CHAPTER 2

ANALYSIS OF VIMANAS DESCRIBED IN CLASSICAL TEXTS
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2. ANALYSIS OF VIMANAS DESCRIBED IN CLASSICAL TEXTS

2.1. Introduction

The concept of aerial mode of transportation is something which has fascinated many of our ancient classical scholars. There are many ancient literary works which describe flying machines or Vimanas. We really don’t know whether these descriptions are real or imaginary. From a literary perspective, our great epics the Ramayana and the Mahabharata are Kavyas. Kavyas need not be real. Some people believe Ramayana and Mahabharata as history, but many consider the same as mere imagination. We do not have authentic proof to prove many points described in our ancient texts. Whether the description is real or imaginary we have to appreciate our ancient scholars for these wonderful contributions by them.

2.2. Aerial chariots described by Maharshi Valmiki in Ramayana

Maharshi Valmiki is the author of our great epic Ramayana. The Ramayana is a wonderful epic which narrates the story of an ideal prince Rama who goes on fourteen years exile to fulfill the promise made by his father Dasharatha to his step mother Kaikeyi. During his exile demon king Ravana abducts his wife Seetha, the entire story is about how Rama takes the help of Vanaras to identify where Seetha is and wage a war against Ravana, kills him and returns back to Ayodhya with Seetha, Lakshmana and all others who had supported him. Valmiki has beautifully narrated this epic poem in 24000 verses. In this research, we are interested in the study of descriptions of aerial chariots described in the Ramayana. The author has described amazing aerial chariots like “Pushpaka Vimana”. He has described as if the aerial mode of transportation was very common in Lanka in those days as it was a very rich city. How could someone think of such Vimanas or aerial chariots? Was aerial mode of transportation prevalent during that era? Even if Valmiki could imagine such an aerial chariot, what was the basis for his imagination? Like this there are many questions for which we still have to find answers.

2.2.1. Aranya Kanda

Aerial chariot is described in the Ramayana in Aranya Kanda when Ravana abducts Seetha. Valmiki has described it as a miraculous aerial chariot with two miraculous mules and
built with golden wheels. It is designed to appear and disappear braying noisily in front of Ravana based on his wish as described in the shloka below.

स च मायामयो दिव्यः खर युक्तः खर स्वनः |
प्रत्यहुष्यत हेमांगो रावणस्य महारथः || ३-४९-१९ (Valmiki, “Ramayana - Aranya Kanda, Sarga 49”)

It is represented as shown in the figure below.

![Figure 2-1: Aerial chariot of Ravana](image)

Here the important aspect which we can concentrate on is “the aircraft is designed in such a way that, it could appear and disappear based on the wish of its master.” The text Vymanika Shastra describes three types of Vimana, Maantrika, Taantrika and Kritaka Vimana and Pushpaka Vimana belongs to Maantrika category. This means our ancient people had the power of chanting the mantras and managing the flight of aircraft. They might have managed the visibility of aircraft using their mantric powers. A wild guess of possible technology behind this is by chanting the mantras/command aircraft might get coated with Camouflaging material which makes it invisible. Vymanika Shastra even describes two secret features like Goodha and Adrishya to make the Vimanas invisible. These are described in further sections of this thesis where Vymanika Shastra is discussed in detail. This feature can be conceptually compared to Stealth features in modern aircraft. Our research article titled “Probable technologies behind the Vimanas described in Ramayana” (Shruthi.K.R. and Rajani Jairam 2016) published in the June

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5 Religious print of the scene, by S. S. Brijbasi, Delhi, 1960's. Source: ebay, Jan. 2006
2016 issue of International Journal of Engineering Research and Applications describes this in detail. Stealth technology is useful in not only for hiding the aircraft from radar, but also partially even with human eyes. Nano enabled coatings used on the aircraft makes them invisible. Some military aircraft are painted in such a way that they match the sky when viewed from below and match the ground when viewed from the top. These camouflage and suppression techniques help in decreasing the flight vulnerability to missile attacks, for example, by reducing the radar reflectivity by using nonreflecting materials and radar absorbent paints.(Shaw 1985:55)

Some of the best examples of camouflaged aircraft are shown below.

Figure 2-2: Camouflaged aircraft, F-16s flying in the Negev Desert.⁶

Figure 2-3: Camouflaged aircraft, F/A-18 which blends to the desert background.⁷

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2.2.2. Sundara Kanda

We next find the description of pushpaka vimana in Sundara Kanda, where Hanuman describes the beauty of the Pushpaka Vimana when he enters the inner city of Lanka in search of Seetha.

चल आहायम् नाम विराजमानम् |
रत्न प्रभाभः च विवर्धमानम् |
वेश्म उत्तमानाम् अषि च उच्च मानम् |
महा कपिः तनं महा विमानम् || ५-७-११ (Valmiki, “Ramayana - Sundara Kanda, Sarga 7”)

Pushpaka vimana is described as the best among the best aerial cars, shining with the rays of precious stones and capable of travelling long distances. Royal interior decorations of Pushpaka vimana are beautifully described in Sundara Kaanda. The eighth sarga of Sundara Kaanda has seven shlokas which describe the beauty of pushpaka Vimana. It is described that Hanuman himself was stunned at the sight of pushpaka vimana due the blaze of diamonds and other precious gems. Vishwakarma who is considered as the manufacturer of this aerial chariot has described this as the one without comparison in beauty. Each and every minute part of this aerial chariot has great significance and is designed with great efforts. An important shloka from the point of view of this research is quoted below.

तपस्तमाधानपराक्रमार्जितम् |
मनःसमाधानविचारचारिणम् |
अनेकसंस्थानविशेषनिर्मितम् |
ततस्सततसुल्लतविशेषदर्शनम् || ५-८-४ (Valmiki, “Ramayana - Sundara Kanda, Sarga 8”)

It means, this vimana is obtained by severe austerities and valour and it moves by the ‘thoughts of the concentrated mind’ and this Vimana is made from significant parts collected from all over the world giving equal prominence to its appearance. Here the interesting point for us is, this vimana moves based on the ‘thought power’. This makes us think of getting into an aircraft and think about our destination and the plane takes us to the destination. We do not have any authentic proof to prove the existence of such technology. We can only guess the probable technology behind such thought powered aircraft. This is no longer a fantasy, in the next few years, this might be practically possible. Our scientists have started working towards it. They
have piloted a drone just using their thoughts. There are a few research papers and many news articles related to this research. A few of them are described below.

- Research Article titled “Quadcopter control in three-dimensional space using a noninvasive motor imagery-based brain-computer interface” written by Lafleur K and team is published in August 2013 issue of Journal of Neural Engineering. It describes an experiment to control a robotic quadcopter in 3-dimensional space using non-invasive scalp EEG in human. (LaFleur et al. 2013) Their approach was to train five people to modulate sensorimotor rhythms and control an AR drone which was navigating in a 3D space and providing the visual feedback through the front facing camera on the hull of the drone. They have proved that individual people were able to achieve 90.5% accuracy on all the valid targets while travelling at an average straight line speed of 0.69m/s. (LaFleur et al. 2013)

- Researchers from Technical University of Munich demonstrate that the brain controlled flight is possible. An article titled “Using thoughts to control airplanes” is available in a Research News section of the Technical University of Munich website dated 26th May 2014. A figure below represents a pilot wearing a helmet with many attached cables. This is the photograph taken during the test of thought controlled airplanes conducted at the “Institute of Flight System Dynamics” in Munich where scientists are researching ways in which brain controlled flight might work. As per the Aerospace Engineer Tim Fricke, their long term goal is to make flight accessible to more people, flying might become easier with the brain control and reduce the workload for pilots so that they are free to manage other tasks in the cockpit. (Zolfagharifard)
It is described that seven pilots with different levels of experience took up this flight simulation test and the accuracy with which they have successfully completed the test was enough to clear the flight license test. One of them could successfully follow eight out of 10 target headings with only 10 degrees deviation and many others were able to land under poor visibility. (Frickle 2014) (Zolfagharifard 2014)

### 2.2.3. Yuddha Kanda

We next find the description of the Pushpaka Vimana once again in Yuddha Kanda when Rama kills Ravana and further decides to return back to Ayodhya. Rama asks Vibhishana to check how they can quickly reach Ayodhya as travelling back on the same path would be very difficult. Then Vibhishana suggests that he can drop all of them to the city within a day.

एवमुक्तस्तु काकुल्ये प्रत्युवाच विभीषणः |
अहं त्वं प्राप्तिश्चामि ताम् पूर्तं पार्थिवात्मज || ६-१२१-८ (Valmiki, “Ramayana - Yuddha Kanda, Sarga 121”)

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If Pushpaka Vimana could take Rama, Lakshmana and others from Lanka to Ayodhya within a day then definitely it should be an aircraft. Driving distance between Lanka and Ayodhya is around 3427 kilometers and straight line distance is 2109 kilometers. Even if it travels at an average speed of 500 km/hour it should reach Ayodhya in around 4 hours. Even if the speed of that Vimana is 250 km/hour it can reach Ayodhya in 8 hours. Vibhishana then describes that, this wonderful airplane was made by Vishwakarma in heaven for Lord Brahma. Kubera had obtained it with great austerity from Brahma. Ravana had defeated Kubera and procured this plane by his power. Once Rama asks Vibhishana to invoke Pushpaka Vimana immediately, he invokes it. Rama and Lakshmana were amazed to see the aerial car Pushpaka, which resembled a mountain and could travel everywhere at will.

तत्पश्चादन्तं विमानं निर्मितं विघनम्

dhṛṣṭaḥ tadā vīsmayamāgam || 6.121.30 (Valmiki, “Ramayana - Yuddha Kanda, Sarga 121”)

The important concept from the point of view of this research is ‘Kaamagama Vimanam’ or ‘Thought powered aircraft’. As previously described, researchers from the University of Minnesota and Technical University of Munich have experimented and tested the simulation of flight of aircraft using Brain Computer Interface and have proved that it is practically possible.

Another important point which we should consider here is the number of passengers travelled to Ayodhya in Pushpaka Vimana. When Rama ascended the aerial car along with Seetha and Lakshmana; Vibhishana, Sugreeva and all other Vanara chiefs wished to travel to Ayodhya along with Rama. Rama happily asked them to join him in his aerial car. Seetha wished that Taara and other wives of Vaanara chiefs also would travel to Ayodhya with them and all of them ascended the aerial car along with bears and daemons, sat comfortably and reached Ayodhya in that aerial car. If Pushpaka Vimana could accommodate these many people we will have to think about the seating capacity of Pushpaka Vimana. This can be compared with the biggest passenger airplane in the world. Airbus A380-800 is one of the biggest passenger aeroplane in the world and has a massive seating capacity of 853 passengers and accommodates.
525 passengers in three class configuration (Daddu 2013) When we think about this, questions which come to our mind are:

- Did Ravana carry such a huge Pushpaka Vimana to abduct Seetha?
- Or Does Pushpaka Vimana have the feature of increasing and decreasing its size depending on number of passengers?
- Or Did Ravana have multiple aircraft and the aircraft which Ravana used to abduct Seetha is different from Pushpaka Vimana?

Definitely Ravana might not have taken a huge aircraft to abduct Seetha. Pushpaka Vimana might have had a feature to expand and contract its size depending on the number of passengers. Vymanika Shastra describes two features called “Sankocha” and “Vistrita”.

It is described that Ravana had six airports and multiple aircraft for his personal use at Lanka. The airports are “Weragantota” in “Mahiyangana”, “Thotupola Kanda” at “Hoton Plains”, “Usangoda” on “the southern coast”, “Wariyapola” in “Kurunegala”, “Wariyapola” in “Mattale” and “Gurulupotha” in “Mahiyangana” (Srinivasan 2012). In Srilanka, Pushpaka Vimana in which Ravana brought Seetha to Lanka is known as “Dandu Monara Yanthranaya” which means “Large peacock machine” in Sinhala. The first place where Seetha was brought in Lanka is known as Weragantota, it means “the place of aircraft landing” in Sinhala. It is described that Ravana had an aircraft repair center at Gurulupota which means ‘parts of birds’ (Knapp). Like this we can find the historical/mythological evidence of Ravana’s empire in Sri Lanka.

2.3. Saubha Vimana described in Srimadbhaagavatam

One of the very fascinating Vimana described in Srimadbhaagavatam is Saubha vimana. It is a very huge flying palace. Krishna’s wedding with Rukmini in a Swayamvara creates jealousy among a few of the young prince who had participated in swayamvara. One such prince is Salva. The jealousy makes him mad and hence Salva decides to wage a war against Vrishnis and destroy the entire Yadhava clan.

Salva performs a very deep penance to impress lord Shiva and receives Saubha Vimana as a boon. Saubha vimana is designed and built by Mayasura, the architect of that era. Because of its size it is considered as a huge Metallic flying palace. The speciality of Saubha Vimana is it could travel wherever Salva wished and its sight itself would create terror in the minds of Devas, Danavas, Gandharvas and the entire reptile family.
The war between Vrishnis and Salva is described in detail in Volume 10 and Chapter 76 of Srimadbhaagavatam. Saubha vimana is described as follows.

\[ \text{स लक्ष्मा कामगं यांतं तमोधाम दूरासदम्} \\
\text{ययौ द्वारकतिः शाल्वे वैरं वृषिकृतं स्मरन् \text{॥} ॥ ॥} (॥ श्रीमद्भागवतम् -श्रीमद्भागवतम् दशमस्तंभः: \\
उत्तरार्थम् ॥ 2017:114) ("Srimadbhaagavatam - Vol 10.4")

This means, “King Salva acquired this vimana which could travel anywhere at will and covered by darkness. He remembered his enmity with Vrishnis and travelled to Dwaaraka”. The special feature described in Vimanas during the era of Ramayana and Mahabharata is “Kaamagam Yaanam” i.e. “vimana which could travel anywhere as per the will”, in Ramayana we find the description of Pushpaka vimana which states “तत्त्वपकम् कामगं विमान” (Valmiki, “Ramayana - Yuddha Kanda, Sarga 121”) this shows that both in Tretha Yuga and Dwapara Yuga there existed vimanas which could fly based on the thought power. Our article titled “Probable technologies behind the vimanas described in Ramayana” describes this feature of “Kaamagamam yaanam” by comparing it with the concept of “Thought Powered Aircraft”. (Shruthi.K.R. and Rajani Jairam, “Probable Technologies behind the Vimanas Described in Ramayana”)

\[ \text{स गोपुराणि द्वाराणि प्रासादात्त्वातलतोलिका:} \\
\text{विहारान् स विमानाग्राह्यानिपतात: शस्त्रवृष्टः \text{॥} ॥ ॥} \\
\text{शिला द्रम्मश्राशयः सर्प्य आसार्षार्थकरः:} \\
\text{प्रवण्डःस्कवातोस्थूलवज्जसःच्छादिता दिश: \text{॥} ॥ (॥ श्रीमद्भागवतम् -श्रीमद्भागवतम् \\
दशमस्तंभः: उत्तरार्थम् ॥ 2017:114) (Srimadbhaagavatam - Vol 10.4)

King Salva’s attack on Dwaaraka is described in the above sloka. It is described that huge stones, logs of wood, vajraayudhas, snakes and the hailstones were dropped with the help of this Vimana and this created a violent storm which fogged all the directions by dusty air.
As described in our article titled “Analysis of a Few Interesting Vimanas Described in Srimadbhaagavatam, Mahabharata, Vedas, Arthashastra and Vymanika Shastra” destruction caused by Saubha Vimana reminds us of Bomber aircraft. (Shruthi.K.R. and Rajani Jairam 2016a) “B-2 Spirit Stealth Bomber” is a very good bomber aircraft. The website airforce-technology.com describes the features of this aircraft as follows.

“The B-2 has the capacity to carry up to 40,000lb of weapons, including conventional and nuclear weapons, precision-guided munitions, gravity bombs and a range of maritime weapons. Each weapons bay is equipped with a rotary launcher and two bomb-rack assemblies…… The B-2 can also carry the AGM-129 advanced cruise missile, which is a strategic cruise missile with a range estimated at up to 1,500 miles…… A generic weapons interface system (GWIS) has been fitted as part of the block 30 upgrade. The GWIS is an integrated digital software package, which allows the B-2 to carry different mixes of stand-off weapons and direct attack munitions on a single sortie, enabling the aircraft to attack up to four different types of targets on a single mission…..Under a contract awarded to Northrop Grumman in February 2008, the USAF has begun a programme to give the B-2 the capability to attack moving targets, using precision-
guided weapons such as the small diameter bomb II.” (“B-2 Spirit Stealth Bomber - Airforce Technology”)

The destruction caused by Saubha Vimana is comparable with the destruction caused by B-2 stealth bomber aircraft.

Figure 2-6: B-2 Spirit Stealth Bomber Aircraft

Here this is chosen for comparison mainly because it is one of the world’s best bomber aircraft. But in general, Saubha Vimana can be compared with any of the best bomber aircraft like Tupolev Tu-160 / Blackjack, B-1B Lancer, B-52 Stratofortress, Tupolev Tu-22M, Tupolev Tu-95 (Bear), Xian H-6, Sukhoi Su-24M (Fencer-D), Sukhoi Su-34 etc. We find the interesting description of War using Saubha vimana further as follows:

बहुरूपकृत तद्दृश्यते न च दृश्यते।
मायामयं मयकृतं दुर्विभावं परिभूतं॥२१॥
कचिदृभूमी कचिद्वापि गिरिमूप्ति जले कचित।
अलातचक्रवद्भाम् यतिभं तद्दृश्यस्थितं॥२२॥

(॥ श्रीमद्भागवतम् - श्रीमद्भागवतम् दशमस्कन्धः: उत्तरार्थम् ॥2017: 115) (“Srimadbhaagavatam - Vol 10.4, 10.76.22:175-177”)

Here the author describes the speed of the Vimana. Vimana was once visible in multiple forms and in the next second in single form, sometimes visible and suddenly invisible, once on the earth and suddenly in the sky, then in the mountains and suddenly on the water like a fire ball

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which never stays at a place confusing all the Vrishnis. This description speaks about the speed of the Vimana and how it was confusing all the Vrishnis. If the enemy aircraft is powerful as this, we can imagine how Vrishnis would have fought against them and destroyed Saubha Vimana. The interesting features like special navigation system for seeing during the night, invisibility and Stealth capability, splitting up airplanes into multiple airplanes and object detection system which can avoid collision while travelling at high speeds shows the technical capability of Saubha Vimana. We do not know whether the story described in Srimadbhaagavatam is real or imaginary. In both the cases we should appreciate the author for this wonderful description.

2.4. Flying palaces and aerial chariots described by Veda Vyasa in Mahabharata

Similar to Ramayana and Srimadbhaagavatam we find the description of Vimanas in a few parvas of Mahabharata. Indralokaagamana Parva in Vana Parva describes Indra’s aerial chariot as follows.

“"Aerial chariot driven by Mataali was moving in the air by dispelling the darkness by its radiance and scattering the clouds. The sound of its wheels was covering the entire sky like the sounds of lightning and thunder. That aerial chariot had shining swords, divine astras, powerful missiles, fearsome snakes with wide burning mouths and a heap of white stones similar to the white clouds. The chariot was tied with ten thousand golden coloured horses which were capable of travelling beyond the speed of air. It was not possible to measure the speed of this miraculous chariot with naked eyes.”

(“SrimanMahabharata - Vol 4 2014”)

\[\text{Sriman Mahabharata - Vol 4 2014}\]
It is described that Indra’s aerial chariot was capable of holding the weapons. This makes us think if it could be used as a bomber aircraft. We even have the description of Arjuna seeing thousands of vimanas on the way to heaven, and in Amravati an airport terminal which had thousands of vimanas parked in it and hundreds of vimanas travelling in all the directions. To accommodate these many aircraft the airport must be many times larger than the world’s largest and biggest “King Fahd International Airport” at Saudi Arabia (“Project Data, King Fahad International Airport - KFIA, Dammam - Saudi Arabia”). Amravati is not a place on the earth. So Indra’s aerial must be a huge spaceship which can be used for travelling from one planet to another. This means an easy mode of transportation was available to travel from one planet to another. The next interesting fact is the description of the aerial city called “Hiranyapura”. A daitya’s daughter Pulama performed severe austerities for thousand celestial years and received Hiranyapura as a boon from Lord Brahma. It is described that the city could not be attacked by any powerful beings except humans. Lord Indra gifted Arjuna a special celestial weapon by which he could defeat armies of Hiranyapura. Arjuna used his powerful astra and broke that powerful aircraft into tiny pieces.

Arjuna’s attack on Hiranyapura is comparable with Krishna’s attack on Saubha vimana. If Saubha Vimana is a flying palace Hiranyapura is a flying city. Both of them being very powerful and gigantic couldn’t sustain the astras used by Arjuna, Krishna and Yadavas and were totally destroyed. This shows the power of the astras/missiles used by Arjuna, Krishna and all the Vrishnis. Whether Mahabharata is real or imaginary, we have to appreciate the author for his wonderful creation. The concepts described thousands of years ago are something beyond whatever we have with all the advancements in our current technology.

2.5. Aircraft described in the Vedas

The Vedas are the oldest scriptures of Hinduism and Hindus consider the Vedas as impersonal and authorless. But as per our ancient epic Mahabharata, Vedas are Brahma’s creation. Oral tradition was the only means of transmission of vedas during that era. We find description of Vimanas in different types of vedas like Yajurveda, Rig Veda etc. We even find the description of Vimanas or aerial chariots described in Vaidhika Suktas related to the Sun, Indra and other vedic gods. Some vedic gods like Pushan have the flying chariot being pulled by animals like goats. (“Pusan | The Rig Veda Civilization” 2012)We have "Gaja vimana" which
has the more powerful engines. The type of animal used as a part of the chariot represents the power of the engine. The word “Agnihotra vimana” means with two engines. They flew within earth’s atmosphere and were able to travel in space and move submerged under water. Vimanas are described as being used widely in warfare. Current belief among those researchers who acknowledge that the vedas might be describing real events is that, this aerial warfare might have been between hostile extra-terrestrial races. There are sections of Yajurveda which describe Vimanas or flying machines. Section 10.19 of Yajurveda has a sukta which asks the engineer to construct sea boats which propel on water and airplanes which flies in the mid region after the clouds like boats which move on the sea and then fly high above and below the watery clouds.

Section 6.21 of Yajur Veda asks the student in science to sail in the ocean in steamers, fly in air in airplanes, understand the vedas to know the creator, control the breath through yoga, study astronomy to know the functions of day and night and study all the four vedas with their constituent parts.

Rigveda describes chariots of various Vedic gods like Indra, Agni, Asvins, Pusan, Marut, etc. By this we can understand the different modes of transportation, which existed during ancient era. A few of them are described below and conceptually compared with modern aircraft.

- **Pusan’s aerial chariot** — Jalayan - travels both on the ocean and in the air.
  
  यास्तेपूषानांसृवत्तः संमुखोपिशिष्यहृषःपुरुषभिः पाराक्ष्यंचतनिः ।
  
  तानिषासिद्वाः सूर्यस्यविश्वामे नृत्तश्वं दुश्चमीनः ॥ ६.०५८.०३ ॥
  
  ..Rigveda Mandala 6.58.3:10 (Griffith 1896:247)

Pusban is a vedic solar deity who is described after Indra and Agni in the sixth mandala of Rigveda. He is described as the most skilled and best of all the charioteers who even guide Surya. Third shloka in the 58th hymn of Rigveda sixth mandala describes that his chariot could travel both across the ocean and in the air. We can conceptually compare this aerial chariot with any of our modern amphibious aircraft which operates both in air and water. Our Modern amphibious aircraft can take off and land on both ground and water. Some of these amphibious aircraft are also called sea planes and have retractable wheels.

A Canadair CL-215T is one among many of the examples of amphibious aircraft. This was the amphibious aircraft which was used for firefighting role manufactured by a company called Canadair and had its first flight in the year 1967.
Figure 2-7: Canadair CL-215 (Scooper)\textsuperscript{11}

- **Agni’s aerial chariot - Tritala and Vidyut Ratha** - Three storied vehicle, vehicle which operates on power. There are many research articles and books which quote that, ‘Tritala’ a vehicle consisting of three stories is described in first sukta, hymn fourteen of mandala three in Rigveda.\textsuperscript{12} \textsuperscript{13} \textsuperscript{14} But when we referred back to the original text and even English translation we could not interpret how it describes three storied vehicles. Below is the sukta. All the research articles and books quote the same sukta for Vidyut ratha. Since the term ‘Vidyut ratha’ is present in the sukta we can correlate to it.

\begin{verbatim}
आ होतां मुन्द्रोविद्यवाच्यस्तात्सत्योपयजनः कृष्णितमः सूक्ष्मः ॥
विद्यवाच्यसहस्त्राण्युपस्त्रोऽभिनः शोभितके श्रुती वाण अभ्रेत् ॥ ३०१४.०१ (॥ ऋग्भेदः मण्डलं
副院长. Rigveda Mandala 3) (Griffith 1896:132)
\end{verbatim}

This is a sukta which describes Agni and his chariot. R Griffith in his English translation compares Agni’s car with lightning. We can also interpret this as an electric chariot or power driven vehicle. We tried to find out if we can figure out the description of ‘three storied vehicle’ in any other mandala and sections of Rigveda. But we could trace it. Detailed research is required to study if three storied vehicles are described in Rigveda. Three storied vehicle/aircraft

\textsuperscript{12} Motwani, Jagat. "Ancient Hindu Astronauts: Forgotten Superior Civilization." Bharatiya Manyaprad: 84.
\textsuperscript{13} Shivanandam, M. "Mercury Propulsion System in Vedic Vimanas and Modern Spacecrafts."
is not a reality even today, “Three Storeyed Sky Whale” which can carry 755 passengers is considered as the future of air travel even today. This concept vehicle is expected to have the wing span of 88 m, virtual reality windows and self-healing wings. If we can trace ‘tritala’ vimana in Rigveda it definitely shows the forward thinking of our ancient scholars of the Vedic era.

Figure 2-8: Three Storey Sky Whale

The term ‘Vidyut’ in ‘Vidyut ratha’ is compared with ‘lightening’. The word ‘Vidyut’ has one of the meanings as ‘electricity’; if we consider this meaning we can compare ‘Vidyut Ratha’ with any of our electric vehicles which are present in the market today.

- **Rbhus three wheeled aerial chariot - Trichakra Ratha**

Some portions of Rigveda's descriptions are available below:

> अन्तःश्रोज्जातोअंतभीशुरुक्ष्योति रथस्त्रिचक्रः परिवर्तते रजः ।
> मुहर्द्वन्द्रेव्यंस्थ प्रवाचंध्यामुभवः पृथिवीं यथचपुष्यां ॥ ४.०३६.०१ ॥ (॥ ऋग्वेदः मण्डल ४ ॥)

Rigveda Mandala 4 2017:32

“This car that was not made for horses or for reins, three-wheeled, worthy of lauds, rolls round the firmament. That is the great announcement of your Deity, that, O ye Rbhus, ye sustain the earth and heaven.” (Griffith 1896:173)

Three wheeled chariot is described multiple times in various mandalas of Rig Veda. In Mandala 1, we find the description of Rbhus, Vishvedevas and Asvins three wheeled aerial

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chariot multiple times. Here in Mandala 4, we find the description of Rbhus three wheeled aerial chariot which can sustain the earth and heaven. Even today we can find aircraft which have three wheels in the landing gear. Two main wheels and the third positioned either at the front or at the rear of the airplane. This can be compared with Trichakra Ratha described multiple times in Rigveda. One of the examples of such an aircraft which has three wheeled landing gear is Mooney M20J. It is a personal use civil aircraft produced by the Mooney Airline Company and it has many variations in the past 60 years.

![Figure 2-9: Mooney M20J](image)

- **Vayu’s aerial chariot** – a chariot powered by wind. (Rigveda 5.41.6)

  Similar to ‘Tritala’ there are many research articles and books which mention about the description of ‘Vayu ratha’ or ‘wind powered chariot’ in sixth sukta of fifth mandala, forty second hymn of Rigveda. When we refer back to the original text we understand that

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19 SAGAR KAMATH. CHRONUX; BECOMESHAKESPEARE COM. Print.
forty first hymn in fifth mandala of Rigveda has suktas related to Visvedevas. These suktas describe various solar deities like Mitra-Varuna, Aryaman, Ayu, Indra, Rubukshan, Vayu and many more. The solar deity Vayu is the personification of wind power. His chariot is described as ‘Vayu Ratha’ or ‘wind powered chariot’.

Rigveda Mandala 5 2017:26

“Bring hither him who yokes the car, your Vayu, who praises with his songs, the God and Singer;
And, praying and devout, noble and prudent, may the Gods’ Spouses in their thoughts retain us.”(Griffith 1896:198)

The above sukta does not describe the wind powered aircraft, but just mentions about Vayu’s chariot or ‘Vayu Ratha’. Even though the concept of Vaayu ratha is mentioned during vedic era, wind powered planes are still being researched. But we have incredible wind powered gliders.

- **Soma Pavamana’s aerial chariot** - operates on the ground and in water.

Rigveda Mandala 9 2017:10

“REPOSING on the river's wave the Sage hath widely flowed around, Bearing the hymn which many love.” (Griffith 1896:373)

Fourteenth hymn in the ninth mandala of Rigveda describes sukta related to Soma Pavamana. This sukta conceptually describes a vehicle through which the sage travelled around the land and the river. This reminds us of amphibious ‘Aquaduck’ which we have seen in Gold Coast, Australia, which travels both on land and in water.
Kaara can also be conceptually compared with our modern amphibious vehicles which are capable of fighting with the enemies both on land and water. Best examples for this mode of transportation are Amphibious Military Vehicles whose inherent nature is to traverse on both land and water and provide tactile value to the system as shown in the figure below.

2.6. Aircraft and Flying Machines described in Vymanika Shastra

The only available Sanskrit book which is completely dedicated to vimanas is Maharshi Bharadwaja’s Vymanika Shastra. The book is written by Maharshi Bharadwaja.
himself is under debate. This book was propounded by Sri Anekal Subbaraya Shastri in the early 1900s. This is a very interesting book which describes the definition of pilot, food and clothing to be used by pilots and 32 secrets/features of aircraft on which the pilots should be trained on. Further, this book speaks about the aerial routes, components of vimana, metals suitable for airplanes and the procedure for purifying those metals. This book has an entire chapter dedicated to mirrors and lenses used in aircraft, power sources, yantras or machinery, classification of vimanas based on yugas and finally the four types of Kritaka Vimanas.

Even if we are not ready to believe that Vymanika Shastra is written by Maharshi Bharadwaja and consider it as just an early 1900’s book, the contents of this book are highly appreciable. This book has many interesting features required for military aircraft like

- **Goodha**- a technique to hide the aircraft from enemy,
- **Drishya**- technique to produce camouflaged vimana,
- **Adrishya**- a technique to produce a white cover around the vimana to make it invisible,
- **Sankocha** – a technique to contract the aircraft wings high speed flight,
- **Stabhdaka** – a technique to make people in enemy plane unconscious by discharging apasmaara poison fumes and
- **Karshana** – a technique to set fire to opponent aircrafts trying to attack in multiple numbers.

These are the advanced techniques which are expected in our modern aircraft, but it is surprising to know that our ancient scholars had thought about it long ago. Our modern aircraft no longer uses metals and alloys, now we are in the era of composites. But it is interesting to know that our ancient scholars had mainly used three metals and had obtained 16 different alloys which can be used in the manufacture of aircrafts. Our modern aircraft doesn’t use mirrors and lenses extensively as described in Vymanika Shastra, but our ancient scholars had figured out an approach through which they could use mirrors and lenses as the reflectors, deflectors, absorbers, radiators and augmenters of light and energy beams. (wg. Cdr. M.P.Rao, *Chapter 15: MIRRORS-DARPANADHIKARANAM*) Technology might be different, but the concept remains the same. Same is the case with the seven power sources such as Tundila, Panjara, Shaktipa, Apakarshaka, Sandhaanika, Daarpanika and Shakti prasavika. Similarly, we find description of yantras such as Shaktyakarshana yantra, Angopasamhara yantra, Guhagarbha yantra, Tamogarbha yantra, Shabdhakarshana yantra and many more. In the year 1973, H.S.Mukunda and team from IISc
have conducted a detailed study of “Vymanika Shastra” and published a detailed report titled “A Critical Study of the work Vymanika Shastra” in the year 1974. There are very interesting facts which has come out of this report. The book Vymanika Shastra says that it is written by Maharshi Bharadwaja, but as per H.S. Mukunda and team, this book cannot be dated earlier than 1904. Below is their observations.

“(a) The kind of Sanskrit used in the text may indicate whether or not the text is of Vedic origin…..BVS mentions that a few words did have a structure similar to that of the Vedic Sanskrit. The number of such words being very small, and their usage being incidental, it appears appropriate to conclude that the Sanskrit used in the text is modern.

(b) Another significant point is the almost complete absence of any mention of use of aircraft in the innumerable Sanskrit texts of the post-Vedic age. One text, namely “Samarangana Sutradhara”, by Bhoja deals with some description of aircraft, but does not quote any earlier work. ……The most important of texts like Ramayana and Mahabharata make no mention of the use of aircraft for travel, military, or war purposes. The ‘Pushpaka Vimana’ of Ramayana, as described therein, has no flying qualities except possibly by invocation of ‘mantras’ or ‘tantras’. Of course, a discussion of whether these existed at all is undecideable within the realm of science and is beyond the scope of this paper. Thus it appears to us from internal and related evidence that the work VS is of recent origin.” (Mukunda et al. 1974:7)

G R Josyer’s English translation of “Vymanika Shastra” (VS) is also criticized as least scholarly compared to the Hindi version of the same published in the year 1959 called “Brihad Vymanika Shastra” (BVS). (Mukunda et al. 1974:7)

2.7. Aircraft described by Paramara ruler Bhojadeva in Samarangana Sutradhara

Bhojadeva’s Samarangana Sutradhara is one of the ancient treatises in Sanskrit literature which has substantial information about yantras. Chapter 31 of this book ‘Yantravidhanam’ describes various mechanical contrivances of that era. This book is one of the few Sanskrit texts which speak about the actual construction of vimanas. (Sharma 2012:363 - 404)

In this book Bhojadeva describes two types of Daaru Vimanas and its applications. They are:

- **Laghu Daaru Vimana**


लुढ़दारुमयं महाविहंस्ङ्ग रटसुस्थिष्टता नु विधाय तस्य।
As per Bhojadeva, the body of vimana is mainly made of lightwood i.e. ‘Laghū Daaru’, the vimana is a huge bird shaped i.e. ‘maha vihanga’ with a wing on each of the sides. He explains that, the internal structure has a fire chamber with mercury placed over flame which acts as a motive force. The power generated by the heated mercury, helped by the concurrent action of the wings, which are flapped by a rider inside, makes the yantra go up and travel far. (V. Raghavan 1952:23-24) (Rajani Jairam and Shruthi.K.R. 2015:18)

- **Alaghu Daaru Vimana**

Alaghu Daaru vimana is a heavier Daaru vimana. The below verses describes an Alaghu Daaru vimana and its constructional details.

इल्मीज सुरमन्दिरूत्त्वः सभितलयलु गारुविमन्।
आदीरीत विधिना चारोऽन्तरस्तु पारद्रव्याति द्रुदकुम्भानां। १७॥
अयः कपालाहितमन्दवहि प्रतापत्तकुम्भभुवा गुणेन।
व्योमां झगिताभरनलमेणि संतप्पर्कर्ज्ञरसराजशक्यः। १८॥(Sharma 2012:381-82)

While Laghu Daaru vimana is in the shape of a bird, Alaghu Daaru vimana is in the shape of a temple. It is described that Alaghu Daaru vimana flies along with a heavy aerial car made of wood. It contains four pitchers of mercury placed over iron ovens. (Rajani Jairam and Shruthi.K.R. 2015 : 18) When mercury is heated, it explodes quickly and becomes an object of decoration in the sky.

Our research article titled “Mechanical Contrivances and Daaru Vimanas described in "Samarangana Sutradhara" of Bhojadeva” describes in detail about the Daaru Vimanas described by Bhojadeva. The interesting fact which we have to focus on is the use of ‘suta’ or ‘mercury’ as one of the constituent elements and ‘vijayat’ or ‘ether’ as the medium of action. While Laghu Daaru Vimana flies like a bird in the air, Alaghu Daaru Vimana requires a launcher to fly high in the air. Mercury engines used in Daaru vimana can be compared with mercury vortex engines used in SERT1 launched by NASA in the year 1964. (Rajani and Shruthi K R 2015:16-20)

Indologist ‘William Clendenon’ in his English translation of the work Samarangana Suthradhara describes Mercury Vortex engine s follows.
“Inside the circular air frame, place the mercury engine with its electric/ultrasonic mercury boiler at the bottom center. By means of the power latent in the mercury which sets the driving whirlwind in motion a man sitting inside may travel a great distance in the sky in a most marvelous manner. Four strong mercury containers must be built into the interior structure. When these have been heated by controlled fire from iron containers, the vimana develops thunder-power through the mercury. And at once it becomes like a pearl in the sky.” (Childress 1991, Vimana Aircraft of Ancient India and Atlantis :254)

Bhojadeva mentions that the terrific noise produced by boiling mercury ovens can scare away the elephants and hence can be used in battles for this purpose. The elephants can be thrown completely out of control by strengthening the mercury chambers and increasing the roar. According to Mr. V. Raghavan because of this specific military use of aircraft we can compare Hasti-yantra described by Kautilya (to fight against the army which has elephants) with the Alaghu Daaru-vimana described by Bhojadeva. (V. Raghavan 1952)

2.8. Conclusion and introduction to next chapter

We have analyzed the description of vimanas in our classical texts written by our ancient scholars. They all had the clear picture of aerial chariots in their minds. Commonalities which we have found in many of these Vimanas are as follows.

- All these Vimanas were huge.
- They were capable of being driven by ‘thought power’.
- Many were used during wars and had the capabilities of holding astra/weapons.
- Some were spaceships which were capable of travelling from one planet to another.

Some of the other findings are:

- Different modes of transportation and types of amphibious aerial chariots are described in the vedas.
- Vymanika Shastra has described very interesting features of vimanas which are very useful for war aircraft even today.
- Daaru Vimanas described in Samarangana Sutradhara of Bhoja deva used mercury engines.

In this chapter we have studied the Vimanas described in our classical texts like Ramayana, Srimadbhaagavatam, Mahabharata, Vedas, Vymanika Shastra and Samarangana
Sutradhara of Bhojadeva in detail, the interesting features like ‘Thought powered aircraft’, ‘Stealth features, ‘Bomber aircraft’, ‘Amphibious aircraft’, ‘flying palaces’ and different modes of transportation described in vedas. In the next chapter, let’s analyze Vymanika Shastra, the only available Sanskrit book which is entirely dedicated to ancient Vimanas. We shall mainly concentrate on secret features of aircraft, parts of aircraft, metals used in the construction of aircraft, different types of fireplaces and crucibles used for melting metals, mirrors and lenses used in aircraft, power sources, aerial routes and various yantras described in Vymanika Shastra. Let’s try to understand the thought process of our ancient scholars and see how their thinking is relevant to present times.