CHAPTER III: POLITICAL SPACE

III.11 DEFENCE STRUCTURES
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'Political Space' here means the actual place where political organisations operate the process of decision making and regulate the use of force and leadership. The early Indian text on polity, the *Arthasastra* enumerates that protection of the kingdom and his subjects was one of the main duties of the King. The desire to defend the people from external dangers led to the building of forts in ancient India. Defence was one of the functions of the forts. In this context, political space physically embodies the seats of power, i.e., defence buildings and their accessories. The discussion on the evolution of building technology of the defence structures begins with understanding the meaning of defence mechanism.

Defence is defined as any action that constitutes resistance against attack. It is also regarded as a need requiring the erection of a physical barrier against aggression. This may include the protection of gardens and fields, particularly during the planting and growing seasons, the protection of stored food, the protection of human habitation areas and of animals, the protection of tools, working areas, such as raw materials and route of communication for trade. Early prehistoric people built their dwellings on stilts, piles, on trees or platforms and raised terraces as protection against wild animals and intruders. It can be regarded as fairly well-established that the early Homo Sapiens in the Upper Paleolithic times must have been living in social groups and that these
groups probably defended some kind of territory against intrusion. In the beginning the presence of traps, pitfalls and barricades along the approaches to a settlement may have been thought of as sufficient to impede attackers and give a warning to the defenders.

In general, however, the temporary habitation areas of mobile hunters and gatherers were not demarcated and were no more than imaginary lines drawn between natural features. A settlement could most easily be protected if it is located in, or near, a naturally defended position, as for instance, on a higher ground, amongst rocks, in dense vegetation or on river bends. In prehistoric societies, as Ruth Tringham, points out, the minimum requirements of the demarcation of a habitation territory may have been met by natural boundaries. Where there were no natural barriers available, the minimal means of demarcation appear to have been supplemented by an artificial demarcation of a barrier. It is further likely that there were measures taken against threats and aggression by animal or human agencies, and that they had a defensive or protective function in addition to being a passive demarcation of the habitation. Clear examples of such kinds of defence can be identified as an island surrounded by a fence, a hilltop or promontory settlement surrounded by a ditch, bank or wall, a settlement comprising concentric circles of houses which could further be surrounded by a strong physical barrier or a mound surrounded by a physical barrier. The existence of these in the prehistoric societies may be attested through the excavation of ditches and moats surrounding habitation sites. Their intended function could be either to protect people from animal or human attack, or, only to demarcate the settlement. The width and depth of these would also depend on the soils or rocks into which the ditches were dug and the tools used in their
excavation. In many societies the provision of walls around the dwellings and courtyards served to retain the privacy of their occupants which could also have been used as a means of regulating social relations and preventing the entrance of undesirable visitors into certain sections of a dwelling or settlement. Finally, environment could have provided natural advantages for defence and this must have influenced the choice of the site for a settlement. The reasons that have influenced people to defend a particular place or territory from time immemorial are therefore, likely to be complex to explain and analyse. According the Rowlands, the degree to which settlements may be defended seem to depend on the following four facts: (a) their permanence, (b) the availability of alternative refuges, (c) the intensity of warfare, and (d) the value attached to staying in and defending a settlement by its inhabitants.

Gordon Childe's main criteria to distinguish the early city from a pre-urban settlement was the absorption of a major share of surplus by the non-producing city-dwelling ruling class, which in turn, conferred substantial benefits upon them in the planning and organisation of the city. The institutionalisation of warfare along with the increasing need to protect the urban settlements finally led to the emergence of fortifications in ancient times and this was true of ancient India as well. The planning of the defence buildings mainly depended on the availability of building materials in the area. Variation in the pattern of planning of defence buildings was, however, chiefly due to local limitations of the geographical layout of where the forts emerged. It has been suggested by scholars that the technical skills and materials used for construction of habitations have a tendency to be adapted for the needs of
In some cases, the defence of settlements might require the use of different materials than normally used for building habitations. The Mentifiq tribe of the Euphrates delta, for instance, lived in reed huts that were vulnerable to fire but they constructed small mud forts beside each home for protection against attack.

Physical barriers which could be used for defence if necessary, also served as a clear demarcation between the administrative, political, religious and the market areas of a settlement. Scholars like Trigger have opined that fortresses, city walls and enclosures around public buildings indicate a concern with defence that was already present in tribal societies but, which in the early civilisations, was directed increasingly against potential internal as well as external enemies. These structures were evidently designed to impress foreign enemies as well as potential thieves and rebels with the power of the authorities who were able to build and maintain them.

In focussing on Andhradesa, archaeological investigations have revealed that human habitation in the Palaeolithic period was concentrated on the banks of rivers, rivulets and forest areas and in natural caves and caverns. These natural caves served both as habitation areas and for defence purposes. In pre and proto-historic societies the defence structures must be seen necessarily as part of the habitation buildings and the details of the latter have been discussed above [Chapter II.1].

Recent excavations conducted at Muchchaatla Chintamanugavi in sub-region D has revealed a prolonged occupation of the caves by men inhabiting the Mesolithic period. In the next stage, the Neolithic folk mostly
selected terraces of the hill for settlement in the beginning. After acquiring adequate knowledge in food production the people had to live on a more or less, permanent basis in open areas near their agricultural fields. Sometimes, they lived in pits and it might be interpreted that this was done so that they would protect themselves from wild animals. Excavations at places like Utnoor, Nagarjunakonda, Gandlur and Veerapuram have attested to this kind of pit dwelling activity during the Neolithic phase. These pit dwellings helped to protect them from nature as well as from predators and other human communities. However, these early examples do not help us to clearly distinguish between the natural and built areas. Further, whether they were exclusively made in this way for defence against enemies is difficult to suggest because political activity was still organised by the tribal community as a whole and therefore, to differentiate between the social and political areas cannot be envisaged. It can thus be surmised that caves provided 'natural protection' to early man and later on, when man began to make pits, they served both as dwellings as well as protective areas. In the Lower Krishna Valley a number of Neolithic sites have been located on the terraces of granited hills. The locations indicate that the Neolithic people also selected such naturally protected areas surrounded by ranges of boulders and hills for their habitation.

In early Andhradesa, the idea of creating a fence for a cluster of houses or burials can be found from Period I of our study. The construction of a barricade or a fence with wooden posts for cattle pens in the Neolithic context has been well-attested at Utnoor and Nagarjunakonda. In Period I and II of the Neolithic site at Utnoor,
post-holes implying stockades have been noticed suggesting barricades for small cattle pens without any additional support. A fence of upright wooden posts must have served several purposes, to control the movement of domestic animals, to protect them from wild animals, and also to defend the inhabitants from sporadic raiding or surprise attacks. Fences also served as demarcation lines but may not have been effective barriers against a concentrated human attack. One of the methods used to strengthen wooden fences in prehistoric temperate Europe was to construct a bank of earth backing on to the fence. At Jambuladinna in sub-region D, two small hillocks locally called Chinnadandukonda and Peddadandukonda, about 1 kilometre east of the village were noticed. Here, were found manmade lincets with crudely fabricated retaining walls that dated back to Neolithic times. The occurrence of Neolithic greyware, stone artifacts and stone blades enable us to fix the chronological horizon of this site. These lincets notably served both residential and defence purposes. Similar structures built around habitations and burial complexes have been seen at Chinnamarur and Valigonda and a group of hutments at Chagatur. These examples clearly show that not only the Neolithic folk, but the Megalithic people in Andhradesa too had constructed barricades around their dwellings for safety and protection. These incipient walls were further perfected by the inhabitants to plan a dry masonry wall as at Chagatur in sub-region A. In course of time these early protective walls gave way to the construction of fortifications during the early historic period in Andhradesa.

Defence mechanism began to proliferate in settled societies. The reason for this is that political authority now had to be exerted by a State. In order to protect people from other States, new defence
strategies were evolved. In this context aggression definitely created an environment in which new forms of defence associated with different technical skills and materials had to be adopted, particularly in the face of an enemy using new military tactics and weapons. The earliest evidence of fortifications, it has been pointed out, are a tower and wall that were excavated in the pre-pottery Neolithic village at Jericho. It has been suggested that the fortifications here were constructed to control trade and resources and also for the demarcation of a market area as early as 7000 B.C. These early fortifications were made of mud brick followed by baked brick during the mature phases of the Bronze Age. Barriers of stone, on the other hand, were not preferred because they took much longer to construct and required greater manpower to quarry and manufacture. Apart from exceptional settlements in Iberia and Greece, dated to circa 2300 B.C. by C14 method, where complex encircling bastioned walls of stone were built, factors of time along with skill and manpower seem to have prevented the exploitation of stone in the construction of demarcation barriers in Europe until the Iron Age and the Roman conquest. This was when there was a need for strong indestructible walls to defend against large scale human attacks with a complex war machinery.

In the Indian context the Harappan Civilization of the third millennium B.C. gives the earliest example of defence structures. A recent study suggests that the buildings of the citadels were confined to the large centres of dominance in the core area and to those centres established amongst 'alien' peoples. At fifteen Harappan sites such as Mohenjodaro, Harappa, Gonweriwala, Banawali, Kalibangan, Milanthal, Rakhigarhi, Balakot, Sotka-koh, Sutkagen-dor, Desalpur, Kotara Junikaram,
Dholavara, Surkotada and Lothal there were citadels. A citadel is defined as a fortress or castle near a city intended to keep the inhabitants in subjection, or to provide a final point of defence. At Mohenjodaro and Harappa the citadel was a parallelogram whose buildings were laid on mud or mud brick platforms respectively. Wheeler has unearthed at these places strong and massive fortifications built of hardened earth and mud bricks, with high strong and wide ramparts.

Ratnagar argues that citadel sites represent the emergence of small and independent seats of power at safe distance from the core zone, when the Harappan states or ruling houses branched and fissioned or disintegrated into small units. In such situations some ambitious individuals cast off their ties with the centre and built their own centres in emulation of the central seats of domination. The Harappans surely had defence in mind when they provided such massive walls for fortifications. The enclosures with adjacent towers such as we see at Harappa, Mohenjodaro, Kalibangan, Banwali, Suthagena-dor, and Surkotada had definitely served defence purposes. At Banawali, the peripheral town wall also had rectangular bastions, an elaborate towered gateway in the east and a surrounding moat. Kesarwani who has studied the Harappan gateways admits that the elaborate south gateway at Surkotada shows provision for very closely guarded entry. Here, the entry was gained by a short flight of steps, a right angled turn, then mounting of a ramp, at the top of which another right angled turn gave access to a second flight of steps and a 1.7 meter wide entrance way flanked by a guardroom. At the Sutkogen-dor citadel the southern entrance was flanked by massive stone towers. The citadels of the Harappan sites were militarily defended at high places which saw ceremonial storage and other activities and contained presumably
elite residences. On the India sub-continent these above examples are some of the best illustrations of the early evolution of defence structures. In contrast to the Indus Valley, the Ganges valley from the second millennium B.C. also witnessed the construction of different types of defence buildings. However, these descriptions are based on literary sources.

It is also felt necessary to introduce the literary references to fort constructions in order to understand the common fund of knowledge that the early Indians shared. Early literature provides sufficient information on the defence buildings right from Rigvedic times onwards. According to this early literature the defence buildings would mean all kinds of structures made prominently for military purposes. This includes accessories such as earthen ramparts, enclosure walls, moats, gateways, guard-rooms, etc. The Rig Veda mentions the words pur, durga and dehi to mean rampart, fort, stronghold or defence wall. Villages, towns and cities with hundred enclosures and fortifications have been referred to. It also mentions forts made of asmamayi (Stone) and avasi (Iron). The Atharva Veda points to the existence of the Vapra or rampart. The Rig Veda further mentions Agni and Indra as destroyers of forts and invokes them in several hymns to display their process in order to destroy the forts of the dasas and asuras. It calls Indra as Purandara, i.e., the demolisher of the forts. The Atharva Veda describes forts of Gods as 'impregnable with eight circles and nine portals'. Panini mentions terms for towns, town planning, fort, rampart, moat, gates and watch towers. According to him the most important parts of a city were moats, ramparts and gates which served as the main defences. The plan of the city was usually square or
rectangular, pierced with four gates, one in the middle of the wall on each side facing the four quarters.

In the Deccan the earliest mud fortifications can be dated to between 1500 B.C. - 1200 B.C. In the Jorwe phase at the sites of Diamabad and Inamgoan. These have been reported as the earliest attempts at the construction of defence walls around the habitational area South of the Vindhyas. At Inamgoan, besides houses, there were some other structures which were exposed during the course of excavations. These included a ditch and the fortification wall around the site, a Jetty on the river front, and an embankment and irrigation channel which are all specimens of public works. The excavator opines that the ditch was probably dug in period II (c 1400 - 1000 B.C.) since the stone clusters which probably represent bastions overlay the Malwa level of habitation. The ditch measured 195 metres long and 20 metres wide. It is likely that a mud wall was constructed of stone rubble almost parallel to the ditch running north-south. The heap of stones found here were considered the remains of a bastion of the fortification wall. It is likely that the wall itself was of mud but, at regular intervals, had bastions built of stone rubble set in mud mortar. A massive wall which measured 240 metres in length and with an average width of 3 metres, was constructed for protecting the habitation designated as Inamgoan-I from river floods. The existence of these defence structures suggested by a moat and fortification, have led Dhavalikar to opine that the Chalcolithic settlements represent a strong militaristic nature. At another Jorwe phase site of Diamabad, a defence wall around the habitation area also attests to the above view.

Around the 6th century B.C. after the rise of early State in India,
stone walls around the political centres began to be regularly built. The earliest architectural remains of the historical period in India which throw some light on this type of evidence is the fort wall of Rajagriha dated to the time of Ajatasatru which was built of heavy boulders. The wall is faced with rough massive blocks in dry stone walling and has occasional salient bastions. The outer most wall may date back to the 6th century B.C. According to Ghosh after the downfall of the Harappan civilization in about 1500 B.C., India appears to have lapsed into a village economy since there are no significant architectural remains giving information on forts. Ancient Rajagriha therefore provides the earliest evidence of the kind in the Ganges Valley. These fortification walls at Rajgir have bastions at intervals and extends about forty-five kilometres along the crest of the surrounding hills. The bastions are built of massive pieces of undressed stone, one to two metres in length, carefully fitted and bonded together. No mortar, cement or clamps of any kind have been used in the stone work. These cyclopaen walls, though devoid of any aesthetic merit, are one of the architectural wonders of India.

That there were many such forts is evident from literary references to them. Buddhist literature provides copious references to defence buildings. The Digha Nikāya mentions a border city defended by strong ramparts and towers and provided with a single gate. This leads us to believe that cities of strategic importance were strongly fortified. The Samvutta Nikāya and the Anguttara Nikāya refer to forts. The Jatakas also suggest the existence of forts around the towns and cities. The towns as mentioned in the Jataka tales were surrounded by walls and moats interspersed with gates and watch towers while the villages were sometimes
protected by bamboo palisades. The Mahaummagga Jataka points out that the city of Mithila was surrounded by a rampart with watch towers at the gates. The rampart was provided with three moats, and it was outside of the ramparts that a water moat, a mud moat and a dry moat existed. The Milindapanha also refers to different types of moats like the deep moats and triple moats. The commentary on the text informs us of an utkinnatara udaka or a water moat, kaddamma or a mud moat and sukha or a dry moat. The same text also describes the nagara, called Sagala with a rampart, watch tower, and city gates. It is significant to note that the Milindapanha preserves an account of how a city was to be built.

Apart from the early Buddhist texts, literary references on fortifications some valuable details on types of fort constructions are available from Kautilya's famous treatise on polity, i.e., the Arthasastra. As a political strategist he realised the importance of a fort in its true sense. According to him, at all the four quarters of the boundaries of the empire defensive fortifications against an enemy in war were to be constructed on grounds naturally best fitted for the purpose. These have been described as a water fortification (audaka) which was like an island in the midst of a river, or a plain surrounded by a low ground, a mountainous fortification, parvata which was a rocky tract or a cave, a desert fort dhanvara, which was situated in a wild tract devoid of water and overgrown with thickest growing in barren soil or a forest fortification, vanadurga, which was to be full of wagtail; khajana, water and thickets. Of these Kautilya preferred a river or mountain fort. For Kautilya, the fort occupied a central place in his saptanga scheme as an element of the state and he enjoins upon the King to rear up adequate defence on all four quarters of the boundaries of the Kingdom. Another
noteworthy work on society and polity for the early historic period is the *Manusmriti*. Manu also mentions that hill forts were the best ones. Manu was specific in mentioning that a King should build a town with fortress for safety. On close observation of the above literary references it has been observed by us that the defence buildings in early Andhradesa were built strictly following the textual prescriptions. Most of the early historic fortifications followed these specifications. Some important ones reported from regions contiguous to Andhradesa are found at Sisupalgarh in Orissa and Sannathi and Banavasi in Karnataka. For convenience, the evolution of building technology of the defence buildings in Andhradesa can be studied period wise taking the evidences from all sub-regions in account. Defence buildings were made with mud in the beginning and then strengthened and perfected with a better technology by constructing them with brick and stone.

The earliest fortifications of mud, brick and stone in Andhradesa have been found at Kotilingala, Dhulikatta, Bodhan, Budigepalli, Vadluru in sub-region A, at Nelakondapalli, Veerapuram, Eeswaram and Nagarjunakonda in sub-region B, at Dharanikota, Dantapura, Kotamitta, Puduru in sub-region C and at Satanikota in sub-region D [Map VII and Chart IIIB].

The forts of Period II in their first phase of construction were mainly of mud with earthen ramparts, which were strengthened by brick revetment or construction of brick walls over the existing mud walls. The plans of the forts varied from square to rectangular and elliptical to circular. Rectangular forts have been noticed at Kotilingala,
Dhulikatta, Budigepalli, Veerapuram and Nagarjunakonda. Only at Dharanikota do we find a fort square in plan. The Elliptical plan was preferred at Satanikota whereas it was circular at Kotamitta. Forts built of mud and gravel as building material have been reported from Kotilingala, Dharanikota, Bodhan, Vadluru, Budigepalli, Dantapura and Nelakondapalli. The brick forts of the period were seen at Kotilingala, Eeleswaram, Veerapuram, Kotamitta and Puduru. Stone forts were built in a limited scale as noticed at Satanikota and Nagarjunakonda only [Chart III B].

The fortifications were provided with moats dug into the ground or cut into the rock. Sometimes, the builders planned in such a way that the natural rivers or streams formed moats on one or two sides. Moats dug into the ground all around the rampart walls have been reported from Kotilingala, Kotamitta and Nagarjunakonda whereas the forts at Satanikota and Nagarjunakonda had rock-cut moats.

The associated structures of defence buildings of this period such as gates, guardrooms, bastions have also to be discussed as part of this building technology. The forts at Kotilingala, Dhulikatta, Eeleswaram, Kotamitta and Satanikota had gates and gateways provided to restrict and regulate entry of the people as a security measure [(Chart III B)]. The forts at Kotilingala, Dhulikatta, Eeleswaram, Satanikota and Nagarjunakonda had guardrooms. Buttresses or bastions have been reported from Kotilingala, Satanikota and Nagarjunakonda. The foundations of earthen and brick forts were built with random rubble as seen at Kotilingala and some forts have been built directly on the sheet rock, a feature observed at
### CHART III B

**Period II: Defence Structures**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Site</th>
<th>Sub-region</th>
<th>Plan of Fort</th>
<th>Type of Fort</th>
<th>Building Material</th>
<th>Associated Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bodhan</td>
<td>A</td>
<td>O</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td>Budigapalli</td>
<td>A</td>
<td>X</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Dantapura</td>
<td>C</td>
<td>O</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Dharanikota</td>
<td>C</td>
<td>O</td>
<td></td>
<td></td>
<td>-</td>
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<td>5.</td>
<td>Dhulikatta</td>
<td>A</td>
<td>X</td>
<td></td>
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<td>6.</td>
<td>Kondapur</td>
<td>A</td>
<td>O</td>
<td></td>
<td></td>
<td>-</td>
</tr>
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<td>7.</td>
<td>Kotamitta</td>
<td>C</td>
<td>O</td>
<td></td>
<td></td>
<td>-</td>
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<tr>
<td>8.</td>
<td>Kotilingala</td>
<td>A</td>
<td>X</td>
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<tr>
<td>9.</td>
<td>Nagarjunakonda</td>
<td>B</td>
<td>X</td>
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<td>10.</td>
<td>Nelakondapalli</td>
<td>B</td>
<td>O</td>
<td></td>
<td></td>
<td>-</td>
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<tr>
<td>11.</td>
<td>Puduru</td>
<td>C</td>
<td>O</td>
<td></td>
<td></td>
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<td>12.</td>
<td>Satanikota</td>
<td>D</td>
<td>C</td>
<td></td>
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<td>-</td>
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<tr>
<td>13.</td>
<td>Sasanikota</td>
<td>D</td>
<td>O</td>
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<tr>
<td>14.</td>
<td>Vadiuru</td>
<td>A</td>
<td>O</td>
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<td>15.</td>
<td>Veerapuram</td>
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<td>X</td>
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<td>16.</td>
<td>Yeleswaram</td>
<td>B</td>
<td>O</td>
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**Key:**

- **Land Fort**
- **Hill Fort**
- **Water Fort**
- **tfood Fort**
- **Mud**
- **Brick**
- **Stone**
- **Elliptical C**
- **Circular O**
- **Square T**
- **Rectangular X**
Satanikota and Nagarjunakonda. The forts were built on plains in the early phase of period II and in the second and last phase some forts were built on hills, as at Nagarjunakonda. The forts at Kotilingala, Dhulikatta, Bodhan, Kotamitta, Dharanikota, Dantapura, Puduru, and Nelakondapalli were built on the plains [Chart III B].

To understand the techniques, plan and strategies in fort making at greater depth we have to go into the details of some of the early fortifications in Andhradesa. The recent excavations conducted at Kotilingala in sub-region A have revealed a fortified city datable to the 4th-3rd centuries B.C. which continued its existence up to the 2nd century A.D. with two phases of construction. The first phase is characterised by a mud fort along with the occurrence of the coins of the pre-Satavahana Kings, black and red ware datable from the 4th century B.C. to the 2nd century B.C. The second phase datable from the 2nd century B.C. to 2nd century A.D. has also yielded rich numismatic data and structural activity of the fort in brick. The rich cultural milieu and the fortification with bastions and guardrooms remind us of the towns of the Mahājanapada sites in northern India. During the second phase some parts of the earlier mud fort were found to have been strengthened by bricks. This was a significant development in fort making as noticed at Kotilingala for the first time in Andhradesa [Plate X]. A compact rubble foundation to the fortification was also traced. The fortification wall running east-west with 11 courses of bricks built in offset fashion with mud mortar belonged to phase II, measuring a total length of 19 metres and a height of 1.10 metres. Another important structure was a bastion or watch tower at the south-east corner, rectangular in shape. This is also noticed for the first time in
Andhradesa as a technique in fort making. The size of the brick used was 59 x 29 x 8 cms. This is the earliest fortification so far reported from Andhradesa constructed with mud in its first phase and later strengthened and perfected by brick layers in the succeeding phase on a well laid foundations of rubble stones.

At Dharanikota in sub-region C also several structural phases have been identified in the construction of the fort wall which served as an embankment cum warf connected to the river Krishna by digging a navigational channel. This is the earliest structural evidence of a port attached to a fort walled city so far reported from Andhradesa. Similar evidence of an early historical wharf built of brick was found in the now defunct Rajbandar port on the Elephanta island dated to the 2nd century A.D. At Dharanikota, the first phase was an earthen rampart [Chart III B]. In its phase II the earthen wharf was replaced by a brick one. A new ramp was provided on the embankment. Some structural modifications were made in phase IV. The fort was strengthened by providing a retaining wall of laterite blocks arranged on its top portion in phase V. The excavations at the same site yielded NBP ware, redware and iron objects along with brick structures from the early phase of period 1 A, datable to about the 4th century B.C. This has also been corroborated by the method of C14 dating, which gives a time frame of 405 ± 100 B.C. to 145 ± 100 B.C. 30'-0 high and 60'-0 wide walls running to 500 metres were found on each side which was a remarkable feat of the times and speaks of the utilization of huge amounts of expenditure and control of manpower by a stable political authority. The earth was probably brought from the surrounding areas by cart loads and was dumped at the site marked for raising the earthen ramparts. As the height of the walls was gradually raised head
loads of earth were bought to meet the required amount. The builders took keen interest in making the section of the wall into a trapezoidal shape which could withstand seasonal rains and was also difficult to climb. At Amaravati a coping stone of a railing offers a clear description of the outskirts of a city with a gatehouse surrounded by a fort wall. However, it is the details from Dharanikota which clearly show us the different stages in the perfecting of a walled fortification especially one which was located near a river and also functioned as a port. The absence of a moat may be explained due to its situation on the river bed of Krishna. At Dantapura in the same sub-region, the mud for has walls of 60'-0" wide and 38'-0" high. The earth was well rammed and made compact.

Excavations at Satankota in sub-region D revealed advanced techniques in making moats which were now cut into the natural rock [Plate X]. The walls were now built with brick and stone which is a development from the earlier use of mud for walls and moats. Phase I of Period II at this site is represented by a fortification wall built on a promontory datable to the 1st century B.C. The fort was built in 5 hectares of area elliptical on plan. It was enclosed by a stone wall of 3.20 metres wide built of Cuddapah slabs in mud mortar. The rugged external face of the wall was with well made baked bricks facing of 1.45 metres width. Except for some parts on the north side, the rampart was defended by a deep moat. Chisel marks in the moat are a fine testimony to the hard and sustained work of the stone cutters, to scoop out the channel from a hard living rock. The cutting itself was a great feat of rock-cut technology when explosives for blasting rocks were not available. This is an advancement in the building technology of the defence buildings. In order to cut the
Period II: Brick wall over a mud rampart, Kotilingala, Sub-region A

Period II: Rock-cut moat around a Stone fortification wall faced with brick, Satanikota, Sub-region D
moat in rock, large amounts of skilled labour and material were involved and this can be contrasted to earlier fortifications at Dharanikota, Kotilingala and Dhulikatta which had the moats excavated in the clayey soils. There was a berm i.e., an offset cut into the rock in between the moat and the base of the wall. No other of its kind is so far reported from any other early historic fort. The gateway of the fort was approached by a flight of steps. The post-holes near the gateway indicate the existence of a draw bridge over the moat. Kautilya too had proposed a movable bridge over the moats. Construction of square bastions abutting the walls indicate the provision of a regular buttress for strengthening the fort wall. At Satanikota the provision of gates, deep moat and buttresses further indicate the expansion of technology in planning the fortifications of Period II.

At Eeleswaram the entire early historic site in its Period II, datable to between the 1st-2nd centuries A.D., was enclosed by a rectangular brick fortification wall. The enclosure wall here was found to be similar in construction to that of Sisupalgarh. It had a mud core reinforced on either side with burnt brick. The northern side was pierced with a large gateway, flanked by guardrooms.

During the second half of the 3rd century A.D. construction of forts on hills began, though the building of fortifications on river banks and plains continued side by side. This is evident in the continuance of earthen embankments which have been noticed at Nelakondapalli in sub-region B. The excavations at Nagarjunakonda, also in sub-region B, have revealed some advanced and sophisticated techniques in making hill forts by
locating it near the river bend and on the hills. The low lying portion was raised either, with mud or, stone. The excavations laid bare the remains of a citadel of the city of Vijayapuri with a fort, ditch, gates and barracks. The enclosure wall was 3000 x 2000 ft. In a trapezoidal shape, which ran along the right bank of river Krishna. The builders built a mud fort, a sthaladurga. on the plains and the hilly tract was fortified to serve as giridurga to take refuge in times of siege and offer resistance. The sthaladurga was located on the right bank of the river Krishna and was flanked by the low lying hillocks. On its western side, the river Krishna served as a natural defence and only certain portions were built by brick to complete the shape of the mud fort. It was quadrilateral in shape and roughly confirmed to the karmukha or bow shaped citadel, described by Kautilya. The rampart walls which were built in two phases, were 16'-0 above the ground level. The first phase was represented by an earthen rampart, about 80 feet wide at the base. The brick structure in its second phase was built during the 4th century A.D. The entire hillock was fortified by rings of walls built of solid granite blocks around the hill. Both at its base and on its top, there were four main gates at the four cardinal directions. The thickness of the walls varied from 15 to 20 feet. The builders also excavated a ditch or moat, 12 feet in depth and with a varying width of 74 to 132 feet. Some portion of the ditch had been cut into the natural rock. The main gateway of the citadel was on the eastern side and a narrow postern gate was on the northern side which possibly served as an emergency exit. Subways on either side of the gateway were also provided. There were guardrooms on either side of the gateways. Zig-zag passages provided through the gateways were technically planned to operate the traffic of people with tight vigilance.
in order to properly guard all direct approaches and further they rendered entry into the fort complicated and difficult.

The foundations of the fort walls so far discussed were always constructed of natural rock itself. The surface was prepared either by the rough levelling of irregular ground or by the filling in of cavities with small stones held firmly together by clay which made the bed of the foundations level. The first massive stone layers supported the rest of the wall. These were made of large sized irregular boulders dragged into position upon an artificial ramp with the aid of rollers and crow bars. These boulders presented a unified and vertical surface. Selection of a naturally suitable hilly area, the accessibility of a river bank which served as a natural moat, flat areas on hills which would serve to build barracks, parade grounds, water supply, storage facilities, bastions, enclosures to gates, guardrooms to safeguard the gateways, zig-zag passages to enter the fort all developed from simple to sophisticated constructions by the 3rd-4th centuries A.D. The above-cited example of Nagarjunakonda in particular, can be marked as one such fort where the most complicated techniques were applied. They exhibit not only sound technical skills but the ability of the society to provide resources to build it. Further, the military strategists of the time were careful to follow the textual prescriptions on making well-guarded forts that were an absolute necessity when States vied with each other for supremacy.

During Period III of our study, defence structures have not been found prolifically in the archaeological record because of the then prevailing political and economic situation in early medieval Andhradesa. This period saw the emergence of small States, rise and spread of 'feudal' like
tendencies and degeneration in the economic well-being of the people due to the fragmentation of land holdings and the decline in trade and towns. Some of these aspects have been discussed in depth in chapter I.3 above. A major tendency of the period was the formation of new agrarian settlements. Around these, major temple complexes began to emerge. Though many of these small kingdoms used substantial resources to build monumental buildings like temples, evidence on forts for the early medieval period is limited. In the absence of empirical data based on archaeology we have to rely upon the literature and epigraphs of the period in which some description on the various types of defence buildings is available. The few archaeological evidences of defence structures that are available are at Keesaragutta and Tummalaagudem in sub-region A and at Pedavegi in sub-region C, all datable to 4th-5th centuries A.D. The fort at Gandharikota in sub-region A, and Gutti in sub-region D, datable to 8th-9th centuries A.D., are the other surviving examples. A new type of fort built of wood with simple technology known as Böyakottams and datable to the 9th-10th centuries A.D., are interesting examples of the building technology of the defence structures during this phase [Chart III C].

Early Medieval texts that reflect on architecture like the Brihatsamhita, datable to 6th century A.D. and the Visnudharmottara, datable to the 8th century A.D., provide some information regarding the layout and construction of defence buildings. The Brihatsamhita considers three types of forts, viz., giridurga, sailadurqa and ātavikadurqa. The Visnudharmottara in its second khanda (chapter 26) entitled 'Durga Sampatti Varnanam' describes various layouts of forts, different types of forts, the disposition of various structures in the fort
and so on. The terms **vapra** and **chāva** find frequent mention to mean ramparts of earth or mud in the **Mahabharata**. The **Aranvakānda** contains an interesting account of defence against siege. The **Ramayana** mentions that the city of Ayodhya which means impregnable or unassailable, was surrounded by a deep moat and guarded by a huge gateway and towers. Kiskindha, the abode of Sugriva was a forest fort provided with golden gates, moat and citadel. Lanka, the capital of Ravana, was a typical mixed fort, furnished with four huge gates and four bridges across the moat running around the town. The gates and bridges were provided with **vantras** or missiles like **Sataghni**.

The **Hatsya Purana** refers to six different kinds of forts, viz., **dhanusa**, **mahi**, **nara**, **vriksha**, **iala** and **giridurga**. According to it, the castle was to be surrounded by ramparts and a ditch. Four roads were to be laid out to form squares. The place selected for a fort was preferably to be located on the banks of a river in the shape of a crescent. In addition to the main gates, it is advised to have secret doors to the fort as well. Some of these textual prescriptions had an impact on fort building activity in early medieval Andhradesa.

The forts at Pedavegi, Gutti and Gandharikota in sub-regions C, D, and A respectively, were built on circular plan where as the one at Keesaragutta in sub-region A was rectangular. Regarding the materials used for the buildings, the forts at Keesaragutta and Pedavegi were of brick, and the forts at Tummalagudem and Gutti were built with stone. The unique fort at Gandharikota in sub-region A was of a rock-cut variety. The **Boyakottams** in sub-region C were built of
wood. The forts at Keesaragutta, Gutti, Pedavegi, and Gandharikota all had gateways. Bastions were reported at Keesaragutta and Gandharikota only. A moat was noticed only at Pedavegi. The ones at Keesaragutta, Gutti and Gandharikota belonged to the category of hill forts i.e., girdurgas whereas the one at Pedavegi was a sthaladurga. The Bovakottams, being located in forested areas can be said to belong to the vanadurga type [Chart III C].

The fort at Keesaragutta was built on a hill spread out to 3 to 4 square kilometres, datable to the 4th-5th centuries A.D. It was provided with four gateways on four sides prefaced by a strategic secondary wall in the shape of a crescentic bulge to stop the onslaught of the enemies. This brick fort was raised on a 3 metre wide stone foundation. Plans of the guardrooms near the main gate have also been traced. Some gates were also found towards the local water pond on the hill. There are still traces of pathways inside the fort in between the civilian and the religious structures. The selection of the site here was on a hill and the uneven surface of the area was used for raising walls. Construction of a fort on the hill with all the accessories such as secondary wall, gateways, guardrooms can be said to be an important development on the technology that was used in the earlier forts. The crescentic shaped strategic wall was added to safeguard the main gate. The location of the fort on the hill facilitated the inhabitants to be vigilant and enabled them to keep a vigilant eye on the enemy coming towards the fort. As indicated in texts like the Arthasastra, the builders had accordingly selected a very strategic place for building this hillfort, i.e. girdurga. It was a fort was built with burnt bricks, though the gateways, steps and bastions were built with stone. The foundations of the fort were constructed with
### Chart III C

**Period III: Defence Structures**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Site</th>
<th>Sub-region</th>
<th>Plan of Fort</th>
<th>Type of Fort</th>
<th>Building Material</th>
<th>Associated Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alampur</td>
<td>A</td>
<td>O</td>
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<td></td>
<td>Moat: / Bastion: / Gate: / Guard Room: /</td>
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<td>2.</td>
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<td>3.</td>
<td>Divi</td>
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<td>4.</td>
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<td>5.</td>
<td>Gutti</td>
<td>D</td>
<td>O</td>
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<td>6.</td>
<td>Hanumakonda</td>
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<td>7.</td>
<td>Kandukuru</td>
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<td>O</td>
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<td>8.</td>
<td>Kattem</td>
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<td>9.</td>
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<td>10.</td>
<td>Kolanu</td>
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<td>11.</td>
<td>Mukhalingam</td>
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<td>13.</td>
<td>Pedavegi</td>
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<td>14.</td>
<td>Tummalagudem</td>
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<td>15.</td>
<td>Yanamadala</td>
<td>C</td>
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</tbody>
</table>

**Legend:**
- **land Fort**
- **Hill Fort**
- **Hater Fort**
- **Wood Fort**
- **Mud**
- **Brick**
- **Stone**
- **Rock-cut**
- **Circular**
- **Rectangular**

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The existence of forts at Vengi, Kudura and Pistapura in sub-region C during the 4th-5th centuries A.D., can be noted from Allahabad pillar inscription. Pistapura, modern Pithapuram was also mentioned in Aihole inscription and Maruturu plates of Pulakesi II both referring to his capture of this fort. However, at present only the remains of earthen fort at Vengi and Pithapuram can be seen and thus not much can be discussed on the building technology of these two forts.

Excavations at Pedavegi have revealed a fortification, datable to the 4th-5th centuries A.D. The rim of the fortification had encircled an area of one square kilometre. The walls here are extant to some extent on the southern and western sides. The gravel make up of the fortification wall was to a thickness of 7.1 metres above the first working level. Subsequently, a brick veneer was found at a depth of 0.35 metres along the western edge of the fortification wall. A moat with silt and a water borne layer was also traced. Vengi continued to enjoy a place of political importance in the history of Andhradesa and Eastern Chalukyas are often called the Chalukyas of Vengi. Though the administrative officers of the eastern Chalukyan Kingdom included a Durgapati, an officer-in-charge of forts or defence, there is no archaeological evidence of a full-fledged fort that could have been their capital.

A unique rock-cut fort datable to the 8th-9th centuries A.D. has been noticed at Gandharikota in sub-region A [Plate XI]. The natural bouldary outcrop has been meticulously cut. The stone was removed by the 'blocking technique' and chiselled to give an even and uniform appearance
of a rock-cut fortification. On the southern side of the fortification, a
doorway portal measuring 2.75 x 1.50 metres was also cut in the rock.
Another interesting feature is that the hillock from where the dressed
stones have been quarried for construction of the walls has been done in
such a way that the quarried hill face appears like a square bastion.
After climbing the rock-cut steps on the western side of the bastion, lies
a big gate or royal portal, the approach way of which was cut into the
hillock. Lines were also grooved into the hill for scooping it for

Forts built of wood called Bōvakottams were also known datable to
between the 7th-8th centuries A.D. from sub-region C. The Addanki
inscription of Pandaranga mentions his expedition against the

Bōvakottams when he dismantled them. These were essentially strongholds
of the Boyas who were a war like tribe. The homeland of the Boyas has been
referred to as Bōvaviharadesa. Bōvavidu and Bōvavila in the

inscriptions. The Bovaviharadesa of these inscriptions, according to
Hanumantha Rao, roughly corresponded to the eastern taluks of the present day Nellore district, viz., Kanigiri, Atmakur and Udayagiri. Politically the Boyas had been organised into 12 kottams by the 7th century A.D. The meaning of the word kottam is a fortress and each of the kottams might have developed around a fortified form and were under a Boya Chieftain known as Simhāsana Bova.

Since the Boyas were essentially known as a tribe, their original homeland was probably in the forested regions. The above inscriptive reference to the Bovakottams being dismantled indicates that these defence structures were primarily made of wood because of its ready availability in the forests. A possible way of making them was by piling wooden logs one above other. This is a rare indication of defence buildings constructed with materials of a malleable nature. Interestingly, these co-existed with strong forts of stone and bricks that have been described by us above. Lack of financial stability probably because of their inability to control large agrarian tracts meant that, unlike other Kingdoms, these tribal communities continued to construct Kottams with a primitive technology.

During the Period IV, we find that trade re-emerged which in turn led to the rise of urban centres once again. Now these emerged on a large scale around temple complexes. Both inland and sea-borne trade was carried on. The political authority also expanded to new areas and major Kingdoms emerged with vast tracts of lands under their control. By at least the 12th century A.D., the entire Andhradesa came under a single rule having many minor dynasties as vassals. In this context, a wide network of building new forts began to appear. For this period as well we have to, to some extent, rely upon the medieval literature and inscriptions for Information
on the existence of forts and how they were built in the different sub-regions of Andhradesa. The literary and silpa texts particularly the Manasara mentions seven types of forts, viz., giri, vana, salila, panka, ratha, deva, and misra durgas. They were said to be circular, square or rectangular, surrounded by moats, enclosure walls and ramparts and furnished with various entrances, exits and gateways. It is also suggested that circumambulating flight of steps and secret staircases in the walls were to be constructed. Towers were said to be built on enclosure walls. In the interior were constructed tanks, ponds, canal, etc. The texts further elaborate that inside the forts various kinds of roads were to be laid and buildings for different castes and professions were to be created in a suitable manner. The Samarangana Sūtradāra, written by King Bhoja (1000-1055 A.D.) in its Chapter 10 called Puranivesa deals with town planning of three sizes of cities each having its contingent of moat, city wall, gateway, towers, roads and buildings. The Yuktikalpataru also written by the same King, deals with a description of military buildings as akrtam, natural and krtam, artificial. The Nītivākyāmrtam of Somadeva Suri adopts an altogether different classification. According to him, forts were of two kinds, svabhāvika and āhārva. The svabhāvika forts were those endowed with natural facilities like high hills, water resources, etc., while the aharva or artificial ones were those provided with ramparts, missiles and fire weapons. In these cases entry and exit ways were to be strictly guarded by adept soldiers.

We next detail some information from inscriptions which provide information on forts before discussing the archaeological remains of the period in the different sub-regions of Andhradesa. The Kalidindi plates
of Rajaraja refers to capture of the forts of Bezawada, Dharanikota and Chebrolu, indicative of the existence of these forts. But the extant remains are visible only at Dharanikota. The Chebrolu inscription dated to 1006 A.D. of Satyasraya, son of Taila II of the Western Chalukyan dynasty records his title as Durgatrava Malla while referring to his capture and burning down of the Dannala and the Enamadala forts. Regarding the ancient fort at Rajahmundry which came into prominence during the early medieval period, Sewell has observed "there existed an old fort with walls of great size and height made of earth faced with stones". Thus it is only his observation that informs us of the existence of an earthen fort at Rajahmundry.

Besides references to the existence of mud, brick and stone forts from various sources, we have interesting evidence of the existence of water forts or jaladurgas. Water forts at Kolleru and Divi are well known. The Allahabad pillar inscription calls Kolleru as the Kunala lake while the Aihole inscription of Pulakesin II refers clearly to the existences of a jaladurga. Its continued existence in the subsequent period is known through the Chelluru plates of Chalukya Chola King Kulottunga II dated to 1234 A.D. wherein it is referred to as Sarasipuri of Kolanu whose Chief at that time was Katamanayaka. The Timmapuram plates of Vishnuvardhana I inform us that the fort of Pistapura was captured by him and since then he was known as Vishamasiddhi. As early as the days of Kautilya it had been prescribed that the King should cause a nature made fortress, a water fort surrounded on all sides by water. The Matsva Purana while describing six types of forts had mentioned the importance of a jaladurga. Divi was built into a beautiful jaladurga and later developed by Narayana, the
brother of Jillaboya who was conferred the rulership of Divisima.

Extant earthen ramparts have been noticed at Kanduru, Vardhamanapuram, Puduru and Kaluvakolanu in sub-region A datable to between the 11th-12th centuries A.D. [Map VII and Chart III D]. These massive earthen ramparts were raised to a height of about 20 feet with a basal width of 40 feet spread in 2 to 3 square kilometres. The Hanumankonda inscription dated to 1163-64 A.D. refers to the capture of the Vardhamanapuram fort. At Ramakrishnapuram, in sub-region B there was a square fortress with four bastions at the cardinal points connected by rubble and mud walls datable to the 11th-12th centuries A.D. A mud fort is also noticed at Kolanupaka which was referred to as Kollipaka-7000 and whose walls were said to have been surrounded by tall trees. At present only remnants of mud walls are visible on the outskirts of the same village. Bhuvanagiri in the same sub-region was known as Tribhuvanagiri was a hill fort built with stone. The Kolanupaka inscription of Vikramaditya VI dated to 1106 A.D. mentions it as a fort. The local hillock was selected to erect the fortification. Stone walls were constructed on the hill with gateways provided with steps on either side. Massive stone blocks were used in the construction without any binding material as the extant remains reveal.

Remnants of a rectangular stone fort built connecting the two local hillocks with a circular bastion at three different levels has been noticed at Mallikudurla in sub-region B datable to between the 12th-13th centuries A.D. [Chart III D]. The fort at Musalimadugu also in the same sub-region, datable to the 13th-14th centuries A.D., had gateways and
DISTRIBUTION OF DEFENCE STRUCTURES PERIODWISE
### CHART III D

**Period IV: Defence Structures**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Site</th>
<th>Sub-region</th>
<th>Plan of Fort</th>
<th>Type of Fort</th>
<th>Building Material</th>
<th>Associated Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Adoni</td>
<td>D</td>
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<tr>
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<td>Divi</td>
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<td>Ghanpur</td>
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<td>Konranupaka</td>
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<td>Mallikudurla</td>
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<td>Musalimadugu</td>
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<td>Puduru</td>
<td>A</td>
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</table>

*contd...*

**Key:**
- **Land Fort**
- **Mud**: Elliptical C
- **Hill Fort**
- **Brick**: Circular O
- **Water Fort**
- **Stone**: Square T
- **Wood Fort**
- **Rectangular X**
### Chart III D contd...

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Site</th>
<th>Sub-region</th>
<th>Plan of Fort</th>
<th>Type of Fort</th>
<th>Building Material</th>
<th>Associated Structure</th>
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Key:

- **Land Fort**
  - Mud
  - Elliptical C
- **Hill Fort**
  - Brick
  - Circular 0
- **Later Fort**
  - Stone
  - Square T
- **Wood Fort**
  - Rectangular X
bastions which were constructed with blocks of shale, while the inner core of the wall was filled with mud and stone pieces. It had its main entrance on the east and had a number of rectangular and circular bastions. The fort was surrounded by a moat. The width of the wall measured 8.00 metres and its height was 1.20 metres. A rectangular bastion was cut from stone and measured 6.0 x 30 metres which revealed that it was constructed with bend stones connected to the main wall. The inner edge of the wall was vertical and consisted of well packed earth and stones. The outer face showed a curve. This fort at Musalimadugu was mentioned in the Somadevarājīvam, a text of the 14th century A.D.

The best fort of the period, built with advanced techniques in plan and execution can be seen at Warangal [Plate XI]. It consisted of three rampart walls. The first was built of mud and was about 10'-0 in height. According to a tradition, the mud fort was provided with seventy five bastions, the protection of each being entrusted to a Nayaka in the service of the King. The second fort was the huge mud wall outside Warangal city which had four gates. The wall was surrounded by a deep moat, filled with water. The outer mud fort covered an area of 19 kilometres in circumference. As the Warangal fort was approached from the north, it had a wide and deep moat which encircled the mud rampart. Immediately after the moat, within 4 to 5 metres distance, stood a high and imposing mud rampart. Built of heaped up soil, it rose to about 14 to 17 metres high with a basal width of 4 to 6 metres. On the top, it had a narrow wall walk of 3 metres wide. The Warangal fort was built in concentric circles designed to sustain any attack. According to the description of Amir Khusro, the perimeter of the mud fort was 12,346 yards.
Period III: Rock-cut gateway, Gandharikota, Sub-region A

Period IV: Earthen rampart, Warangal, Sub-region B
The fort consisted of several bastions and was built very strongly. The innermost ring was built of stones, finely fitted in irregular fashion, without any mortar, to a height of no less than 6 metres. Regularly spaced 45 bastions, rectangular in shape measuring 12 x 16 metres, projected outward. In brief, the fort of Warangal consisted of two moats, two ramparts of mud and stone, eight gateways and a number of bastions interspersed at regular intervals.

On plan the outer fort appears to be circular in plan, whereas the inner stone fort was rectangular [Figure 6]. The method of construction of the stone wall was the use of cyclopaen masonry, i.e., piling up stones one above the other in horizontal and vertical order alternately so as to balance the enormous weight. There was thus no use of lime mortar as a binding material. A staircase of 18 steps in the form of a gallery was built along the inside of the stone fort rising to a height of 7.4 metres.

In an overview, it can be concluded that since time immemorial defence mechanisms were established by the erection of a physical barrier against aggression. For pre-historic societies the natural caves served both as habitation areas as well as for defence purposes. During the protohistoric times, i.e., period I of our study, defence structures must be seen as part of the habitation buildings. Sometimes, people lived in underground pits so that they could protect themselves from wild animals and other human communities. We can not see a major difference between natural and built areas during this phase because political activity was still organised by the tribal community. Therefore, structures built around habitations by the whole community served as barricades for safety.
Figure 6

Period IV: Circular plan of Warangal fort, Sub-region B
(a) Outer earthen rampart.
(b) Inner earthen and stone forts.

(Reproduced from G. Michell, 'City as Cosmogram: the
and protection as noticed at Chinnamarur and Chagatur.

In Period II, as the State emerged in a settled peasant society, defence mechanism began to proliferate. From the 4th century B.C. onwards a well-developed town planning with a spurt in building activity prompted by the availability of agricultural surplus led full-fledged defence structures being made strongholds of the elite in society. The defence buildings of Period II were at first mainly mud constructions. In their second phase they were strengthened by brick revetments which were overlaid on the existing mud walls. Almost all forts of this period were provided with moats dug into ground or, cut into the rock. The builders also utilised the natural rivers as moats on some sides as at Kotilingala, Dharanikota, Satanikota and Nagarjunakonda. Varied plans were experimented with while making these early forts and this explains that a store house of technical skills and knowledge was available for them. Gates, guardrooms and bastions and pathways were the other associated structures to these early defence buildings. Advanced techniques were used in making moats which were cut into the natural rock when explosives were not available to blast the stone. The provision of a draw bridge on the water filled moat and the fort walls built with brick and stone are significant developments in fort building and are first seen at Satanikota. Earlier mud walls had been built at Kotilingala and Dharanikota. Most of the forts were built on the plains excepting the one at Nagarjunakonda which was a hillfort. The plans, elevations and details of the most of the early historic defence buildings tally with the contemporary literary and sculptural descriptions of them. The archaeological evidence of defence buildings of the period reveal that they were built with a sophisticated and sound building technology and with a variety of building materials. Selection of a
naturally suited hilly area, use of a the river as a moat, the availability of water all the year round, the construction of bastions enclosures for the gates, guardrooms near the gateways, zig-zag passages are some of the features which are outstanding at Nagarjunakonda. Therefore we can say that the developments in fort building here saw a climax for the early historic period.

The beginning of Period III was marked by a fall of stable empires, urban decay, decline in trade and the emergence of small Kingdoms. This necessarily meant that fragmented pockets of political control emerged all over Andhradesa. Therefore, we have few extant defence structures for this period like those found at Keesaragutta, Gandharikota in sub-region A, Pedavegi in sub-region C and Gutti in sub-region D. Building forts on hills was continued. The concepts of sthala, giri, vana and ialadurgas of the early medieval literary works can be attested at places like Pedavegi, Keesaragutta, Gutti, Bōyakotṭams, Divi and Kolleru respectively. Interestingly, at Gandharikota, a new development in the building technology of defence structures can be noticed. Here the entire hill was cut, i.e., chiselled out of rock and shaped into a fort with gateways and bastions. On the other hand forts built with simple technologies using wood were also known in this period called as the Bōyakotṭams. Thus two contrasting materials of malleable wood and insitu stone co-existed with each other as material that were used for building forts during the early medieval period.

During Period IV, major Kingdoms once again emerged with political authority in Andhradeśa becoming increasingly centralized and this was
coupled with the rise and growth of trade and agriculture. All this gave impetus to construct defence buildings with permanent building materials. During this period, in addition to the use of mud and stone for building forts, water forts became an important means to defend settlements. Divi and Kolleru are well known in this regard. Unlike the early historic examples in which the earthen ramparts were cased with bricks, the defence buildings in Period IV were pitched with stone blocks on their inner sides as noticed at Musalimaduga in sub-region B. Construction of stone forts on hills was also continued and the one at Bhuvanagiri in sub-region A and another at Hanumakonda in sub-region B are the best examples. A significant development in the building technology of the defence buildings of Period IV was the construction of forts with concentric circular walls surrounded by moats in which two outer walls were made of earthen ramparts and the inner most was built of stone as seen at the Kakatiyan Capital city of Warangal in sub-region B. The architects in planning the circular fortification here fulfilled both the cosmological as well as military considerations.

All the accessories of defence buildings as enumerated in the contemporary literary works are found at the Warangal fort. The cyclopaen masonry wall built with heavy stone blocks is a fine testimony to the engineering skills of the period. Provision of bastions, moats, guardrooms and gateways all bespeak of the care taken to make defence buildings as protective as possible. It is also implicit that the defence technology is related to ideology but in a different way, from how it affects religious buildings in medieval Andhradesa.

We have argued above that evolution of building technology pertaining
to defence structures, particularly forts, was fundamentally related to the nature of the State in the four phases of our study. Therefore, only in Period II and Period IV, when State systems tended to be strong and centralized and have enough resources to build monumental structures like forts. It is in both these periods that we also note considerable technological developments that improved the strategic quality of forts and the security that rulers expected from them. Notwithstanding the several changes, the strong tradition of fort building in early Andhradesa, faithfully drew upon the rich knowledge of technique known in several literary texts of ancient India. Forts therefore, occupied a significant place in the political space of the region which, in turn, cannot be detached from the political ideology that motivated the various rulers of early Andhradesa.
FOOTNOTES


8. R. Firth, 'Mori Hill Forts', *Antiquity* vol.I. p.68.


27. ARADN: 1939-40, p.44.


44. Rig Veda I.58.8; I.166.8.
45. Ibid. IV.30-20; II.35-6.
49. V.S.Agrawal, India as Known to Pāṇini. Lucknow, 1953, p.137.
52. Ibid. pp.238-240.
56. JAR, 1953-54, p.9.
58. Dhāra Nikava. II. 46.
59. Anguttara Nikava. IV. 106, 107; Samvutta Nikaya. II. 182.
61. Milinda Panha. I.34.
65. Manusmrti VII,70 and 75-76.
82. As one of the participants in the Excavation Programme at *Nelakondapalli*, a Buddhist site, in Khammam district, I had to stay there for one month during 1987-88. It was during this period that I surveyed the surroundings of the site and noticed the remains of a mud rampart. See E. Sivanagi Reddy, 'A Note on the Earthen Rampart at *Nelakondapalli*, Khammam District', Department of Archaeology and Museums, Hyderabad, 1988, p.2. (Typed Report).


92. Ibid. pp.49-59.


94. J.Burgess, Buddhist Stupas at Amaravati and Jagavayapeta. Madras, 1887, p.xxi, Fig.2.


97. Arthaśāstra. 111.21-35.


100. I.K.Sarma, 'Vijayapuri, the capital of Ikshvakus of Nagarjunakonda', IHQ. vol.XXXIII, 1962, pp.267-82.

101. Ibid. pp.267-82.


104. Mahabharata. II: 5, 25.

105. Rāmāyana: Kishkindha Kanda, 14-5.


109. ARAP. 1990-91 (Cyclostyled), pp.11-17.

110. In our recent survey conducted at Tummalagudem we noticed a circular stone fort provided with gates and guardrooms on the local hillock called Indrapalagutta Tummalagudem is situated 10 kms away from Ramannapet on Bhongir-Chityala Road in Nalgonda district.
111. ARAP. 1975-76, pp.9-10.

112. Ibid. pp.9-10.

113. Ibid. pp.9-10.


117. ARAP. 1990-91, (cyclostyled), pp.11-17.

118. EI, vol.XIX, pp.271-75.

119. NDI, vol.1, Atmakuru, no.32.

120. Ibid. Kandukur, no.10.

121. Ibid. Atmakuru, no.37.


123. Ibid, pp.77-92.


129. EI, vol.XVI, p.17.

130. £11, vol.VI, no.102.


137. ARAP. 1982-83, p.5.


140. ARAP, 1982-83, p.6.


142. Ibid. p.178.
