THE CHANGING PATTERNS IN DEFENCE TECHNOLOGY

In the study of the growth of defence architecture in the area under study, significant would be changing patterns of defence technology commencing from Pulakeshi-I to Tipu Sultan. More than other area, Badami emerged as an important centre primarily due to its strategic location. In the region Badami alone has tall hills and red sand stone which not only provided excellent material for defence architecture but also natural protection. Fort construction on the rugged hills commenced from 6th century A.D. and went upto 18th century A.D. Consequently they were different noticeable or distinctive developments.

THE FIRST STAGE (6-8th CENTURIES A.D)

The earliest fort architecture at Badami began during the reign of Pulakeshi-I. The fort at Aihole, Badami, Pattadakal, Mahakuta all belong to the early Calukyan period including one of Alampur which is presently in Andhra Pradesh. These have been discussed in the previous chapter.

By sixth century, the Badami Chalukyas on the decline of the Kadambas were able to establish political authority and extended their kingdom gradually over north Karnataka. With regard to the fort construction during the reign of Pulakeshi on the Northern Hill an inscription of 543 A.D., describes the characteristics of the fort. It says

1 KI. Vol no- II, no 2 Plate and PP-6-7 and EI. Vol. no- XXVII PP-6-9
that the fort was inaccessible both from the top and the bottom. The Northern Hill
popularly known as Bhavan Bande measures 52 boulders. Being a military genius,
Pulakeshi covered the gaps between the boulders especially at the base level by filling
them with smaller stones. The cyclopean method that is adopted involved filling up the
stones one over the other. A fortified wall came to be constructed only at the top level,
which is a flat area. This method naturally involved minimum fortification effort. This
eyear fort has five gateways all fixed during the period of Pulakeshi-I. While the interior
of the fort appears to be of earlier period, the exterior portion of the gateways has been
modified from time to time. A close observation indicates the whole of Badami
northern hill is a cluster of boulders.

Fig. 6.1 Satellite Picture of Northern Fort

Courtesy: googleearth.com
The entire hillock with several narrow openings and smaller gaps is rather complex and makes it difficult to access. However, best advantage was taken of these to create secret passages which even an enemy on invasion would desist their advancement.

The Chalukyan fort at Badami displays substantial advancement in the defence architecture. The very selection of the region or place for the construction of the fort on the steep sided hill top points is to make a considerable progress in war techniques. There is no evidence of a clear idea about the definite devices used. Nevertheless, the sculptural depictions on the walls of the temples, on the veergals, illustrate the range of weapons used in this phase.

Fig.6.2 : Weaponry as seen in the Sculpture of Chalukyas

The swords appear to be heavy and arrows look like spears may be effective even in striking, besides may be seen clubs, Shields and so on. Sheelakanth Pattar has identified five types of weapon based on the depictions in Chalukyan sculptures.

1.1 Shooting weapons - there are various types of bows of one bend, two curves and three curves;
1.2 Flinging weapons - Eeti or spear – long stick with sharp head;
1.3 Piercing weapons - small sword – also known as Kattari, and Trishula;
1.4 Hitting weapons – also known as Danda and Gade ;
1.5 Cutting weapons – Kadga, Machu , and Kodali , sword, axe etc ;

Of the defensive weapons important is the sculptures of the Badami Chalukyas are three types of shields - circular, oval and Rectangular.

Fig. 6.3; sculpture depicted fort attack on veeragals

Courtesy- Shastri Shesha: Karnataka Veeragallugalu, 1982, Kannada Sahitya Parishat, Bangalore, Plate no 57-58

All the four forts of the Chalukyas of Badami –Aihole, Badami, Pattadakal, Mahakuta or even in Alampur are all architecturally features are similar in pattern. In as far as the bastions are concerned Aihole, Badami and Alampur have similar shaped

\[2\] Ibid, PP - 134-135
square bastions, while Pattadakal and Mahakuta have bastionless walls. In Pattadakal fortified wall covers both the civic and the temple area and in Mahakuta only the temple area is fortified.

Fig. 6.4 : Chalukyan fort wall around Lower Shivalaya

The fort wall surrounding lower Shivalaya on the vertical scarp is 55 meters which is too high for aiming and shooting arrows the most familiar weapons during the period of early Chalukyas. As explained in Chapters IV the gateways are very massive and complex in nature.

The natural passages hinder an easy movement on entry into the fort without a prior knowledge of the plan. Enemies could have become easy target as they would get easily scattered being ignorant of the topography of the place. Lateral movement was also made impossible due to the terrain of the rock particularly on the northern hill chosen by the Pulakeshi for the construction of the fort. The Chalukyas made the best use of the natural protection as hill on the edges itself acted as a bastion, rather a natural bastion.
The northern hill actually projects from the Kalagi hill range and appears as though separated from it. It is the genius in selecting the fort by Chalukyas that becomes significant, as the later dynasties down to Tipu continued to prefer Badami itself speaks volume for the strategic location and the protection it extended naturally. For purpose of construction locally quarried stone was applied. Even now chisel marks are found on boulders at the eastern side of the fort, opposite to the Khileda Hanumappa gudi

**Fig. 6.5 : Chisel marks on the boulders near Keleda Hanumappana Gudi**

During the early phase, no binding materials were used in the construction. The piling up of the stone both big and small speaks of the skill as till date the piled up stone continue to remain intact. In this cyclopean method of fortification noticeable are the uneven sizes of the stones blocks, both in the horizontal and vertical orders.
Pulakeshi built fort is the best example for Giri Durga with minimum effort with maximum utilization of natural resources.

Fig. 6.6: Pulakeshi fort pattern of Northern Hill

Fig. 6.7: Depiction of Army supply during war time

Courtesy: Shastri Shesha: Karnataka Veeragallugalu, 1982, Kannada Sahitya Paritshat, Bangalore, Plate no 68
CHAPTER VI: THE CHANGING PATTERNS IN DEFENCE TECHNOLOGY

THE SECOND STAGE (10th-11th CENTURIES A.D)

With the decline of the supremacy of the Early Chalukyas, Badami attracted all successor powers. The Rashtrakutas during their reign taking knowledge of the economic importance of Badami strengthened not only the existing fort but also constructed a new one at the foot of the hill as discussed in detail in Chapter V. The fort wall was raised down the steep of the north hill at the southwestern point touching the Agastya Tirtha tank. The device adopted here is different from that of the hill fort as it is a Neladurga or Ground fort.

The actual site of the fort in the plain area indicates that there was noticeably distinct advancement in war techniques as seen in the building of the wall. The wall has a number of projecting angle and rectangular bastions. The wall constructed adjacent to the Agastya Tirtha stretches up the hill but below Tipu’s bastion. The wall served the purpose of effective defence. The binding technology used for the walls are clay and pebbles beside small sized stones which are quite visible. The back of the wall is rather broad as it measures 4 meters at the ground level and tapers towards the top part, which is 2 meters wide. During 10th and 11th centuries several new techniques were evolved in the building of forts such as increase in the in the height of the fort wall, wide moats, bastions with battlements, parapet wall and a walk path. A veergal of 12th century depicts the fort, papapet wall and the army.

On the parapet are portrayed swords, shields, bows and arrows. These Veeragals gives a fairly good idea of the various types of weapons used in wars such as Kadga, Katari, Barge, Baku, Sabala Kotna, Kakade used in wars.

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3 Shastri Shesha: Karnataka Veeragallugalu (1982): Kannada Sahitya Parishat, Bangalore
Fig. 6.8: Bargi, Baaku, Sabala Kotna, Kakade used in wars

Courtesy: Shastri Shesha: Karnataka Veeragallugalu, 1982, Kannada Sahitya Parishat, Bangalore, plate no 34

Fig. 6.9: Various types of Swords of Karnataka Katrai, Kadga.

Courtesy: Shastri Shesha: Karnataka Veeragallugalu, 1982, Kannada Sahitya Parishat, Bangalore, Plate no. 36
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Fig. 6.10: Early Shields of Karnataka

Courtesy: Shastri Shesha: Karnataka Veeragallugalu, 1982, Kannada Sahitya Paritshat, Bangalore, Plate no 30

Fig. 6.11: A Huge Bastion of Rastrakuta period

The fort wall is provided with the gateway on the west. The gate appears to be the main entrance facing south hill. The door frame of the entrance is enclosed partly by the projecting walls on the sides which act as buttresses. The gateway is actually a
pillared mantapa having four pillars. On the either side of the gateway is bastion. In the
earlier fort while no provision was made for climbing bastions, under the Rasthrakutas
flight of steps were added for the first time, indicating advancement in the defence
technology. The bastions were built with huge blocks of stones and smaller block were
used as it tapered upwards. In between the stone blocks, clay and pebbles were used as
binding material.

THE THIRD STAGE (15th-16th CENTURIES A.D.)

Under Vijayanagara from time to time forts were constructed and renovation
undertaken. It was during the reign of Hari Hara a small fort wall was raised near
Agastya Tirtha on the northern hill. Circular bastions were constructed and for the first
time circular bastions were introduced at Badami. Sadashivaraya also constructed a fort
connecting the northern and southern hills, though no bastions were attached.

Fig. 6.12 : Fort wall of Sadashivaraya on the bund of Agastya Tirta
An extensive fortified wall connecting the two hills and covering the entire Badami town was erected by the chieftains Krishnappa and Kondaraja, at the instance of Achyutaraya. Here too circular bastions were constructed at regular intervals. Significant in as far as Vijayanagara period is concerned is that again for the first time a moat was dugout at Badami. The stone blocks used for the moat are arranged systematically. The fort walls including that of the bastions have rectangular blocks which are roughly dressed but neatly arranged. This fort connecting the northern with the southern hill is 1175 meters.

By 15th century highly advanced war equipments such rifles and cannons came in for use. These were due to extraneous influences such as of the Mughals in the North and the Portuguese and the Dutch in the South India. But such developments though found at Bijapur and Bidar were not to be seen in Vijayanagara. This is well evident in Badami, despite its proximity to Bijapur where even traces are not available.

Fig.6.13: Bastion at the base of Southern Hill towards west direction

FOURTH STAGE – 18TH CENTURY

During this period as already discussed, besides a strong fort, renovation of Pulakeshi’s fort was undertaken. In the construction ashlar masonry was adopted for the first time during the reign of the Mysore sultan. Circular bastions and demi-bastions were built during the period. On the southern hill where the new fort was erected the narrowest passage naturally available the between the boulders to reach the flat surface at the top of the hill was chosen. This was a military tactic to avert the enemy attack. The two gateways one at the bottom beside the cave no III and another gateway about 100 meters are both very narrow, so also the pathways in the inside of the gateway are so narrow that they make it inaccessible for a big force to troop in at a time.

Fig. 6.14 : Gateway no 2 in a steep valley on Ranamadala Hill, Badami

The steps are also made very steep, narrow and uneven so as to deter the enemy. The natural rock formation is best utilized for purposes of defence. New weapons were introduced for the first time and this is well evident in the architectural development in
the forts. In addition to the traditional bows and arrows, swords and shields, guns, mortars or short-barreled cannons for short distance firing, large sized cannons fixed on carriages came into usage. One significant advancement was the manufacture of rocket technology which came in for extensive use during the wars.

**Fig. 6.15 : Mysore Rockets used in 18th Century**


For storage of arms of arms and ammunitions, magazines were constructed in the Badami fort on the northern hill, which speaks of the new technology of warfare having been introduced even at Badami.

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Alongside the fort walls were constructed parapet with loopholes. It not only gave coverage for the troop stationed inside the fort, but also strengthened the fort walls. Bastions were another important part of the fort. Tipu’s bastions were usually circular in shape and this feature was common in all the fortification of Tipu’s period. Compared to the earlier bastions of Badami, that of Tipu is wide, strong and spacious. This was essential as cannons were widely used. The banquette’s that is the elevation of earth within the fort usually three to four feet wide from the top of the parapet was also strengthened. Adjacent to the parapet was a walk path constructed for the first time for the movement of infantry and supply of arms and ammunition.

Demi bastions were built in spaces where regular bastions could not be constructed. Two such bastions are found on the extreme northern side of the fort. In all probability mortars and guns were used.
Fig. 6.17: Parapet wall of Southern wall, Badami

Introduction of new weapons compelled a change in the fort architecture. The height and thickness of the walls, parapets were increased.

Fig. 6.18: Cannon on the Northern Hill
Fig. 6.19: Cannon on the southern hill

Fig. 6.20: Guard room with a window on the Southern Fort of Tipu
Badami thus witnessed four significant stages of development and changing patterns of defence architecture from the 6th to 18th century. Each face had a distinct architectural characteristic which are visible in the remains of the original fortifications as well as in the renovated and reconstructed fort walls.