CHAPTER IV

FORTS

Fortification was considered essential initially during the earliest times for protection against wild animals. Subsequently, as habitations progressed and prospered because of the possibility of hostile attacks, it was necessary to provide protective fortifications to cities and towns and also to raise armies to defend them. The development of weaponry and armament resulting in improvement in the enemy’s striking power evidently had a considerable influence on the design and development of fortification. Thus proliferation in the art and science of fortifications provides an index to the political climate in India during the various periods of its history. The provision of forts along the boundary of a kingdom was advocated by Kautilya in his Arthaśāstra though it could not be successfully implemented. In ancient and medieval Indian literature the term durga generally applies to all kinds of fortifications such as a city on a plain terrain (bhudurga or nagara-durga). The word durga seems to have originated from the Sanskrit word 'durgam', means difficult. The earliest references to the forts and fortified cities are found in the Vedas. The graphic description of Vedic villages and towns is given by Macdonell and Keith in their Vedic Index, as follows:

... Pur is a word of frequent occurrence in the Rgveda and later, meaning 'rampart', 'fort' or 'stronghold'.
Such fortifications must have been occasionally of considerable size, as one is called broad (prthvī) and wide (urvi). Elsewhere a fort made of stone (asmamayi) is mentioned. Sometimes strongholds of iron (ayāsi) are referred to, but these are probably only metaphorical. A fort 'full of kine' (gomti) is mentioned, showing that strongholds were used to hold cattle. 'Autumnal' forts (saradhī) are named, apparently as belonging to the Dāsas; this may refer to the forts in that season being occupied against Aryan attacks or against inundations caused by overflowing rivers. Forts with a hundred walls (satabhujī) are spoken of.\(^3\)

Ramachandra Dikshitar in his book, *War in Ancient India*, aptly observes:

... going back to *Rig Veda* Saṁhitā, we find tribes living in fortifications known by the name pur an earth-work strengthened by a stone wall. There are numerous references to such kinds of fortress building, which were besieged and destroyed by the invading hoards. In the later Brahmaṇa literature also there is a distinct reference to the existence of forts.
In the annual sacrifice portion of the *Aitareya Brāhmaṇa* the three *agnis* or fires are described as forming three forts to prevent *asuras* from disturbing the sacrifice. The *asuras* being afraid of these fires, with *agni* in front and behind, took to flight. Thus the *asuras* and the *Rākṣasas* were exterminated. Here, even the idea of setting fire to the buildings as a last resort receives emphasis. In the *Kausīṭaki Brāhmaṇa* the *Upaśadas* are described as the citadel of *Asuras*, the enemies of the *Devas*. Here these take refuge against the gods. They make citadels of iron in this world, of silver in the atmospheric regions and of gold in the sky beyond. It is clear that the use of forts was well known to the people of the Vedic age.4

Before the Christian era the importance of forts was also appreciated for providing shelter and security to various administrative establishments and protection of wealth. While commenting on the utility of the fort, Manu comments: 'A warrior protected by the fort can fight with a hundred enemy soldiers and a force of one hundred fighting from the fort can encounter ten thousand enemy soldiers.'5 While elaborating the importance of a fort for a king, Manu further adds that 'just as animals like deer need not fear the hunter if they take shelter in a fort similarly a king in
a fort too can remain safe from an invader. Yajñavalkya states that treasure should be stored in a fort protected by an able officer. The Brhaspatismṛti also states that the king should take his residence in a fort. Description of Ayodhya and Lanka forts assumed significant importance during the epic period since the wealth of the kingdom was stored in them and also because they were the centres of administration of the kingdom.

_Durga_ is highly eulogised by the says, as a source of strength to the state for the enemy could not suddenly lay hold to a weak king by force. It is compared to a thousand elephants and a lakh of five horses in strength. The place should have Brāhmaṇs skilled in various rituals and also many artisans in such a place of happiness where there is absolutely nothing to agitate him. In Kautilya’s _Arthasastra_ city was well fortified and was not only the centre of trade and commerce but it also had temples, a sacrificial place, teachers and priests, therefore, a centre of culture too. Kauṭiliya states that, ‘there shall be set up a sthāniya (a fortress of that name may also be termed as nagaradurga) in the centre of eight hundred villages, a _droṇamukha_ in the centre of four hundred villages, a _kharvatika_ in the centre of two hundred villages, and a _sangrahana_ in the midst of a collection of ten villages’.

**CLASSIFICATION OF FORT**

The _Aushanasa Dhanurveda_ is one of the seven known branches of _Dhanurveda_. This _Dhanurveda_ expounds the classification of various
kinds of forts. These forts are *dhanvadurga* (desert fort), *mahidurga* (mud fort), *jaladurga* (water fort), *vanadurga* (forest fort), *baladurga* (fort protected by able warriors) and *giridurga* (mountain fort). This clearly indicates that the science of fortification received considerable importance during ancient times in India. The basic classification of forts given in the *Aushanasā Dhanurveda* was universally accepted in India though few more types were added to this list during succeeding period by various authorities. Manu lists six types of forts: *dhanudurga*, *mahidurga*, *abdurga*, *vārkshyadurga*, *narahurga* and *giridurga*. He states that out of all forts the *giridurga* may be regarded as the best for security. He also mentions drawbacks associated with the other types. The *Viṣṇu smṛti* enumerates only four types of forts. They are *dhanvandurga*, *mahidurga*, *varidurga* (water fort) and *giridurga*. In the *Rāmāyaṇa* forts were divided into four classes such as the river fort (*nādeya*), the hill fort (*pūrṇa*), the forest fort (*vānyā*), and the artificial fort (*kṛtrīmā*). Bhishma enumerates six kinds of forts to king Ydhishtira, namely the *dhanvadurga*, *mahindurga*, *giridurga*, *manusya durga*, *abdurga* and *vanadurga*. These six seem to be traditional since they are generally mentioned by all well-known authorities in ancient India and also in the Purāṇas. Bhishma adds that 'the collection of trusted and able men is the greatest asset of the king and the *narahurga*, a fort protected by such men is the strongest among all six forts expounded in the śastra.'
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Kauṭilya in his *Arthasastra* gives a different classification of forts. The forts are first divided into four main categories depending on the specific nature of the terrain in which they stand and are subsequently classified into eight types. The four main types of forts are water fort, mountain fort, desert fort, and forest fort, which are further subdivided into eight categories. Out of four main divisions, water and mountain fortifications are regarded as the best. He says that 'of two fortified kings, one who has his fort on a plain is more easily reduced than the other having a fort in the centre of a river; for a fort in a plain can be easily assailed, destroyed or captured by the enemy entering it, whereas a fort surrounded by a river requires twice as much effort to capture and supplies the enemy with water and other necessities of life'. A major breakthrough in this field was achieved during the sixth century AD. Varāhamihira in his *BS* wrote a chapter titled *Darkargolam*, which expound the method of finding underground water currents in any given place. Various commentaries are written on this chapter during the last thousand years. Some more research was carried out on the lines prescribed in the text and methods given by Varāhamihira were suitably modified but the basic principles remained unaltered. It is clear from the *BS* that the mountain forts continued to flourish and presently it can be seen that the mountain forts in India are self sufficient in water requirements. In the *BdP* three kinds of forts are described. They are *dhanvadurga* (desert fort)
audaka (water fort) and parvata (mountain fort) The parvata is the best. In the MP six kinds of forts are enumerated. They are dhanudurga, (a castle surrounded by desert), mahidurga (an earth fort), naradurga (a place of safety formed by placing the army in a particular position), varkshyadurga (a place densely surrounded by trees which make it impassable) ambudurga (a fort surrounded by water) and giridurga (a hill fortress) The giridurga is regarded as the best because it is difficult to conquer. Most of the old Indian forts are of giridurga type, built by taking recourse to many ingenious defence devices. The AP also gives the same classification of forts as expounded in the MP. They are dhanvadurga (a fort having a desert or marshy area for its defence), ambudurga (a fort surrounded by some river or like, used for defence purposes), giridurga (a fort having mountaineous defences) mahidurga (fortress built mostly underground), varkshyadurga (a fort built in the midst of a forest) and naradurga (a place safety formed by placing the army in a particular position). If none of the above five facilities of defence be available the king should shift his capital city and the palace in the midst of a brave population who should serve him in good stead in times of need. This classification is the same as that given in the Mbh and in the Manusmriti. Here again the giridurga is regarded as the best because it is difficult to conquer while the other forts can be captured comparatively easily.
The description given in the *Devi Bhāgavat Purāṇa* tallies exactly with those expounded in the Kauṭiliya *Arthaśāstra*. The forts are first divided into four main categories depending on the specific nature of the terrain in which they stand and are subsequently classified into eight types. The *Vāyu Purāṇa* described four kinds of forts. The first three kinds of forts are protected by hills and ditches. The fourth kind of *durga* is called the *Kṛtrima*. The eleventh century's *SS of Bhoja* divides forts into four divisions such as *abdurga* (*jaladurga*), *panka-durga*, *pārvatiya-durga* (mountain fort) and *guha durga*. All of these are described earlier. In *Yuktikalpataru* Bhoja first divides forts into two classes natural (*akritrima*) and artificial (*kritrima*) the natural fort is rendered inaccessible because of its very situation secured by natural defences. Artificial forts are protected by ramparts surmounted by embattled parapets and surmounted by moats. The other natural fortifications mentioned are a river, water, mountain, forest and mixed fortifications.

The *Nārada Śilpaśāstra*, one of the oldest texts on *Vāstuvidyā* speaks of five kinds of fortress. Apart from three very known types *vana-durga*, *giri-durga* and *jaladurga* two more types are *vāhinidurga* and *yudhadurga*. The *Mānasāra* divides forts into eight classes called *sibira*, *vahinimukha*, *sthāniya*, *droṇaka*, *samvidhavāra*. There is further division of these forts according to their position. These are mountain fort, forest fort, chariot fort (*rathadurga*), god’s fort (*deva-durga*), marsh fort (*pankadurga*),
water fort (jaladurga) and mixed fort (miśradurga). The Mayamata gives an identical classification of forts. The Visvakarmā Vāstuśāstra describes 12 kinds of forts. They are known as giri-durga, vana-durga, salila-durga, jaladurga or water fort, irina-durga (dhanva-durga or desert fort), daivata-durga (natural fort), ekmukha-durga (fort with one gate), dvimukhadurga (fort with two gates) chaturmukha-durga (fort with four gates), kurma-durga (tortoise fort), pāravata-durga, yudha-durga and prabha-durga. Here we come across three new divisions of forts. These are kurma-durga, pāravatadurga and prabhu-durga. Śukraniti, the other important work on Nitiśāstra, (having a controversial date) gives us a list of six forts. The parikhadurga, the parighadurga, the vanadurga or forest fort, the dhanvadurga or desert fort, the jaladurga or water fort, the giri durga or hill-fort. Sukracarya believes that the satyadurga and saṁyadurga are the ornaments of all fortresses and repeats Manu's words that a man with arms can fight one hundred when sheltered in a fort and one hundred soldiers can fight ten thousand, hence a king should have forts. Manasollas, also known as Abhilashitartha Chintamani of twelfth century describes nine kinds of forts, based on the types of surrounding terrain and also the specific material used for the fortification of ramparts. The Sivatatva Ratnākara is another important work compiled in South Indian towards the end of the seventeenth century has an interesting chapter on the use and the construction of fortresses. Here nine fortresses are mentioned adding three more to the classical six of the Mbh. These are
identical to those given in the Manasollása. This only shows that as time passed the types of fortresses increased in number.

The other important works which throw light on the subject of forts are Rājaniti Ratnākara of Chandesvara (fourteenth century AD), Rajadhārmakauastubha of Anantadeva, Rajavyavaharakosha of Raghunathpath Hanamante and finally Budhabhushanam of Sambhaji. The last three works were written during the later half of the seventeenth century. All these works stick to the basic six types of forts given in the Mbh, Manusmrti, MP and AP. The Jayapṛcchā also enumerates sixteen kinds of land-forts on the basis of their shape. According to Silpaśāstras there are nineteen varieties of forts.37

**FORTS AND THEIR EXTENT**

In the Vedic literature puras are fortified enclosures erected at the time of some danger without any houses in them.38 The Apastamba Dharmasūtra says that a king should built a palace in the heart of the city and in front of the palace a hall should be built to the south of the city, an assembly hall with its door on the southern and northern side should be built so that one can see from it what passes on inside and outside the city walls.39 Yañavalkya states that treasure should be stored in a fort protected by an able officer.40 The Brhaspatismṛti41 states that the king should take his residence in a fort. It is stated that the fort should be protected with the help of yantras and brave soldiers. The Sāmantas Brāhmaṇs, Kṣatriyas...
and Vaiśyas reside in the fort along with artisans. Market place shall also be provided and the fort shall have two ramparts encircling it. Manu also states that the fort should be provided with all necessary stores and provisions including an arsenal and other secret establishments and adds that the king should build his palace in the centre of the fort.\textsuperscript{42} Kautilya in his \textit{Arthasastra} says that the king may have his fortified capital (sthāniya) as the seat of his treasury (samudayasthānam) in the centre of his kingdom: in a locality naturally best fitted for the purpose, such as the bank of the confluence of rivers, a deep pool of perennial water, or of a lake or tank, a fort, circular, rectangular, or square in form, surrounded with an artificial canal of water and connected with both land and water paths (may be constructed).\textsuperscript{43}

The \textit{MP} states that a king should have his residence in a central place endowed with natural beauty and inhabited by a number of people, tributary kings, princes and loyal subjects. The place should have Brāhmaṇs skilled in various rituals and also many artisans in its vicinity. A king should have his fortress in such a place of happiness where there is absolutely nothing to agitate him.\textsuperscript{44} The \textit{AP} lays down that the king should make his residence in a fort. The fort should be inhabited mostly by the Vaiśyas and the Śūdra class and it should be inaccessible to the enemy. The king should appoint an able and competent person as the superintendent of the fort.\textsuperscript{45}
In the *Arthaśāstra*, Kautilya discusses various schools of thoughts regarding the importance of fortification. He observes, 'The school of Parāśara says that of the distress of the people and distress due to bad fortifications, the latter is a more serious evil, for it is in the fortified towns that the treasury and army are secure, fortified town are a secure place for people; they are a stronger power than the citizens or country people, and they are a powerful defensive instrument in times of danger for the king – as to people, they are common both to the king and his enemy.'

While contradicting this views, Kautilya maintains that, 'the forts, finance and the army depend upon the people, buildings, trade, agriculture, bravery, stability, power and abundance. In all country people do not generally reside on fortified mountains and islands owing to the absence of wide open land. Where a country consists purely of cultivators, troubles due to absence of fortifications; while in a country which consists purely of war-like people, troubles that may appear are due to the absence of territory. Kautilya further quotes the opinion of Pisuna who believes that of the troubles due to absence of forts and want of finance, troubles due to want of finance are more serious, the repair of fortifications and their maintenance depend upon finance, by means of wealth, intrigue to capture an enemy's fort may be carried on; by means of wealth, the citizenry, friends and enemies can be encouraged and establishment of the army and its operations conducted. It is possible to remove the
It is in the fort that the treasury and the army are safely kept, and it is from the fort that secret war, control over one's partisans, the upkeep of the army, the reception of allies and the driving out of the enemies and of the wild tribes are successfully practised. In the absence of forts, the treasury is exposed to the enemy, for it, seems that for those who own forts there is no destruction.

It is apparent that the importance of forts was greatly appreciated during the Mauryan period. The wealth of the kingdom was secured in the forts which were protected by able and loyal officials.

According to MP the treasure should be kept in the southern portion of the palace, to the further south of which should be the place for the elephants. The elephant yard should have its doorway to the east or to the north. The arsenal should be located to the south-east. The kitchen and houses for other works should be provided in the south-east. The houses of the priest and the palaces of ministers, vedic professors and students, physicians, stables and cow-sheds and store houses shall be provided to the left of the king's mansion. The stables should face the north or the south. It is not advisable to have them face any other direction.
The MP, further states that a large number of people should not be allowed to enter the fortress. The fort should be guarded by various kinds of cannons, because weapons that can destroy thousands of people protect the king. The warrior should also remain closely. Besides all these things there should be secret doors as well as other doors within the fort protected by *shataghnis* or by skilled archers and soldiers expert at throwing other weapons. A variety of arms and armament should always be kept ready within the fortress for use during an emergency. Medicines and other provisions should always be stored in sufficient quantity to withstand a prolonged enemy siege.  

The AP specifies five major defects as seriously undermining the strength and value of fortresses in general. These are: the drying and silting up of the ditch with sand and mud; bad and neglected condition of the ramparts and towers; the continued use of old, worn-out and inefficient instruments and machines of warfare; a neglected arsenal and insufficient garrison. It was the duty of a king to see that a fortress was always properly maintained to withstand a siege.

The AP further states that the forepart of the fortification of a city should be in the form of a bow. The sites for various classes of people are to be distributed in the following manner: The goldsmiths and other artisans are to occupy the south-east portions, actors and dancers in the south, the minor artisans and fisherman in the south-west, the arsenal
shall be located in the west, the Brāhmaṇs and monks in the north, merchants guilds in the south-east, the Kṣatriyas, the army and its commanders in the east, the Śūdras in the west and the Mlechchas on the outer fringe. Temples for the gods and other guardian deities are considered appropriate in any area, the harem and the palace of the king are to be built in the east, the royal kitchen and the store-room are to be located in the south-east and the north respectively.

The SS discusses it in greater details. It recommends south-eastern direction for the goldsmiths, which is also recommended by the AP. The Vaiśya to dwell in the south as is also found in the AP. The eastern and northern directions are to be reserved exclusively for the Kṣatriyas and Brāhmaṇs respectively. The text makes further recommendations that the fisherman's houses to be built in the south-west and physicians should inhabit all parts of the town and likewise the army should also be installed. Similar recommendation are also found in the AP. The Śūdras should inhabit the western side of the town.

The security of the fort has been discussed by Kautilya. He opines that the king should cause three moats to be dug round it at a distance of one daṇḍa from each other, ten, twelve or fourteen daṇḍas broad, three quarters and a half of the breadth deep, paved with stones, reaching down to the natural flow of waters with arrangements for draining the excess water. At a distance of four daṇḍas from the moat, he should cause to
build a rampart of six *danda* high, twice that in breadth piled upwards with a flat surface pounded by elephants and bullocks. On the top of the rampart, the king should cause a parapet to be built double the breadth in height, twelve to twenty four *hasta* upwards with a passage for movement of chariots shared like a palm. The parapet can be made with stones.\(^62\) The text further refers to digging of moats at a distance of six feet from each other.\(^63\)

The SS supports the stipulation given in the *Arthaśāstra* that big cities should be surrounded by three moats.\(^64\) The *Aparājitapṛcchā* also recommends three deep and big moats should surrounded the capital\(^65\) and the width of the moat should be of seven cubits (*saptahastapramanataḥ*).\(^66\) Almost all the big and small cities were fortified by moats. The epigraphic sources also refer to moats surrounding the cities for security purposes.\(^67\) The archaeological excavations have also revealed extensive fortifications of towns in early medieval India by digging moats and other ways. The traces of moat surrounding the capital town of Gaṅgaikondacōlapuram have been noticed.\(^68\) Similarly ruined city of Dariyon in eastern India revealed four broad moats surrounding the cities, which contain water even during the driest season.\(^69\) In case of emergency, as these moats were connected with rivers, they could be used to inundate the city. Such arrangement of moats is evident in the
planning of red forts at Agra and Delhi, in Purana Qila at Delhi and at many other places

Kautilya laid great emphases on providing proper civic amenities to citizens and hence construction of roads was considered as vital to the development of the fort. The demarcation of the ground inside the fort shall be made first by laying three royal roads from west to east and, three from south to north. The forts shall have twelve gates and should be provided with suitable places for water, drains etc. Kautilya stipulates that chariot roads, royal roads and roads leading to dromanukha, sthaniya, country parts and pasture grounds shall each be four dandas in width. Roads leading to sayoniya, military stations, burial or cremation grounds and to villages should be eight dandas wide. Roads to gardens, groves and forests shall be four dandas wide and those leading to elephant forest should be two dandas. He emphasizes the construction of separate roads for different purposes. For the chariot path, width should be five aratnis, for cattle path width is four aratnis and for paths for small animals and men width is two aratnis. One should not encroach on the path of small and large animals for the smooth flow of traffic. Also he visualizes the construction of separate roads leading to a dike, forest, cremation ground, or sthaniya or country side pasture land etc. Also, he stipulates that the size of such roads should not be reduced from the prescribed width.
The construction of ramparts, towers and gates represented the other methods of fortification. In the *Mbh* the fort was surrounded by with a *prakāra*. These *prakāras* stood on a rampart, *vapra* or *cāya*, made of the earth collected from the ditches. Some of the *prakāras* were set with jewels. These walls must have been very high. The *Arthaśāstra* refers to *prakāra* built of brick surrounding big cities for the purpose of security. The *MP* states that the rampart and the ditch are the most important elements in the fortification of a castle. Important buildings are to be located in the centre and the fort should have abundance of weapons such as *sataghnis* and others. The doors of the castle should be artistically made.

The salient feature of the town inside a fort is given in the *MP*. The main entrance of the citadel should be stately and big enough to enable the king to pass through it, riding his elephant with the banner streaming. Four roads should be laid out to form squares. There should be a temple in front of one road, the kings mansion in front of the second road. Facing the third road should be the houses of judicial and military officers and the gateway of the city should be in front of the fourth.

The author of *Devi Bhāgavata Purāṇa* states: 'The construction of brick-built walls is indispensable in artificial forts.' It also recommends a height of nine cubits for the city walls and further states that the walls should be raised to nine *hastas* according the rules laid down by
Muni. The *Brahmavaivarta Purāṇa* says that 'the maximum height should be twelve hastas (cubits), and a height loftier than that is not conducive to good'. It fixes the maximum height of the walls of twenty hastas, probably due to the fact that it would affect the flow of wind through the city which might prove hazardous for the health of the inhabitants.

The forts and fortification of towns and cities was also the special feature of early medieval India. The city was defended mainly by walls, moats and gates. The digging of moat ground a city was a very old practice. The *Arthaśāstra* recommends digging of moat and mountain fortification to defend population centres. The SS refers to a rampart wall known as *prakāra* set with towers and turrets, constructed to defend cities. Perhaps the same tradition continued from Kautilya to Bhoja’s period. To make the wall impregnable it was provided with the destructive weapons. The *Appr.* recommends the construction of *prakāra* around the cities for the security purposes along with other towers and gates.

Kautilya says that the forts shall have twelve gates, provided with both land and water-ways and a secret passage. The *MP* states that the doors of the castle should be artistically made. The main entrance of the citadel should be stately and big enough to enable the king to pass through it riding his elephant with the banner streaming. There should be
secret doors as well as other doors within the fort protected by *sataghris* or by skilled arches and soldiers expert at throwing other weapons. In ancient India, villages, towns, and forts were all fortified places. The method of defence or fortification of these cities or towns was broadly divided into two categories: namely, natural fortifications (*akritrima*) and artificial fortifications (*Krithima*). Artificial fortifications like a moat and walls were essential for towns and cities which were situated on a plain terrain devoid of any natural protection. Three methods were employed for artificial fortifications, the construction of ramparts, encircling the ramparts with deep and wide moats and planting trees beyond the moat to hamper an enemy attack. These artificial means of protection were common in ancient India.\(^3\) Kautilya's *Arthasastra* elaborates the duties of the city superintendent or the minister. He had to make a daily inspection of the water reservoirs, of the roads, of the hidden passages going out of the city and fort, fort walls and their defensive works.\(^4\) While conforming this *Sukranitisāra* lays down that he must also attend to palaces, ditches, forts, parapets of the fortifications, statues, weapons, tanks, wells, pipes and other engineering work.\(^5\)

The *MP* elaborates that an important item relates to the providing of stores inside the fort, not only for normal needs but more specially for emergency purposes during war times when the fort was besieged and supplies from outside were cut off. The capacity of the defenders
depended on how long their collection of stores and sources of water supply would carry them. In *MP* chap. 217 gives a very extensive list of stores for easy reference which seems to have been taken from a *Varṇaka* text on this subject. The names of important articles which were collected within the fort is as follows:-

Arms and weapons a list of 28 of which is given; all articles manufactured by the various craftsman (*sarva-śilpa-bhāṇḍa*), musical instruments (*vāḍitra*), herbs and medicinal plants (*āushadhi*), fodder for animals (*yavas*), fuel (*indhana*), dairy products (*gorasa*), all kinds of oil (*sarva-taila*), molasses, sugar, tallow, hides, cereals and rains for food. cloth, barley and wheat, metals, earth and cow-dung, green crops, pulses, combustible materials, and many other kinds of herbs and plants (a list of 70 of them is given). Articles of diet of the sweetening, sour, and astringent sorts, roots, fruits, flowers. Dealers in these commodities also should be kept in the fort. In the *AP* the means of protecting the king from poison is also described.

Kauṭilya says that the shape of a fort may be circular, rectangular or square in form, surrounded with artificial canal (moat) of water and connected with both land and water paths. The *MP* says that the royal fort may be oblong, square, or circular. Circular one is the best or it may be triangular or drum-shaped or semi-circular or if other suitable shapes in the form of military array, diamond shaped etc. The *Mayamata* and
DBP recommend a variety of forts having many shapes: square, rectangular or oblong, circular, elliptical, triangular. The SS restricts its prescription to only one shape: the square one.

The material used for the construction of forts is of great relevance in the present study. The material remains reveal that mainly mud, brick, wood, stone, etc. were used for the construction purposes. Going back to Rig Veda Samitā we find tribes living in fortifications known by the name pur on earth-work strengthened by a stone wall. There are numerous references to such kinds of fortress building. Manu says that the walls of the earth fort are made of mud. In the Jātakas we know that the use of bricks was known to the people of the time. In the MBh and Manusmriti there are three additional types: a fort built of stones; a fort built in bricks; a fort built out of bamboo splits and saw-dust as the material used for the reinforcement of mud walls. The Arthaśāstra says that the sides of ditches are made of stones or bricks but not wood as otherwise fire can easily destroy it. The MP describes baked-bricks, wood and earth for the house construction. In the DBP, the author says that the construction of brick-built walls is indispensable in artificial forts.

The AP says that the temples within the fort would be of clay, wood, burnt bricks or of stone, each one of the latter class excelling in merit the one preceding it. The Mayamata refers to wood bricks and stones used for building purposes. The SS says that the rampart is generally made
of stone, brick or earth. The walls are thick at the base and become progressively thinner as they rise. In *Abhilāśitārtha Cintāmanī* the Chalukyan king of Someśvara of twelfth century also refers to the specific material used for the fortification of ramparts. The *śilpaśāstras* which belong to various periods of Indian history from remote antiquity to the sixteenth century also recommends mud, bricks or stones for building purposes. The excavations conducted in district Puri revealed brick structures that show the bricks, baked or mud-bricks, were mainly used for the constructional purposes.

The forts were not solely equipped with defence artillery but they had temples and gardens too. The fort of Parālaiyūr was surrounded by moats on all sides and had gardens and temples which increased the beauty of the fort town. Danāyakankottai, a fort town of south India, during explorations yielded many traces of old fort building and irrigational channels which indicate that the land was highly cultivated and it was a flourishing city surrounded by moats and ditches. An inscription of twelfth century refers to fortification of Jalor fort by extensive ramparts built by the king Samarasimha.

Inscriptional sources refer to several forts which emerged because of political upheavals in the country. The petty kings ruling in different parts of country raised their own forts and fortifications for the defence purposes. With the passage of time these military units developed into
exchange centres and centres of political importance. The fort of Gwalior under Gurjara Pratihāras was not only a military unit but it also functioned as commercial centre where the merchants represented in the city council. An epigraph of ninth/tenth century refers to the fort of Kollam or Quilon in south India which developed into a centre of international commercial activity.

Fortification was carried out not only for protection but also to highlight the affluence of the cities and towns, and when the fear of external aggression receded in the background the beautification of city-gates and ramparts assumed the prime attention of the nobles.

NOTES AND REFERENCES

6. Ibid.


10. *SP*, IV. II. 76. 20.

11. Ibid., IV. II. 76. 21.


17. Ibid. 7.71.72.


20. The *Mbh.*, Rājadharma I, chap. 86.

21. Ibid., chap. 56.

22. This division of the natural forts may be compared with that made in the *Manusamhitā*, the Purāṇas and the later works on architecture.
The Description in the *DBP* however, is the one most closely related to the *Arthaśāstra*.


24. *BS*, chap. 54.

25. *MP*, chap. 217. 7: *sarveśameva, durgānām, giridurgām, praśasyate*.


27. *DBP*, chap. 72.

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29. Ibid., 8. III.


33. Viśvakarmā Vāstuśāstra, chap. 10.

34. Śukranitisāra, chap. 6.

35. Ibid., II, 237-57.


37. B.B. Dutta, Town-Planning in Ancient India, Calcutta, 1925.


39. AD, II, f. 10, 26.5.


41. Brhaspatismṛti, 28-37.

42. Manusmṛti, 7.75.6.

43. Arthaśāstra, chap. III, p. 50.

44. MP, chap. 217, p. 226.

45. AP, chap. 222, p. 794.

46. Arthaśāstra, chap. I.

47. Ibid.

48. Ibid.

49. Ibid.

51. Ibid., 9-34.

52. AP, chap. 24 1 51, 28.

53. Ibid., chap 106 p. 429.

54. Ibid., p. 429-30.

55. Ibid., p. 431: the *Mayamata*, chap. 10, p. 40, states that the people of all classes should live in the town and they should run their own business.


57. Ibid., chap 10. 90; AP, chap. 106, p. 430.

58. Ibid., chap 10, 91-2, 100.

59. Ibid., 10-11

60. AP, chap. 106, p. 430.

61. SS, chap. 10. 102.


63. Ibid.

64. SS, chap 10. 17.

65. Appr., chap. 72, 51-3.

66. Ibid., chap. 85, 34.


69. ASI, AR, 1924-5, p. 88.


74. Ibid., pp. 226-27.
75. *DBP*, chap. 72.
76. Ibid.
77. *BVP*, chap. 103.
80. *SS*, chap. 10, 46; *Appr.*, chap. 72, 51-3.
81. *Appr.*, chap. 70, 21-3.
82. *Arthaśāstra*, II, chap. IV, p. 53
85. *Śukranitisāra*, chap. II.
91. *DBP*, chap. 72.
92. *SS*, chap. 10.
98. *DBP*, chap. 72.
100. *Mayamata*, chap. 15, pp. 75-80.