CHAPTER IV: DEFINITION, CONCEPT, EVOLUTION
AND CLASSIFICATION OF FORTS

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SECTION I:
Definition:
The term fort, in ordinary usage, implies, stronghold, offering protection and security to the inhabitants that seek refuge in it. In Sanskrit language, it is commonly known as Durga: meaning hard to approach, or difficult to access, or inaccessible. In Vedic literature, it is referred to as Pura, meaning a fortified city, thus equating a city and fort. Its corresponding Telugu term is Kōta analogous to Tamil Koṭṭai and Kannada "Kōte".

Concept:
Primarily the term fort denotes defence—defence from the hazards of nature, like rain and Sun, and attacks from outside. According to Columbia Encyclopaedia, "forts are built in times of peace, designed to protect political, industrial, transportation, and communication centres". That is their importance is chiefly strategic, erected for the purpose of strengthening a place or position. According to it, forts are of two kinds, viz., Permanent fortifications and Field Fortifications. The former i.e. permanent fortification is known as a Fortress, protecting or enclosing a centre of population, while a field fortification i.e. Fort, "occupied only by soldiery, defends a position primarily strategic". Thus the nature of fortification is dual in purpose—to afford protection
from the enemy's offensive and to make defence effective. According to Sri G.T. Date "in times of yore, the fortress, was a capital means of defence". Hector straith in his Treatise on Fortification and Artillery observes, Forts are equally useful in offensive as defensive war afare. According to him "while they in themselves will not arrest an army, they are excellent means of retarding, embarassing, and annoying a victorious army". Hence, he warns that great care should be taken, while raising Fortifications. He says that the strength of a country does not consist so much in the number of Fortresses, as in their good disposition, and the difficulties which they offer to an attack. An ideal fort should be provided with exterior forts, that keep the enemy at a distance, and a brave garrison, to defend its approaches, in which case, no fear need be entertained of the rockets and bombs of the basieger. Hence the need for an exterior line of works, which is a main means of resistance. 

From the above, it is clear that defence, is the predominant characteristic feature of the Fort. Before proceeding to deal with the antiquity and evolution of Forts in India from the earliest times, we shall examine the various factors that prompted the birth and rise of fortification system. In this, it may be noted, that the growth of fort as a defensive structure, depended to a large extent, upon the contemporary trends of war fare, i.e. the methods of attack and defence, the weapons used, and the military organization of the various kingdoms, in different periods.
SECTION II

Factors:

Sri B.P. Sinha remarks that "Fort grew as a corollary to the existing trends of warfare which is one of the oldest aspects of human existence". He also says that "the art of warfare, evolved, from the earliest times with attention paid to both offensive, and defensive weapons" and it continued to be the most dominant and persistent features of Indian history. According to Sri P.C. Chakravarti "warfare arose out of two basic instincts in Man—the instinct of Self Preservation, and the Instinct of Self expansion", which accounted for the innumerable wars in the whole course of Indian history. A close examination of several battles, and their causes reveals that, the instinct of Self expansion or aggrandizement, formed the main basis for warfare, out of which arose the system of defence, in the form of forts and fortifications. Wars are fought in this country, for more than one reason. While in the earliest times, i.e. prehistoric periods, Cattle raiding and robbery of surplus food produce, formed the main causes for inter group or tribal clashes, it was the turn of political ideas, like Kingship and State in Vedic and post Vedic times, to contribute, in a large measure, for the increase in warfare. Added to this was the emergence of economic and social organization of the State which also had their role in increasing the warfare. During this period, flourished a number of smaller states, or petty principalities,
like the Greek city States, termed as Rashtra, under the leadership of a king or Rājan. Below the Rashtra, was the grāma or village which formed the basic unit of political and economic organization of the State, headed by a village headman called grāmanī. It was the duty of the village headman, and king, not only to govern their subjects, but also to protect them, from the attacks of neighbouring principalities or tribes. This existence of several petty principalities, brought in to operation, the instinct of Self Expansion i.e. to expand their power and authority, which gave rise to a series of internecine wars among the several Janapadas or Tribal states. In the subsequent periods, i.e. epic and early historic times, there came about a new political idea, i.e. the concept of digvijaya or waging victorious campaigns aimed at attaining universal fame or glory for the invader, which accounted in a large measure for the increase of warfare among several kingdoms. Besides, there are several other causes like boundary disputes, succession struggles, lust for personal gains of wealth and power, religious fanaticism, which contributed to some extent, for the increase in warfare both in ancient and medieval periods. Further, wars were also fought to bring about order and suppress rebellions, and to occupy areas of strategic importance, as the Indo-Gangetic basin in North India and the Krishna-Tuṅgabhadra doab in the South, which formed the bone of contention among rival powers.
According to Sri S.D. Singh "Kingship grew out of warfare" which may be said, in turn, gave birth to the system of defence in the form of forts and fortifications. Hence the nature and character of a fort depend to a large extent upon the contemporary trends of warfare, while the principles of war remained more or less the same. That is to say, while the underlying concept of fort is defence, which remained constant throughout, the fort as a structure went on undergoing changes from time to time, varying in its shape, size, plan and the materials of construction, in order to keep tune with the changing techniques of warfare, and the exigencies of military and political requirements.

From the foregoing study, we understand, that the system of fortification came into existence, primarily due to warfare, which again is due to a number of factors beginning with factional feuds and culminating in national struggles. It is also clear, that, warfare and fort were interdependent, each changing with the other, i.e. with the improved methods of attack and defence.

SECTION III:

Antiquity and Evolution of the Fort

While tracing the antiquity of fortification in India, it is necessary for us to study the basic settlement and habitation patterns obtaining in pre and proto historic times. It is common knowledge that the Neolithic Revolution in India as in the
other parts of the world, brought in its train a relatively primitive agricultural and pastoral economy, with settled habitation, and domestication of animals, which also gave birth to the system of dwelling structures. According to Allichin, "habitation in Neolithic chalcolithic times, included small open air sites, caves, and rock shelters of hills." According to him "the main considerations were, occupation-agriculture and hunting, defence and communications." That is, during this period, functioned the instinct of self preservation, which led the people of pre-historic times, to erect, thorn hedges, wooden stockades, cattle pens, and earthen walls, which in Sri G.N. Pant's view, formed the primitive types of fortification. This is amply proved by the existence of great walls around Kota Diji and Kalibangan, which were primarily meant to discourage animal and human intrusion. This further draws support from the several Neolithic settlements in South India, which according Allichin "were made on the tops of hills, caves, or rock shelters, which were often enlarged, by the construction of terraces in front." Habitations of the same period are also discovered at Sangamakallu, Tekkalakota, and Hallur. At Hallur were discovered by Sri Nagaraja Rao "evidences of circular huts with conical roofs.

From the above discussion, we learn that defence was one of the considerations of prehistoric dwellings be it a cave, rock shelter, or hut, which led to the construction of later day house types, which in turn led to the formation of villages, towns and cities. Thus the beginnings of a fort, or fort as a structure, may
be traced back to the prehistoric dwellings, although primitive inform, for, according to Sri Binod Behari Dutt "even an antique house represents a fort in structure". According to him "the predominance of defensive character, in any sort of human habitation, in ancient India, be it a rock, village, or town, is a rule in Aryan social evolution".

The next important phase in the Art of Fortification, as understood in the common sense of the term, appears at Kohtras Buthi, Kot Diji and Mazena Damb in Sind which yielded traces of defensive walls, ramparts, towers etc., built of stone and belonging to Amri and kulli wares, slightly earlier than Harappan.

Kot Diji: Lies 15 miles south of Khairpur and 25 miles east of Mohenzodaro. Here, a fortified town of pre-Indus date has been discovered by Khan with a strongly walled citadel, armed with rectangular towers of stone and mud brick.

Kohtrás Buthi: excavated by Sri N.G. Majumdar, revealed a fortified site of Amri culture. The fortifications consist of a low rampart wall, and a second wall, larger and stronger than the first; built of cyclopean masonry and bastions with an entrance on the southeast. Prof. Pigott calls it as a "promontory fort".

After this came the discovery of two lofty citadels at Harappa and Mohenzodaro by R.E.M. Wheeler "of uniform size and nature". There, in its early phases, the fortification consisted merely, of a defensive rampart or bund, about
10 to 20' high, above the flood level, built of mud and debris. Above it was the main wall, built of mud and brick reinforced by rectangular towers or Salients, representing an elaborate system of enfilide. At Harappa, the citadel resembled a parallelogram measuring 460 yards x 215 yards, with a complex western gate system and guard rooms at the outer angles. Mohenzo-daro also had similar fortifications. Here, according to the excavator, "did not exist any political organization." During the last phase of the city, according to the excavator "were blocked two entrances of the western Gate system, either wholly or partially, when the Harappans were on the Defensive." This view of Wheeler is questioned by Sri S.D. Singh on the assumption that the elaborate defences at Harappa and Mohenzo-daro, with lofty citadels, gateways and watch towers, can not be simply explained away as mere embankments against river floods. On the other hand, he says "they clearly, bespeak authority, as well as the need for defence against an alien enemy". According to him, the well planned urban nature of the cities, reveal "a measure of autocracy, and the "citadels presuppose a regular organization of defence".

Another site of the same period is Kālibhāgān which yielded 2 phases of fortification 1. Preharappan and 2. Harappan. In the first phase i.e. pre-Harappan, was built a wall, about 6' wide and later redoubled. The height of the wall is not known, as it was remodelled by the Harappans to suit their requirements. The second phase is marked by an identical fortification wall as at Harappa.
Vedic period:

The next important epoch, is the Vedic period, characterized by the appearance of painted grey ware and urban civilization coupled with advanced agricultural and pastoral economy and some sort of political organization of the tribal states called Janapadas, headed by a king or Rājan. During this period, although cities were rare, they were not altogether absent. On the other hand, we find references to cities like Kauśāmbi, Rājagrīha, Āhichhatra, Ujjain, Dwāraka, Indraprastha etc., in the literature of the period, termed as Pura, protected by ramparts, or walls made of heaped up earth or mud. The literature of the period i.e. Vedas, bear allusions to forts and fortifications of the period. Pura is a word of common occurrence, meaning a town or city surrounded by a rampart or stronghold. Durgā is another word that occurs frequently, meaning hard to approach or inaccessible. The terms Vapra and Dehi mean a rampart made of earth or dikes. The fortifications of the period, are described as of considerable size as (prithvi) broad and (udvi) wide. Stone Forts (asmamayi) and Metal Forts are alluded to. The later, probably refers to the strength of the fort, as against the literal meaning. Seasonal forts like (śaradī) autumnal are also referred to. Cattle pens, or strongholds with barricades of wooden outposts, for holding cattle from being strayed away, appear to be in existence, as understood from the term, Gōmate.

The Rigveda mentions Agni and Indra as destroyers of forts, and invokes them in several hymns to display their prowess and
destroy the forts of dasas or asuras. It even calls Indra as "Purafidara" \textsuperscript{53} i.e. fort demolisher or breaker down of forts. The Arthavana Veda describes forts of Gods as "impregnable with circles 8 and portals 9" \textsuperscript{54}

The above information of literature is corroborated by archaeological evidences brought to light through excavations at a host of early historic sites like Kaśāmbi, Ahichhatra, Ujjain, and Rājagriha, where were discovered rampart walls of mud with sloping sides and revetted with burnt brick, reinforced by bastions, and towers, square in plan, almost reminiscent of the Harappan citadel. Special Period III\textsuperscript{2} at Kaśāmbi revealed a curved entrance and a Stone Fortress, built of random rubble with well dressed stones providing facings to the two sides. According to the excavator, Sri G.R. Sharma \textsuperscript{55} three architectural phases are discernible at Kaśāmbi \textsuperscript{55}; the earliest built of random rubble, the second of dressed stones, and the third of brick core and Stone facings, indicating rebuilding. The first defences came into being, in SPI\textsubscript{3} before the arrival of painted grey ware. The earliest moat belonged to SPI\textsubscript{5} before the NBP (Northern Black polished ware) made its appearance. The defences from SPI\textsubscript{3} to SPI\textsubscript{12} followed a similar pattern, but in SPI\textsubscript{11} a curved entrance was added enclosing a corbelled underground passage. The latest phase at the site consisted of a stone fortress palace, occupying an area of about 1033 x 492 ft."
Similarly, Rājagrīha\textsuperscript{56} identical with the Girivraja of Jarāśāndha in Māhā Bhārata, is another fortification which goes back to a period anterior to 6th C. B.C. There are two lines of walls, encircling the city and the hills, up and down. Like Kaūsāmbi, here also, the outer facings of the walls are built of massive undressed stones, about 3 to 5' in length, carefully fitted and bonded together, while the core between them, consisted of smaller blocks carefully cut, and laid with chips, or fragments of stone. The thickness of walls varies from 14 to 17'6". Bastions were also added, which are rectangular structures measuring on plan 47 to 60'x34 to 40'.

Ujjain: in Madhya Pradesh is another fortified site of the same period. Excavated by Sri N.R. Banerjee\textsuperscript{57} it revealed continuous occupation of the site from a date prior to 6th C. B.C. to the beginning of Muslim rule in Mālwa, resulting in 4 successive periods from Pd. I to IV in a deposit ranging from 35 to 40'. The excavation also brought to light, the outlines of constructional details of the massive rampart, with a moat, dating back to the earliest period of occupation and the find of a painted greyware sherd in the core of the rampart. It was built in Pd.I by dumping the dug up yellow and black clays to form a thick wall, with gentle slope on the insides and less pronounced on the exterior. It was surrounded by river Sipra on the North and west, while there is the moat on the south and east. In Pd. II was added the brick wall, about 3'9" wide in front of the moat.
Epic Period: The two great epics Mahā Bhārata and Rāmāyaṇa also refer to contemporary forts and fortifications. The term Vapra and Chhāya are of frequent occurrence, to mean ramparts of earth or mud. The Adiparva of Mahā Bhārata refers to the city of "Indraprastha" as protected by a wide moat, lofty walls, and several gateways. The Aranyaka Parva contains an interesting account of defence against siege.

The city of Ayodhya in Rāmāyaṇa, which means impregnable or unassailable was surrounded by a deep and unfordable moat all round, guarded by huge gateways and towers. It was well provided with all kinds of weapons, and ample stores of rice, paddy, good drinking water, and all kinds of commodities. Kishkiṇḍha, the abode of Sugrīva, is a forest fort, provided with golden gates, moat and citadel. Lāṅka, the capital of Rāvana, was a typical mixed fort, furnished with 4 huge gates, and 4 bridges across the moat running around the town. The gates and bridges were provided with yantras or missiles like Śataghnī. On the basis of its situation in the midst of Sea, it can be considered as a Jala-durga or Nādeya fort, a Giridurga as it stands on the mountain Trikūṭaka, and a Krtrimadurga being provided with several artificial fortifications.

Buddhist literature:

The Buddhist Nikāya and Jātaka literature also furnish stray references to forts and fortifications. The Dīgha Nikāya mentions a border city defended by strong ramparts and towers and provided with a single gate, leading us to believe that border
cities of strategic importance were strongly fortified. The Saṃyutta Nikāya describes a city with iron walls and the Anguttara mentions the 7 requisites of a fortress and the supplies required for its maintenance. The Mahāummagga Jātaka states that the city of Vaṭāli was surrounded by a rampart; with watch towers near the gates. Between them were 3 moats (aūdaka) water, (paṅka) mud and a dry moat. Seize of a fort and a postern gate or side entrance are also alluded to.

According to Pāṇini, the most important parts of a city were moat (parikha) rampart (prākāra) and gates (dvāraśīh) which served as the main defences. The plan of the city was usually square but also rectangular, pierced with 4 gates one in the middle of each wall, facing the 4 quarters.

SECTION IV:

Early Historic Period:

During this period, which corresponds to the Imperial Mauryas of Magadha, we find that the art of fortification came to be practiced on a much larger scale. The political and military conditions of the period, in the face of foreign invasions from the Greeks, the Bactarians, the Scythians and the Pahlavas made it imperative for the various rulers of the period to strongly fortify their capitals. Perhaps, realising these external dangers, Kaूtilya, wrote his famous treatise on polity i.e. Artha Śāstra; in which he dealt with several aspects of administering the state, in detail. It was from this
period onwards, that literature on polity grew considerably dealing with the art and science of administering the state and emphasising upon the need for possessing a strong fort by a king, worth the name. In fact, the credit for assigning a place of importance and honour to forts in the body politic, as a politico-military institution, goes to Kautilya, who, for the first time included it among the seven constituent elements of sovereignty of the state or the Saptāṅga. This Saptāṅga or 7 limbs of the state, according to Kautilya, consisted of 1. king (Rājan) 2. Minister (Maṅtri) 3. country (dēśa) 4. Fort (durga) 5. Treasury (kōśa). 6. Army (bala) and 7. Friend (Mitra), and it became the guiding principle in later times, for almost all the kings to follow. According to him, the Durga (Fort) occupies 4th place, next, in the order of importance, to the king, Minister and the country.

With this background, about the definition, concept, antiquity and evolution of the fort, through the various periods, we shall now proceed to study the institution of Fort as conceived by Kautilya in his Arthaśāstra.

SECTION V:
Kautilya's concept of the Fort:

It has already been suggested above that, it was Kautilya, who first realised the importance of a fort in its true sense. According to him, it is only in a fort, that the "army and treasury are secure", and "it is a powerful defensive
instrument to the king in times of danger.® Hence, he enjoins upon a King, to erect forts not only around his capital but also on all the frontiers of the kingdom, in the 4 quarters. He divides forts into 4 classes (viz.) as aūdāka (water) Parvata (hill) dhānva (desert) and Vana (forest). Among them, he recommends water and Hill, as best suited to defend inhabited centres, whereas the other two are useful for those who live in uninhabited regions. As regards the plan or shape of a fort, Kautilya prescribes, either circular, (vṛitta) rectangular (dīrgha chaturasra) or square (Chaturasra). While choosing the site of a fort, he warns that care should be taken to see that it is not exposed to external dangers. Hence, he says that the capital city shall be in the centre of the kingdom, preferably on the bank of the confluence of rivers or a deep pool of perenerial waters.

The next important aspect that Kautilya deals with is the various component parts, or architectural adjuncts of a fort, the method of their construction, disposition, shape etc. According to him, a fort shall have 3 ditches or triple moat, (Parikha) outside the rampart, with an intermediary distance of 1 daṇḍa or 6' from each other, and 14, 12, and 10 daṇḍas in width, with a depth of not less than one quarter i.e. 1/4th of half of their depth i.e. 3' 6" or 2.5'. With in a distance of 4 daṇḍas or 24' from the inner most ditch, stands the high rampart (Prākāra) about 6' daṇḍas or 36' ft. high and twice as much broad i.e. 72' ft. This rampart, is to be built of heaped
up mud walls, square at the bottom and oval at the centre. In order to prevent free passage or movement of the enemies, he prescribes the plantation of thorny bushes etc. and any gaps shall be immediately filled up with fresh earth. Above the rampart, will be the parapet wall or vishkaṃbha, along the entire length of the wall, broken at intervals, which shall be even or odd in number, and built at a distance of 12 or 24' from each other, with a height of thrice their breadth; and built of bricks. Then comes the tower or Bastion (aṭṭālaka) which shall be square throughout, and provided with a movable stair case or ladder. The distance between 2 towers or bastions shall be 30 daṇḍas or 180' which is occupied by a broad street, with a covered roof. In between the tower and the street, lies the Indrakūsa or perforated screen, with seating accommodation for 3 archers. Lastly there shall be 4 gates in the middle of walls on all the 4 cardinal directions, which are 1/8th as broad as the width of the street.72

Kautilya then says that several roads like chariot path, elephant path, etc. are to be laid within the fort area. He also cautions that the approaches to the fort outside the rampart should be properly obstructed by causing the erection of Knee brakers (Jānubhaṅjani), a trident, eaṭṭh pits, thorny bushes etc.73

The rampart, according to him should have a bulge or projection about 1/2 hastas or 9' and provided with an entrance gate in the middle.74 Above the towers flanking the gateways, shall be turrets, built over the parapet wall, resembling on its front, the face of an alligator75. He also prescribes the
excavation of Kulyá (canal) for storing weapons which include spades (Kuddālaka) axes (Kuthāri) varieties of staff, cudgels (musīrunthi) hammers, (mudgara) clubs, (discus) machines (yaṅtra) and such other weapons as Sataghnī (100 killer missile), spears, tridents, bamboo sticks, and other explosive material.

Kautilya then discusses the various secular and religious structures that should be built within the fort. He says that, the fort area should first be demarcated and 3 royal roads laid down in east-west and North-south directions. There shall also be several other roads leading to the different areas of the fort. Then the fort should have 12 gates, with underground passages, provided with land and water. In the centre of the fort should be the royal palace facing North, or East, and occupying 1/9th of the whole area. Residential structures of the royal priests, ministers, water reservoir, shall be to the east by North of the palace. Royal kitchen, elephant stables and store houses will be on east by south. In the east will be the residences of merchants, expert artisans and Kshatriya caste. The treasury, the accounts office, and other various manufactories shall be on South by east. The Store House and Arsenal or Magazines will be on south by west. In the south will be the Superintendents of the city, commerce, and of the army. In the North, shall be the shrines of the royal tutelary deity and the residences of Brāhmaṇas.

In the centre of the city besides the royal complex, will also be the temples of Gods, such as Aparājita, Apratihata,
Jayanta, VaJayaanta, Siva, Vamana, Asvina, and the abode of Goddess Madira. In the corners are set up the guardian deities of all quarters appropriate to them.

The principal gateways named as Brahma, Indra, Sanya, and Senapatiya, shall be within a distance of 100 bows or 800".

The last item for discussion by Kautilya is the garrison which is important for any fort. He enjoins upon the authorities to store sufficient quantities of weapons and essential commodities such as oils, grains, sugar, salt, medicinal articles, dry or fresh vegetables, dried flesh, haystock, firewood, metals, skins, charcoal, tendons, poison, horns, bamboo, timbers, armour, and skins, in such a manner as they can be enjoyed for years together without feeling any want.

Finally he prescribes the erection of a passage for flight (prathavisikaru) in an unassailable part of the rampart, and a door for exit (nishkura dvaram).

The Artha Sastra of Kautilya is followed by a number of other works on polity, as Dharma Sastras, and Puranas, and Nitisara of KamaRaka, the Sukranitisara, and the Nitiwakyamritam of Somadeva Suri, the Manu Smriti, and the Puranas like, Matsya, Vayu, Brahmana, Agni, and Vishnu Dharmottara, all of which ascribe a place of importance to the institution of fort, and insist upon its possession by a king. For instance, the Manu Smriti, says that a king should have a fort, equipped with a spacious palace, habitable in every season, and well supplied
with water, weapons, money, grains and Brāhmaṇas, artisans, engines, fodder etc. It considers that a bow man placed on a rampart is a match for 100 foes and 100 bowmen for 10,000 foes.

SECTION VI:
Classification of Forts:

From a study of the various works on the subject like the Arthaśāstra, the Nītisāra of Kāmaṇḍaka, the Manusmriti, the Sukranītisāra, and the works on architecture (Vāstu) like the Mānasāra, the Mayamata, the Visvakarma Vāstu, and Śilpa Ratna and the Purāṇas, we find the following classification of forts.

Broadly forts are classified on the basis of 1. their situation 2. plan or shape and 3. the material of construction.

Of them the first i.e. situation formed the main basis of classification, for the various works on polity and the Purāṇas, with little variations.

To take up first the Arthaśāstra, we have already seen that it classifies forts into 4 kinds as,

1. Aūdaka: water fortification such as in island, in the midst of a river or a plain surrounded by low ground.
2. Pārvata: mountainous such as a rocky tract or cave
3. Dhānyaṇa: desert such as a wild tract devoid of water and over grown with thickets growing in barren soil.
4. Vana: forest: full of wagtail (Khaṇjana) water, and thickets.

Among them Kautilya considers water and mountainous fortifications as best suited to defend populous centres.
This classification is closely followed by Kāmandaṅka in his Mātisāra, including the terminology. But it adds one more kind of Kautilya's 4. They are 1. Ādhaka; (water) 2. Pārvata (hill) 3. Vārksha (trees) 4. Ārina (desert) and 5. dhāṇvana (wild tract). The first two are common to Kautilya. Kāmandaṅka appears to further divide dhāṇvana into two, on the basis of subtle difference only. From this it can be seen that the first two kinds agree with Kautilya, while the Third i.e. Vārksha replaces Kautilya's Vana; and the 4th Ārina is an addition to Kautilya. The distinction between the last two appears to be subtle, the former i.e. Ārina meaning an area devoid of wells while the later i.e. dhāṇva is uninhabited region.

The next work that draws our attention is Manusmṛiti, which classifies forts not only the basis of their situation but also on the basis of the materials of construction, and the methods adopted for protecting it. They are

1. dhāṇva: desert surrounded by a wild and waterless tract with in a radius of 5 yōjanas.
2. Mahi: built of either stone, or brick rising up to 12 hastas high, and useful for purposes of war and provided with entrance gates, spacious courtyards, and surrounded by high ramparts.
3. Ab: water encircled by deep waters, as deep as nether world below.
4. Vārksha: surrounded by high trees, wild and thorny bushes, creepers etc. extending over 1 yōjana alround.
5. Nri: troop fort consisting of elephants, horses, chariots and foot soldiers who protect it on all sides.

5. Giri: situated on the top of inaccessible hill, having only one impassable entrance, with water inside and fruit bearing trees.

Of the above 6 kinds, the Manu Smriti considers the last i.e. Giri as the best, it being distinguished by many superior qualities. This classification also shows little difference from the two earlier works, which is only in terminology rather than any substance. It adds 2 more kinds to the already existing 4 i.e. Mahi and Nri.

SukranItisāra shows considerable deviation from the earlier works, and adopts an 8 fold classification, taking into account the different parts of the fort. According to it, they are:

1. Parikhādūrga: surrounded by great ditches (moat) on all sides. Hence Parikha fort.

2. Parigha: protected by high walls of stone, brick or mud.

3. Vana: encircled by thorns and clusters of trees

4. Dhānva: devoid of water

5. Jala: encircled by great sheets of water

6. Giri: Hill fort situated on a high level on the top of a hill and provided with plenty of water

7. Sainya dūrga: troop fort defended by heroic soldiers


The above classification of SukranIti shows that it adds 4 more new kinds i.e. 1, 2, 7 and 8 in addition to the traditional
4 kinds i.e. 3, 4, 5 and 6. Like the previous ones, it also considers Giri as the best. Their relative order of merit according to it is, Parikha, Alrina, Parigha, Dhānva, Jala and Giri.

The next work that has a bearing on the subject is the Brihatsamhita, which considers forts to be of 3 kinds. They are Giri (hill) Salila (water) and Ātavika (forest).

The Nītivākyamrita of Sōmadēva Sūri adopts an altogether a different classification. According to it forts are of two kinds (viz.) Svābhāvika and āhārya (natural and artificial). The Svābhāvika forts are those endowed with natural facilities like high hills, water resources, etc., while the āhārya or artificial are provided with ramparts, missiles, fire weapons, food grains, chemicals, and entry and exit ways strictly guarded by adept soldiers. Bhoja's Yuktikalpataru also has more or less similar classification as akritrima and Kritrima, natural and artificial.

The Mānasollāsa or Abhilashitārtha Chintāmaṇi mentions 9 kinds of forts, but specifies only 4. They are Savila, Vana, Maru and Nara.

The next class of works that come for study is the Purānic literature. Among them, the Matsya mentions kinds of forts, which are the same as Manusmriti. The same is the case with Agni, Vāyu and Vishnu Dharmottara. The Mārkaṇḍeya Purāṇa has 4 kinds of forts according to which 3 are natural and 4th artificial.
From the above study of different works or rājanīti or polity and Purāṇas, we find, forts broadly fall under 4 heads; as 1. Sthala; situated on a plain terrain, Giri: hill, Vana; forest, and Jala: water, irrespective of other minor varieties. Another point is that, among them Giri or Hill gained universal respect, in view of its superior strength.

The second basis for classification is the general shape of plan. This is done by several treatises on architecture (Vāstu) apart from a few works like Artha śāstra, and the Purāṇas like Matsya, and Vishnu Dharmottara.

According to Artha śāstra, a fort may be circular, (Vṛttā), rectangular (dīrgha chaturasra) or square (Chaturasra) in shape or plan.

Among the architectural works that deal with this aspect of classification, are the Mānasāra, the Mayamata, the Viśvakarma Vāstu, and Śilpa Ratna.

The Mānasāra while dealing with Grāma and Nagara Vinyāsas, i.e. formation and lay out of village, town and city, prescribes 8 forms, which should be heavily protected with ramparts, ditches, gates, towers etc. It also equates a city with a fort and vice versa, and does not draw any distinction between the two, for, every city was invariably fortified. They are

1. Daṇḍaka: (that which resembles a staff) quadrangular in shape, surrounded by a square wall having 4 gates, one on each
side, and as many smaller ones at angles. It should have the
temple of Vishnu, in the quarter presided over by Varuna or
Mitra, of Śiva in Adita or North east and Chāmunda near the
North gate.
2. Sarvottobhadra (strong from all sides): Also quadrangular in
form, with a ditch around it, and 4 large and many smaller gates
in the middle at angular points.
3. Nandvāvarta (abode of happiness): Square or oblong in shape,
with the interior divided into 4 quadrants having 3 to 7 streets
in each.
4. Pādmaka: (Resembling a lotus flower): Adopted for laying a town
with a strong fortress all round with a ditch and rampart. It
will have 4 corners, and faces 8, 12 or 16 usually square or
circular in form.
5. Svastika: (a mystical figure) Also provided with a moat
and rampart, and 2 entrance gateways one in each face in the outer
wall thus making 8 in all.
6. Prastara: (protuding shape) may be square or rectangular. But
not circular or triangular. It should have 4 central gateways.
7. Kārmuka: (Bow type) Semicircular
8. Chaturmukha: having 4 faces or gates either square or rectan-
gular oriented from east to west.

The above classification of fortified towns and cities
is based on the site selected for the purpose; and the size of
the city or town. In addition to the above, the Mānasāra, has
another division of forts into 8 varities, more on the basis of
their function or nature. They are

1. Śibira: royal camp
2. Vāhinī Mukha: Military station or base, away from the battlefield
3. Sthāniya: capital city or local fortress
4. Drōnaka: that which is near water
5. Saṁviddha: nature not clear. Probably it may mean that which bestows success
6. Kōlaka: situated in a hilly or wild tract
7. Nigama: out post for vigilance
8. Skañdhāvāra: military enampment

This functional classification of forts corresponds more or less, to the modern classification into imperial or capital forts corresponding to the capital cities of kings where they reside, cantonment forts situated at central points in the kingdom to meet its military requirements in times of need and frontier outposts on the borders of the kingdom meant to prevent incursions of the neighbouring enemies. This classification does not show any architectural forms.

A third type of classification made by Mānasāra, is according to their nature from military point of view. They are 7 kinds.

1. Giri: sub-divided into 3 kinds as Giri Prāntāra, situated on the top: Pārvata SamIpaka: in the vicinity or near the foot of the hills and Parvatāvrita Madhyē: in the midst of hills.
Vana : Forest
Jala : encircled by sea or water
Paṅkadurga : clay or mud fort
Ratha durga : chariot fort on the battle field
Dēva durga : Divine fort, protected by Gods; through chanting of hymns, and artificial contrivances.
Miśra durga : mixed fort having a combination of more than one of the above features.

The second work of this category that deals with the classification of forts is Māyamā. It also equates a fort and city and divides them into 14 kinds as Grāma - village, Khētaka, Khārvata, Durga, Nagara, Rājadhāni, Paṭṭana, Dronakamukha, Śivira, Skaṇḍhāvāra, Sthāniya, Vihambaka, Nīgama and Sakhānagara. Most of these are similar to the Mānasāma. It classifies forts into 5 kinds on the basis of their plan, as square (chaturasra) rectangular (oblong or dīrgachaturasra) vṛitta (circular) elliptical (vṛttāyata) and Gōlavṛitta (completely circular). Another criterion adopted by it to classify forts is their area or size. Accordingly they are of 3 kinds, as the smallest, middle and largest having 604, 704 and 768 dandas respectively.

Viśvakarma Vāstu is another treatise that deals with the subject of classification of forts, which according to it, are of 12 kinds. Its classification, cannot be said to be based on their architectural shape or plan. On the other hand, it follows the age old premise, of classifying forts on the
basis of their situation. But in doing so, it classifies them into a number of minute varieties. They are

1. **Giridurga**: Hill Fort. Like Mānasāra, it divides them into such varieties, as, Giri Sānu, Giri Madhyā and Giri Mūrdhni, meaning that which is situated on the slopes of hills, in their midst or at their foot. Faces either east or North protected by well armed soldiers.

2. **Vanadurga**: Situated in the midst of deep woods or forest.

Of 3 types Ūrdhva: situated on naturally high land, 2. Bhūdurga, situated on ordinary plain. 3. Āntastha: dependent upon underground secret ways or subterranean passages.

3. **Salila**: water fort, surrounded by a great sea or river, with underground passages, chariots, and walls.

4. **Airīna**: desert fort; surrounded by waterless tract, impossible and unbreakable.

5. **Daivata**: diving fort that which has land routes endowed by natural facilities like valleys, ditches etc.

6. **Ekamukha, Dyumukha and Chaturmukha**: that which is built on the river bank or slopes of hills, should be square with one only entrance way. It should have a deep moat, unfordable for the soldiers, high gateways, sally ports and rampart, in the midst of which should stand the palace of the king, the residences of ministers etc. It should also have granary, treasury, and a number of towers with only one entrance in the east, and in case it has 2 entrances, one each should be in the South and North. It has 4 gates, which may be on the 4 cardinal directions, and stair cases to the walls should be built.
9. **Karmuka (Bow-type):** Can be erected in the midst of a forest or on the slopes of hills. May be built of either brick, wood or cloth, provided with underground passages and missiles. Mud or clay may also be used. Temporary in nature.

10. **Prabhu (King's fort):** Should be built in the midst of a fort, or hill slopes, which is in accessible, surrounded by deep moats; should have only one entrance and 12 ramparts, with towers and turrets laid down in the interior. It should have 4 faces and entrances, provided with Pratōlika and Šataghnis. Entrances should be either in the east or north. There should also be structures to sound alarm called Karṇas and gates with in the gates (upādvāra).

11. **Yuddhadura (War fort):** Meant for attacking an enemy from a safe place. A site of 6 angles or 8 angles is suitable.

Yet another work that divides forts into various classes is Silpa Ratna. According to it, forts are of 7 kinds (viz.) the mountain, the forest, the water, the Aīrīna, the daivika, the dhānva, Kṛitaka or artificial, in the order of their relative superiority. While the first 6 classes, mean the same as in other works, the Divya or Daivaka denotes a different fort from the above. While according to them the Divya or Daivaka is one which is natural, according to Silpa Ratna, it is one which is protected by deities like Indra, Varuṇa, Guha, Jayanta, VaIjayahta, Aśvini dēvatās, Śiva, Durga, and Sarasvati. This
shows close similarity to Artha Śāstra which prescribes the shrines for the above deities. According to this work, the site of a fort may be either triangular, square, circular, rectangular, or they should resemble a segment or sector.\textsuperscript{103}

From the foregoing study of the different works on Vāstu, we find that the classification of forts depended primarily upon the site chosen and secondly, on the shape or plan of a fort. Broadly the shapes prescribed for a fort, are circular (vṛitta) square (Chaturasra) rectangular (dīrghachaturasra) or oblong, and semi circular (or vṛttāyata). In this context, may also be noted, what Vishnū Dharmottara has to say on the subject. According to it, while a fort may be Āyata, chaturasra, or vṛitta, triangular and oval are of no avail; Semicircular and Vajrākāra, that which resemble a discus or wheel, are to be avoided.\textsuperscript{104}

The third basis for classification noticeable from the above works is the material of construction. The Manusmriti and Mānasāra mention Mahī and Paṅkadurgas, built of brick, clay or mud.\textsuperscript{105} The Mānasōilāsa holds that Giri and water forts should be built of stone, brick or mud, where as Vana and Maru may be built of wood.\textsuperscript{105}

**Methods of attack and capture of a Fort:**

Of all the works on polity, and military science, it is only Kautilya, that provides sufficient information as regards the methods employed for attacking a fort and capture it. He enumerates, 5 methods (viz.) Upjāpa, intrigue, Apsarpa (pretending retreat or spies, Vamana (wining over people) Paryupāsan (siege) and Ayamarda (general assault).\textsuperscript{107} While attempting to capture enemy's fort, the first method to be employed is sowing
seeds of dissension in the rival camp by giving publicity to his own power of omniscience and close association with deities, and thus threaten the enemy camp. This may be carried out by pricking up traitors whose nature is found out through a body of adept spies and pretention of his knowledge of foreign powers by means of his capacity to read omens and other signs, invisible to others. The second part of intrigue i.e. proclamation of his divine nature may be done through a body of spies, who pretend to be Gods and converse with them by employing secret mechanical contrivancies like under ground tunnel. This may also be done by giving wide publicity through astrologers, sooth sayers, horologists, story tellers, etc. in the enemy's territory. Kautilya also says that the enemy should be characterised as an ordinary man of inferior qualities, like a donkey towards skilful persons etc. Having done this, the conqueror, may attempt bribery, by way of offering money and food to those who are in need of it, and ornaments. He may also take advantage of the natural calamities like famine, thieves or wild tribes or general unrest, prevailing in the enemy's compound thus force them to seek his help.

The second method suggested by Kautilya is to pretend retreat; temporarily, and attack all over once again the enemy with reinforcements, thus taking him unawares.
The third method i.e. siege is resorted to when the first two methods fail to evoke favourable results. The siege i.e. direct attack against enemy's fort is preceded by some preliminary preparations. Before attempting it, the conqueror should first satisfy himself about the plentiful availability of his own stores, like commodities, raw materials, machines, weapons, dress, labourers, ropes, and the like and act in a favourable season, while the enemy should have an unfavourable climate, suffering from disease, famine, loss of stores and defensive weapons; and when his troops as well as those of his friend are in a miserable condition. The second stage of a siege is to sufficiently guard his camp, transport, supplies and roads and communication. After this he has to raise a temporary fortification around his camp by digging a moat and raising a rampart. Then he has to empty the moats around the enemy's fort or fill them up with water if dry, and cross them by way of erecting draw bridges. Having done this preliminary work, the besieger has to assail the rampart, and parapets by making use of underground tunnels and iron rods. The moat, if deep, should be filled up with earth, and force his entry through the gate, and crush the enemy's forces.

The second method of siege is by employing fire. The use of fire, as a means to capture fortresses, according to Gustav Oppert, is a well established practice. According to him "the oldest documents mentioning and describing Gun powder are found
in India, and written in Sanskrit, and that the use of Gun powder and its application to the discharge of missilies from projectile weapons, was a well known fact in India. He also says that the term used for gun, is nālika, derived from the word nāla (nāla) a reed or hollow tube. These projectile weapons formed like tubes and were therefore called cannons, from cannon-a reed. Kautilya, says that, birds like Vulture, crow, naptr, bhasa, parrot, maina, and pigeon, which have their nests in the fort walls, may be tied to their tails with inflammable powder like Agniyoga and then allowed to fly to the forts. Similarly, the spies, acting as watchmen of the fort, may tie in flammable material to the tails of mungoes, monkeys, cats, and dogs, and thus set fire to the thatched roofs of the houses. Among other fire weapons that Kautilya prescribes are, small balls, prepared from the mixture of Sarala (Pinus Longifolia) devodani (deodar) pūtirina (strinking grass) guggulū (Boellium) Srivertataka (turpentine) the juice of sajja, (Vatica Rolusta) and Laksha(lac) combined with the dungs of ass, sheep, goat, which are inflammable (agnidhāraṇaḥ).

The ingredients of Gun powder to be hurled against the enemy, is prepared, out of a mixture of priyala (chiranjia Sapida) the charcoal of avalguja(oamyza, servotuha, anthelnnincta) madhūchhīṣṭa (wax) and the dung of a horse, ass, camel and cow.

Another kind of Gun powder, is prepared out of smelting metals (Sarva loha) as red as fire, and mixed with the powder
of Kumbhi (Gnelia arborea) Sisa (lead) traph (zinc) charcoal powder of the flowers of the paribhadraka (deodar) palāsa, (lutea from dosa) and hair, and with oil wax, and turpentine.

Among the weapons that Kautilya describes are Viśwāsaghātī and Sataghni. According to him, this fire method is to be resorted to in the last, when all other methods prove in effective.

The fourth method of Siege is storming. Kautilya says, that when the besieger is fully satisfied about the availability of weapons, forces, and when the enemy is in distress, through unfinished forts, deficient stores, and absence of allies, then, he should consider it as opportune moment to storm the fort, by cutting off supplies and communications, and from the fort, i.e. ingress and digress, for a prolonged period, thus forcing the besieged to come to terms and surrender the fort.

The 5th method of seiging a fort, prescribed by Kautilya, is general assault by leading the forces in large numbers suddenly and besiege the fort, taking the enemy unawares, at a time when his forces are weary out of daily engagements on the field, or when they are in a fully drunken state, and thus reduce the enemy garrison by killing or taking them prisoners.

Lastly Kautilya prescribes two pronged attack both from the front and the rear dividing his forces into two divisions or taking the help of an ally and thus herm the enemy fort in between on the both the sides and reduce the enemy to surrender.
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