Proto-Australoid type or the 'Vedda' type, which is identified with the Mesolithic groups of south India and Sri Lanka (Kennedy I975 for a collated version).

The drift of these groups to the lower plains may have also been conditioned by other factors. In addition to the garnet sand available in the coastal areas (I01 I974:xxiii. 368; WI I956:4. II5), marine resources may also have been an incentive. This was in addition to the major chank fisheries I and pearl banks that were located in the Gulf of Mannar (Hornell I914; EAMS I962:30-33). The low lying littoral areas suitable for the manufacture of salt was an additional

I. The bangles of chank shell found at Karivalamvandanallur (Shankaranainarkovil taluk) urn burial cum habitation site (Cammiade I930:No. I37) were most probably obtained from the coastal area.
attraction to these communities (WI I962:6, 106). The significance of the coastal urn burial sites such as Korkai and Kayal which developed as important exchange centres during the Early Historic period (Caldwell I887:81-83; IAR I963-64:33; I968-69:32-33; Nagaswamy I970:50-54), may be seen in terms of their location in proximity to such natural resources. Korkai, however, is five miles inland at present. This is attributed to the silting of the delta as well as the upliftment of the coast line. Kayal also has met with the same fate (Kalyanasundaram I943:32, 36). The only C-14 dates for the Tambapanni valley come from Korkai, 785 B.C. (Nagaswamy op.cit. 52-53; IAR I969-70:68). I

As for the significance of the Pudukottai area, it may be evaluated from its location between the two nuclear zones i.e. the Kaveri and the Vaigai-Tambapanni. The distribution pattern indicates the concentration of sites in northern Pudukottai while southern Pudukottai is devoid of any burial/habitation sites. This is because, southern Pudukottai forms a part of the extreme arid region of south India along with eastern Madurai, Ramanathapuram and Tirunelveli. Almost all sites are found on the ridges of quartz gravel, usually near a water course, often covering an area of 3-4 acres and usually south of ancient habitation sites (Ayyar I940:520-26). The total complex incidentally overlooks the lower Kaveri plains opposite the Tiruchirappalli area.

The Megalithic culture seems to have entered the Pudukottai area via two routes. The burial types with the typical megalithic appendage i.e. dolmens, menhirs, cists, passage chamber tombs, seem

I. Wood said to be associated with urn burials at Adichchanallur, is dated as (TF-70) 775+95 - II75 A.D. (Agrawal et al. I964:226-7). Considering the antiquity of this culture, the date obviously is an incorrent one.
to have moved in from the Palani-Kodavanar-Bindigul area. The urns, cairn/stone circles seem to have moved in from the Vaiga-Tambapanni area. Port-holed slab cists taking the swastika pattern and passage chamber tombs have their parallel forms along the southern route extending from Karnataka. There also seems to be archaeological evidence indicating cultural traits linking the urn burials in Pudukottai and the Vaiga-Tambapanni area. In one instance, iron weapons with thrust point downwards, have been reported from the urn burials at Adchchanallur (Rea I9I5:4) and a burial at Pudukottai (Sririnivasaan 1938-39;3-5 in Ramachandran I971:88). Similarly, complete skeletons in a squatting position (in urns) were unearthed at Vasudevanallur on the upper Chittar in north Tirunelveli (Cammiade I930:Art. No. I37) and also from urn burials at Pulavayal forest of Pudukottai (Ayyar op.cit. 523). The latter, however, had short swords in their right hands (ibid.).

Archaeological evidence also indicates a probable early chronology for the urn burials that arrived in this area from the south. The discovery of polished stone celts, stone spearheads and scrapers from the urns at Mottaimalai in Pudukottai (ibid.) may show that these groups may have absorbed to their fold the existing stone using community in this area. A significant fact is that burials with megalithic appendage (those that probably moved in from the west), when compared with the urn burials, do not contain skeletal remains, have less iron implements, less BRW and are not rich in grave goods either (vide Gururaja Rao I972:87-88; IAR I975-76:40-4I; Ramachandran I980:52-54). It is believed that the burials with megalithic appendage may have occurred relatively late when such burials were executed for purely ritualistic purposes which did not demand the interment of human
remains of a wide range of burial goods including iron and BRW (ibid.)

If the above assumption is valid, then it is likely that some urn burial groups who gradually descended to the fertile plains of Vaigai-Tambapanni, apparently moved in a northeast direction towards Pudukottai, but cautiously avoided the arid zone in the east unsuitable for cultivations. In Pudukottai 19/21 sites are located in areas suitable for paddy and millet cultivation. Burial urns of Pudukottai have in fact yielded remains of paddy and other grains (Gururaja Rao op.cit., 85). The southern group may have mingled with the urn burial group of the middle Kaveri valley (Karur-Tiruchirappalli area) and reached the northeast auxiliary area (South Arcot-Chingleput) to begin extensive paddy cultivation based on tank irrigation and also chose to live along the coastal belt at places suitable for petty exchange activities, such as Kaveripattinam.

IV - i

Macro zone III or the island of Sri Lanka is an independent geographical entity separated from Tamilnadu by the shallow waters of the Gulf of Mannar, the narrowest point being 20 miles. A physical connection apparently prevailed between these two areas during the Holocene period (Deraniyagala S. 1971). Its close proximity to the southern fringe of the subcontinent, made for the incorporation of Sri Lanka into the cultural vortex of the neighbouring land mass. The very nature of this location also required sea routes extending from the Bay of Bengal, the Arabian sea and southeast Asia to touch the shores of this island. In addition, the relatively small area of land
(25,332 sq. miles), facilitated to a great extent the rapid diffusion of intrusive elements, and the integration of the whole island as a single culture complex within a relatively short span of time.

The credit of introducing the earliest 'civilized habitations' to Sri Lanka has been given to groups of Indo-Aryan speakers arriving from northwest and northeast India (for an overview vide Paranavitana 1959:82-96). Archaeological investigations during the last two decades threw new light on the Proto-Historic period of Sri Lanka and also questioned several dogmas and pre-conceived notions associated with 'beginnings of civilization' in Sri Lanka and its cultural identity (vide Seneviratne 1984).

The geographical proximity, the similarity between ecological zones, common burial and ceramic traditions, including other grave ware and skeletal remains (de Silva 1970:2; Begley 1970:12-13, 97-98; Deraniyagala S. 1972b:122, 155, 159; Kennedy 1975) indicate a cultural homogeneity between the megalithic monuments of south India and Sri Lanka. It also suggests community movement, the intrusions of technocultural elements (iron, ceramic industry, irrigation) and a new subsistence pattern (based on paddy cultivation) from south India more specifically from Tamilnadu, well before the 3rd Cen. B.C. period.

The Proto-Historic culture in Sri Lanka became extremely crucial in providing the socio-economic and the political matrix for the beginnings of civilization. In archaeological terms it marked the beginnings of the transition from the Stone Age to 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 or the tribal structure of the Stone Age, the succeeding Iron Age
established sedentary communities with extended kin groups residing in permanent hamlets or village settlements.

A general classification made of the burial types in 1970 (de Silva 1970:2) indicated urn and cist burials as the two basic types present in Sri Lanka. It seems that the urn burials are restricted to the western and northwest coast, while cist burials dominate in northern Sri Lanka with a dolmenoid cist burial in the northeast. This also indicates that the burials are virtually concentrated in the northern portion of the island while the south is devoid of burial sites. In this context two factors should be kept in mind. The first is that the northern portion of the island is environmentally not a homogeneous unit. It has its micro environmental zones which had some impact on the Proto-Historic sites. The second is that though southern Sri Lanka does not possess any burial sites of the Megalithic culture, it emerged as an important nuclear area during the Early Historic period.

Let us now attempt to locate the Proto-Historic sites within a bio-climatic context.

Topographically northern and southeastern Sri Lanka cover similar terrain. The former, however, holds a more extensive area of very gradually sloping to flat land. The radial hills extending from the central hills across the northern plain also result in a drainage conforming to the topography. These low valleys are not only rich in alluvium but also offer remarkable terrain suitable for the construction of artificial reservoirs on which a hydraulic civilization developed in Sri Lanka. It is precisely these river valleys that form the major line of communication linking the hills with the plains and the coast. The occurrence of the Proto and Early Historic sites along such rivers
connected to the raw material producing hills is therefore, only natural.

A greater number of sites are located within the arid/dry zone watered by the northeast monsoon with an annual rainfall of 25-70 ins. (RMSL 1976:Pt. i; Gaussen et al. 1968). This area also coincides with the major tank irrigated area (Brohier 1935:Pt. iii map.). Since most rivers tend to run dry or reduce their volume of water during the drought period (May-Sep.), artificial restoration of water becomes a necessity both for human use and agriculture. In addition to these (perennial and seasonal) river, the north, especially the northwest is well provided with a large subterranean water table, which is easily accessible below the mass of limestone. The location of the megalithic-RRW sites within the confines of the major subterranean water zone or adjacent to water courses or alternatively near small storage tanks is thus inevitable. Though the antiquity of these tanks cannot be determined for certain, the identical location of certain south Indian megalithic sites near such bodies of water in areas suitable for paddy cultivation is a useful parallel in this context.

The megalithic-RRW sites show a coincidence with soil varieties suitable for agriculture. The red Earth, Calcic Red Earth and the alluvium, are graded as extremely suitable for the cultivation of a wide range of crops. Though the north western sites coincide with Latosol

I. To this day at Kollankanatta (northwest coast) where natural water holes are unfit for human consumption, the fisherfolk obtain fresh water just by digging 3 ft. below the surface (Brohier 1929:393-394). In the Jaffna peninsula where there are no rivers, shallow wells easily reach this water table below the limestone (Spate et Learmouth 1972:791). A survey conducted in 1905 revealed that within 100 sq. miles around Vavuniya in northern Sri Lanka, water was available 10'-15 ft. below surface level and in the majority of cases 2-3 ft. below a rock stratum (Brohier 1935:iii, i9). It has been found that the very creation of reservoirs have resulted in artificially maintaining the water table in northeast and southeast Sri Lanka (Bandara 1973).
which is chemically infertile and not suitable even for shifting cultivation (Panabokke 1979:232), the sites are located on the alluvium created by the rivers flowing through this soil. However, the infertile Latosol has been a primary determining factor in restricting the expansion of habitations within the narrow alluvium in the northwest. The Calcic Red Earth found in the Jaffna peninsula contains excellent physical properties suitable for orchard crops (Gaussen op.cit. 12), supplemented by the sub-terranean water table. The typical dry zone of Sri Lanka contains the Red Earth. This soil type is extremely fertile, has excellent drainage and is good for agriculture especially where the topography provides favourable conditions for irrigated water (ibid. II; Panabokke 1967:84-85). It is precisely this region that developed as the primary nuclear area and it coincides with the intensive-ly irrigated agricultural region of Sri Lanka.

After a long spell of permanent and shifting cultivation there is little evidence of drastic changes in the plant ecology of the Dry Zone. This assumption can be substantiated by the fact that, most floral types mentioned in the Mahāvamsa are present in the dry zone to this day.

The majority of the sites under study fall within the monsoon forest areas which coincide more or less with the Red Earth zone. These forests contain a dominant, dense and continuous undergrowth (Gaussen op.cit. 36) and even under intensive or short cycles of shifting cultivation reforestation is rather rapid (Panabokke 1979:231). Unlike the monsoon scrub jungle in the northwest which is easily cleared even by fire, especially during the drought period, the monsoon forests are effectively cleared only by using metal implements. This environmental zone could be harnessed only when iron using people entered the
northern plains of Sri Lanka and subsequently the southeast.

The introduction of the Megalithic-BRW, represented by the urn burial group, in all probability may have been from the coast of Tirunelveli. The area of location i.e. northwest Sri Lanka, close to the coastal belt, not only speaks for their original home but also the reason for this movement. Apparently, the chank fisheries and the pearl banks may have caused this attraction (Pieris 1917:28; ASAdR 1965-66:86; Deraniyagala S. 1972a:2, Fig. 3, T-1.2). Pookulam at the Modaragam āru estuary clearly shows deposits of pearl oyster with the BRW from stratified layers embedded in coast ridges (Pers. Com. S. Deraniyagala, July 1981). On the basis of ethnographic studies we do not rule out seasonal camps for the early period. It is likely that the sites in Jaffna, and those in the north west may have gradually developed from a 'broad spectrum subsistence pattern' where slash and burn agriculture was supplemented by hunting and marine food (ARCM 1938:18-20; Deraniyagala P. 1955-56:337; ASAnR 1957:26; Begley 1970:41, table 2).

The movement of settlements inland appears to have been triggered off by various factors, viz. demographic expansion demanding a greater surplus in food production and consequently the need to encroach on more cultivable land; a more suitable topography for water storage and irrigation; the demand for an assured supply of a wider range and a greater quantity of raw material with the attending need to exercise a degree of control over raw material producing areas; and natural factors may be listed as the most plausible reasons for this movement.

In archaeological terms, the best evidence for the cultural homogeneity between the coastal sites and the inland sites is a comparison between the burial ware and the artefacts from the stratified
layers of Kantarodai and Anuradhapura. The citadel excavation of Anuradhapura in 1969 was undertaken to establish a chronological sequence for the pottery types of early Sri Lanka (Deraniyagala S. 1972b:48-169) where the strata 3A or the earliest habitational layer of the Iron Age is characterized by the Megalithic-BRW (ibid. I22). Strata 3A and its phase B also contain a good number of post firing non-Brahmi graffiti on pottery which have their parallel forms in the pottery of other megalithic-BRW sites in Sri Lanka and in south India (Seneviratne 1984:297-298). A vertical excavation was undertaken at Kantarodai habitation site (Jaffna peninsula) to correlate the pottery at this site with the sequence obtained from the citadel excavation at Anuradhapura (Begley 1967:23-27). This excavation established the typological similarity between the BRW at Kantarodai and the pre-Christian ceramic assemblage at Anuradhapura (ibid. 27). Similarly it has been confirmed that the BRW pottery from Pomparippu (urn burial site) and Kollankanattta (habitation cum chank factory site) on the northwest coast contain parallel pottery forms adhering to the pre-Christian assemblage at Anuradhapura (Deraniyagala S. 1972:106-119; 1972a:10-13). It has also been evident to the archaeologists that the BRW pottery at Galsophonkanatta (an inland burial site) closely resembles those at Pomparippu (ASAdR 1965-66:104). From this it is evident that the inland movement was initiated from the northwest region of Sri Lanka, thus forming a homogeneous techno-cultural complex covering the whole of northern Sri Lanka.

Investigations at Pomparippu revealed that there were about 8000 burials at that site with an approximate figure of about 10-12000 buried at this site. In addition to this, the excavators also noticed a deliberate crowding of burials at this site (Begley 1970:19, 40, 43).
Similarly strata 3A-B at Anuradhapura which is intrusive indicates a rapid accumulation of the cultural deposit (Deraniyagala S. 1972b: 159). It is quite likely that the restricted river alluvium in the north west surrounded by the infertile Latosol (which is unsuitable even for shifting cultivation) could not provide for an expanding population. Therefore the Red Earth soil region with a terrain suitable for tank irrigation was naturally attractive to these communities. While artificial reservoirs of water existed at Anuradhapura from the earliest habitation level, rice husk was used as a tampering daub in strata 3A (ibid. 159).

This demographic expansion may have been supplemented to some extent by a cultural and a physical fusion between the indigenous Mesolithic people and the iron using Megalithic cultural groups. The excavator at Anuradhapura suggests that '..... the mesolithic phase persisted up to and overlapped with the advent of historic man' (ibid. 63-64; Kennedy 1975:24). Physical anthropological research on the skeletal types of Sri Lanka indicate the existence of some level of biological affinities between the Mesolithic people of Bellan Bandi Pellasa and the Iron Age people at Pomparippu (Lukaes et Kennedy 1970: 74-76). A similar cultural integration between the Mesolithic/ Neolithic and the Iron Age has been indicated in Macro Zones I and II.

As mentioned earlier, the greater requirement of raw material in quantity and variety may have been another consideration for this push towards the inland areas. In the subsequent chapter we hope to establish the following. Strategic resources such as iron, copper, particular

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I. At Anuradhapura the method of pressure flaking applied as the method of manufacturing carnelian beads is similar to that employed by the Mesolithic man to manufacture his tools (Deraniyagala S. 1972b:139).
varieties of mineral stone were available in the coastal areas and in the lower plains. With the exception of copper, more productive sources of iron, mineral stone, mica and even gold can be found mainly in the hills. It is interesting to note that better produced metal implements and the wider use of other minerals occur during the Early Historic period. In the following chapter it will be clear that mineral resources were a prime consideration in the location of megalithic sites in the hinterland areas and in the lower montane region, clearly indicating an inward movement.

In addition to this, land oscillation has been suggested as a reason which prompted the coastal communities to move into the hinterland. It is believed that techtonic instability in this region may have resulted in a threat of submergence and prompted the people to move further inland (Deraniyagala P. 1955-56:127-138). Pali chronicles of Sri Lanka and south Indian literature do record such natural disasters that occurred along the western and northwest coast of Sri Lanka and the south east coast of Tamilnadu (Maloney 1968:289-294). I

Suggestions have been advanced as to the probable chronological context for the Megaliths in Sri Lanka. Paranavitana and Senaratne have attributed a date around 3rd Cent. B.C. for Pomparippu (Paranavitana 1956:14; Senaratne 1969:29). P.E.P. Deraniyagala agrees by and large with the above view though he does not rule out the possibility of a later date around 2nd Cent. A.D. (ASAnR 1957:17). Begley has not attributed an absolute date for Pomparippu, but favours a similar chronological position which has been ascribed to Arikamedu (Begley

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I. Silting leading to changes in the shore line around Mannar seems to have effected the role of Mantal as a port, especially in the medieval period (Carswell et Prickett 1984:59 passim).
I981:94-95). Some consider that the Megalithic burials as a whole, can be placed within a blanket chronology of B.C. 200-200 A.D. (Indrapala I969:51; deSilva I970:2). What really needs to be questioned is whether it is possible to provide a blanket chronology for the Megalithic-BRW sites and also the validity of a date as late as c. 3rd Cent. B.C. as the beginning of these burials in Sri Lanka.

Archaeological evidence confirms that the Megalithic-BRW is associated with the earliest occupational strata ascribed to civilized man in Sri Lanka. At Kantarodai, phase 3 contains Roulletted Ware (Bronson I970:7). If the chronological context of the imported ware in south India, i.e. c. Ist Cent. A.D. (Wheeler I946:34-51) could also be applied in the case of northern Sri Lanka, then phases I and 2 at Kantarodai may fall well within the pre-Christian era. Archaeologically, the BRW at Kantarodai and those within the pre-Christian ceramic assemblage at the Anuradhapura citadel have a common identity (Begley I967:24). Anuradhapura, the site in between Kantarodai and Tissamaharama, revealed that the earliest strata associated with civilized man was composed of Megalithic ERW. This strata has been dated as c. 400-200 B.C. In the extreme south, at Tissamaharama (Early Historic site) I8 ft. below the present surface level, Early Historic BRW formed a 4 ft. thick layer. Asokan Brahmi happens to be engraved on many of these potsherds. About 3 ft. above the upper level of the BRW layer, a Roman coin assignable to the 1st Cent. A.D. was discovered (Parker I884:23-26). This would place the lower level of the BRW layer within a pre-Christian context.

The attribution of c. 400 B.C. as the beginning of the BRW strata

I. Begley however suggests that though the burial was a single culture complex, it represents several generations of population.
at Anuradhapura logically implies a date still earlier for the northwestern Megalithic sites of Sri Lanka. In fact, if it is possible to envisage the inflow of these cultural elements from the Tirunelveli region of Tamilnadu, the northwestern sites of Sri Lanka should then possess a date in between the approximate date attributed to Korkai (c. 800 B.C.) and that of the citadel of Anuradhapura (c. 400 B.C.), i.e. c. 6-500 B.C. at the latest.

The above discussion indicates the nature of the Primary Region. In the first place we have outlined the qualitative character which distinguishes the nuclear area— the lower Krishna-Godavari, the lower Kaveri, the Tambapanni-Vagai zone, northern and southeastern Sri Lanka—from the other areas of the Primary Region. The existence of the broad plains, rich alluvial soil and water resources have been considered as primary factors that go into forming these as nuclear areas. These factors happen to be crucial in the development of an agrarian based economy, in facilitating a wider distribution of settlements and the convenient network of communications.

Secondly, in addition to their close geographical location, a greater cohesiveness to the region in terms of economic, cultural and political activities, was being provided by the situation of these nuclear areas bordering the coastline. The seaboard not only linked the nuclear areas with each other, but necessarily linked the Primary Region with the Extended Regions.

Though some nuclear areas did possess certain raw materials, a larger quantity of the essential raw materials (required for the production of utilitarian and luxury items) often happened to be located in the adjoining highlands which were relatively infertile. Thus each area was essentially comprised of the nucleus which was the primary
agrarian cum habitation base, and the periphery which was the adjacent hilly regions often possessing raw materials. In terms then of the ecological, social, economic, cultural and political developments, though the nucleus and the periphery reflected at times a marked unevenness, the very organic relationship which the periphery maintained with the nucleus as the latter's source of raw material—hence an auxiliary unit—indicates the essential interrelationship that prevailed among micro areas which in the long run were linked to each Macro Zone as composite units.

In the final analysis what emerges then is, a group of fertile zones that are located along the southeast coast of the sub continent. By virtue of the degree of control the nucleus extends over the adjacent raw material producing areas, these zones indicate definite spheres of influence. The ensuing study is an attempt to understand the qualitative and the quantitative nature of the forces that linked the emergent socio-economic groups during the Proto and the Early Historic periods within the nuclear zones of the Primary Region.