



AST-6

Concept of Vimāna in Ṛgvēda and Vaimānikaprakaraṇa of Bharadvāja

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ABSTRACT

Ṛgvēda speaks of the aircraft in no uncertain terms in hundreds of Ṛks spread over ten maṇḍalās. In all these cases it uses terms like nāva, rathā, which imply a vehicle. Especially, this term is used in conjunction with the vehicles used by the Dēvatās, the Gods, who used to frequently fly to reach the destination requested by the yajamāna.

However, the details of these vehicles accurately correspond to the explanation of an aircraft. Several details of running the aircraft for the speedy and safe transportation of Royals, transportation managed by merchant class (vaiśya), instructions for those who want to build an aircraft and derive its benefits, the aircrafts which can fly in all the three dimensions - land, water and sky, have all been mentioned in Ṛgvēda.

Probably as a contemporary development, Ṛṣi Bharadvāja, a Ṛgvēdic Ṛṣi, has in a separate chapter on aircraft, technically used the word vimāna. The 'Vimānaprakaraṇa' of the main text 'Yantrasarvasva' (which the scholars say contained forty chapters, which is not available to scholars till date) is a welcome addition to the knowledge our forefathers had on the aircraft. The author explains the concept of aircraft in 500 sūtrās. And these are divided into eight main chapters. In each there are, on an average, eight sub-chapters. The commentary has been written by one Bhōdānanda of eighth century B.C. This commentator recalls many other aviation scholars like Nārāyaṇa, Viśvambhara, Lalla, Śaṅkha and quotes them profusely.

♦ The author explains the aircraft in the following contextual divisions:

- (a) The 32 secrets to be known by the operator of the aircraft; (b) The fuel that has to be used in running the aircraft; (c) The materials to be used in the construction of the aircraft and their manufacturing techniques; (d) The pilot's cabin and the description of the controls and switches; (e) Manufacturing techniques of the machine systems and mirrors, which are an important tool in creating illusions; (f) The different forces of wind (vātaśakti) for which the aircraft has to be engineered to; and (g) The clothing and food to be consumed during an air travel.

Based on these works (Vaimānikaprakaraṇa and Aṃśubōdhini of Bharadvāja) a project was undertaken by the National Materials Laboratory on the instruction of Indian National Science Academy in 1991 to verify the genuinness of the claim made in these works. Alloys like 'tamōgarbha lōha' were prepared in these laboratories and



tests were conducted. The results conclusively proved that the claims made were found to be true. Patents have been obtained, subsequently, by these laboratories.

The interesting feature in these references of Ṛgvēda and Vaimānikaprakaraṇa is that the reader gets a feeling that the authors of these works had an intimate knowledge of the aircraft, and had seen these aircrafts flying.

1.0 Introduction:

It is interesting to find records on Aircrafts in the earliest texts on earth. Ṛgvēda and Vaimānika Prakaraṇa are the two works which speak of an aircraft in no uncertain terms. This, indeed, is a matter of astonishment as we have been told time and again that Ṛgvēda was written when the human civilisation was just opening its eyes. It would be, therefore, a matter of importance to properly analyse this claim and arrive at the truth.

2.0 The Concept of Vimāna in Ṛgvēda:

Ṛgvēda speaks of Vimāna as a concept. It does not, however, use the word Vimāna to identify an aircraft. The words used by Ṛgvēda to indicate an aircraft are the general terms it has used to identify a vehicle like Rathah (chariot), Nāvah (vessel), Yōjanaḥ (vehicle).

The credit of identifying Vimāna in the Ṛks of Ṛgvēda goes to Svāmī Dayānanda Sarasvatī, who wrote a classical work Ṛgvēdādi Caturvēda Bhāṣya Bhūmikā in 1876 A.D. He identifies around Eleven Ṛks, where the description of ship building, concept of an aircraft and movement of Dēvatās on an aircraft in the sky around the earth are found.

The explanations provided in Ṛgvēda amply demonstrate that the referred vehicles are the aircrafts especially used by Dēvatās. There are literally thousands of Ṛks, which identify the chariot in which the Dēvatās travel like flying in the space (Antarīkṣe Caranti - Ṛ.6.58.3). They describe the motion of the aircraft in a similar way as a chariot moves on the land. All the features of a chariot like horses, wheels and reins are indicated on these aircrafts to varying degrees. Ṛbhus are supposed to have created a chariot for Aśvinī Dēvatās, which had three wheels (Tricakraḥ), which could move in all the directions in the space (Rajah Parivartatē) and which had no horses (Anaśvaḥ) and no reins (Anabhīṣuḥ). (Ṛ.4.36.1). This is precisely a similar explanation of that of a present day aircraft, where the aircrafts move on three legs before take-off. It is also said that Ṛbhus proved their metal of being Dēvatās by this act of construction of the aircraft.

2.1 The duties of Dēvatās in an aircraft:

It is interesting to note the duties performed by Dēvatās while flying in a Vimāna. The most important duty referred to is that of protection to the ruling King and his subjects, who were devoted to the Dēvata in question. This duty is of paramount importance, and runs throughout the text of Ṛgvēda. One can count thousands of Ṛks identifying this aspect of protection provided by a



Dēvata.

Certain Dēvatās had specific duties apart from the protection they provided to the King and his subjects. Maruts were identified as Dēvatās, who brought rain. They were entrusted with the duty of sending rain (Vṛṣavātāsaḥ) with the help of chemicals (?), which could create droplets of rain (Pṛṣatīḥ) while riding on their chariots (Rathēṣu). This explanation seems to be similar to the cloud seeding technique practised today to bring rain. (R.1.85.4)

The above Ṛk on Marut Dēvatās also refers to another duty - that of moving mountains with their power (Acyutā Cit Ōjasā Pracyāvayantaḥ). To understand exactly what this means, we have to refer to another Ṛk in R̥gvēda, where similar duty is mentioned. The Aśvinīdēvatās referred to in R.6.62.7 'did penetrate the mountain by their triumphant chariot' (Rathyā Jayuṣā Adriṃ Viyātaṃ). These references indicate that tunnels were created by penetrating (drilling) the mountains for the purpose of building paths or allowing the river/rain water to pass through to the other side of the mountain. For an average observer, these looked like moving of mountains. The Dēvatās performed these duties with the help of their chariots (aircrafts). It would be, therefore, logical to presume that their aircrafts were provided with equipment that could drill and penetrate the mountains.

2.2 Features of the Vimāna:

R̥gvēda does not provide us with the exhaustive description on the features of a Vimāna like Vaimānika Prakaraṇa does. However, certain features are flashed in the course of the description.

The Vimāna of Pūṣan Dēvatā is of the colour of Gold (Hiraṇmayīḥ Yāḥ Nāvaḥ). The Vimāna of Aśvinī Dēvatās is endowed with appropriate and powerful engines (horses? Suyujā) (R.1.117.5). The colour of the vehicle handed over to Pedu by Aśvinī Dēvatās was white (Śvētaṃ Aśvaṃ Dadathuḥ). And Pedu, who took hold of the aircraft from them (he also learnt the operation of the aircraft) was able to perform all the duties of the Dēvatās by using this chariot, by destroying the enemies and giving protection to the King and his subjects (Paidvaḥ Aryaḥ Vājī Sadmit Havyaḥ). (R.1.116.6)

2.3 A classical aircraft that saved Bhujya:

One of the celebrated instances of an aircraft that saved Bhujya is eulogised in a series of Ṛks and also elsewhere in R̥gvēda (R.1.116.3 to R.1.116.6). Tugra, a King, had sent his son Bhujya to an island in the depth of the ocean. Unfortunately, the island was submerging and the life of Bhujya was at threat.



Then Aśvinī Dēvatās (Nāsatyāḥ) saved Bhujya with the help of three aircrafts (Tribhiḥ Rathaiḥ) that had hundred feet (Śatapadbhiḥ) and six engines (Ṣaṣaśvaiḥ)(R.1.116.4). Since Sāyaṇācārya, who wrote commentary on Ṛgveda in the fifteenth Century, had no access to information on those types of vehicles that we have today, he interpreted Śatapadbhiḥ to mean hundred wheels. In fact, Ṛgveda very rightly uses the word 'Cakra', whenever it wants to indicate a wheel.

Now let us go further in understanding this vehicle. This vehicle runs on land where there is no water (Dhanvan), on ocean where there is plenty of water (Ārdrasya Samudrasya) and also on the sea coast (Pārē). Also, it looked like it had hundred oars (Śatāritrām). The aircraft was travelling in space above (the water and land) without any support (Anārambhaṇē), without any shelter (Anāsthānē) and without any hold (Agrabhaṇē)!!

The explanation clearly establishes a hovercraft like (which is presently used on sea) aircraft, which can comfortably travel both on land and sea. (R.1.116.5). Since Sāyaṇācārya had no access to this information, he assumed Śatapadbhiḥ to mean hundred wheels, whereas they were indeed PADS (Padbhiḥ). Bhujya, who travelled with Aśvinī Dēvatās, was indeed happy to travel in this aircraft without fear, even though there was a huge turbulence in the ocean (Arṇasaḥ Samudrāt) (R.1.117.14). The vehicle is further explained as not getting wet, although travelling in water (Amṭarikṣaprudbhiḥ Āpōdakābhiḥ)(R.1.116.3).

One can see by these explanations that the Ṛṣīs were explaining an aircraft that they had seen and experienced. Some of the features of the aircraft like the one that saved Bhujya, however, is yet to be realised technologically even today. (Appendix-A)

3.0 Vimāna as described in Vaimānika Prakaraṇa of Ṛṣi Bharadvāja

If the Vimāna of Ṛgveda is indicative, the Vimāna explained by Ṛṣi Bharadvāja is concrete and flooded with information. The 500 Sūtras of Ṛṣi Bharadvāja, and the three thousand and odd Ślōkas of Bhōdānanda commenting on these Sūtrās is a veritable gold mine of information as to the construction, operation and maintenance of an aircraft.

The 'Vaimānika Prakaraṇa' is said to be a chapter of a gigantic work 'Yantra Sarvasva', a classical work in Engineering. It is said that this work contained forty such chapters. It is unfortunate that the scholarly world is deprived of the full text of 'Yantra Sarvasva'.



The work by Ṛṣi Bharadvāja clearly establishes that the knowledge our forefathers had on aircraft technology was not a figment of their imagination. This work is further divided in to eight chapters. And these chapters are further divided into nearly one hundred sub-chapters. The five hundred Sūtras of Ṛṣi Bharadvāja have been expanded through an exhaustive commentary by Bōdhānanda, whose period has not been established but can be placed around eighth century.B.C.

Ṛṣi Bharadvāja, we should remember, was a versatile scholar of Ṛgvēdic period and Ṛgvēda contains many Ṛks in his name. He is also the father of Āyurvēda, which is considered as an Upavēda of Ṛgvēda. His knowledge of Āyurvēda gets reflected in the preparation of 'Vaimānika Prakaraṇa', where exhaustive references are made to Ōṣadhīs and chemicals that appear in Āyurvēdic texts. It is seen by his mastery over diversified fields of knowledge that it was a common practice to acquire mastery over many fields simultaneously. The title 'Śatakratu' (doer of hundred deeds) given to Indra is an indication of diversified knowledge-fields that Gods and Ṛṣīs of Ṛgvēda period mastered.

Bōdhānanda, who has provided an excellent commentary to the Bharadvāja Sūtras, recalls many scholars who have provided technical texts on Aeronautical Engineering preceding his period. The names of scholars like Nārāyaṇa Muni, Śaṅkha, Viśvambhara appear with their quotes. This strengthens the belief that there was a widely accepted school on Aeronautical Engineering.

3.1 Edited version of Svāmi Parivrājaka

The present work was made available to the scholarly world by the efforts of Svāmi Brahmamuni Parivrājaka of Gurukul Kāṅgaḍi, Haridwar. Svāmi Parivrājaka obtained the manuscript available at Barōḍā Saṁskṛta library in 1918 and obtained another copy in 1919 from Poona college. His edited and translated work in Hindi was first published in 1958 after an exhaustive study for 40 years by him, and the second edition was published in 1977. However, the copies of this work are not easily available.

Svāmi Parivrājaka has done a laudable translation. He has tried to identify the various Ōṣadhīs and chemicals that appear in Vaimānika Prakaraṇa based on his Āyurvēdic knowledge. However, the technical parts of the Aeronautical Engineering has been to a large extent left unexplained.

Some of the important chapters of this text contain information on the thirty-two secrets the 'Vyōmayānādhikāri' (pilot) should possess before flying.



the formation of thirty-three light alloys required to build an aircraft, the thirty-two sub-systems of the aircraft, the food to be consumed during the flight, the dangers in the sky in the form of various magnetic fields and gravitational attractions that are to be avoided during flying, and the manufacturing techniques of mirrors (Darpaṇa) that are to be used for creating illusions and viewing the sky. The titles of these ninety-nine chapters themselves indicate the vast area of subjects that the text covers.

3.2 A Primary text or a Compendium?

On an analysis we find that the text seems to be an introductory work for a student of Aeronautical Engineering. This impression is derived from the fact that the text refers very frequently to many scholars and their works in the course of the commentary as it is done today in modern day texts, where a student is encouraged to cross-refer for attaining superior knowledge. Literally, hundreds of works and authors are named. Some of the major works we come to know are Vimānacandra, Vyōmayānatāntra, Yantrakalpa, Yānabindu, Khēṭayāna Pradīpikā, Vyōmayānārkaprakāśa authored by Nārāyaṇa Muni, Śaunaka, Garga, Vācaspati, Cākrāyaṇi, Dhunḍinātha respectively.

These cross references and some detailed instructions in a few places (like manufacturing details on mirrors) make us arrive at the conclusion that there was a large technology course run by eminent scholars to teach students of Aeronautics and the Pilots who had to operate the aircraft. The same logic also makes us think the text to be a compendium of Aeronautical technology, which a student should read before he makes up his mind as to the areas of specialisation he intends to undertake.

3.3 What is Vimāna?

The first Sūtra of the text clarifies Vimāna as:

वेगसाम्याद् विमानोऽजानमिति ॥१॥

meaning as that which flies as a bird. Bōdhānanda subsequently quotes the statements of Lalla, Nārāyaṇa, Śaṅkha and Viśvambhara to elaborate on this concept of Vimāna. The concept starting from 'a vehicle that flies in comparison to a bird' gets elaborated to 'a vehicle that flies in the sky from one country to another country, one island to another island and one Lōka to another Lōka'. In the process, the Vimāna assumes various forms of a flying machine including that which can fly in all the three media - land, sky and water.

3.4 The Thirty-Two Secrets

The second Sūtra is of importance to those who are interested in understanding the concept of a Vimāna as it existed then:



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lines on the surface of the earth as containing metallic ores. Text also indicates the superior lines that are to be followed for extracting right grade metals.

The temperature scales of melting have been specified as 'Liṅka'. The scientists at the National Metallurgical Laboratory (NML), Jamshedpur have identified the equivalence of 'Liṅka' to the present day temperature scale as:

1 Kakṣya = 3.54 degree C

6 Kakṣya = 1 Liṅka = 21.24 degree C

101 Kakṣya = Boiling point of Mercury, which is 356 degree C

50 Liṅka = Melting point of Gold, which is 1062 degree C

Majority of chemicals and Ōṣadhīs used in formulating these alloys and the mirrors, have been identified to be those referred in the Āyurvēdic texts. However, there are still a few, which need to be appropriately identified. The NML scientists team which worked on Prakāśastambhanābhid Lōha (light absorbing/heat transmitting material) concluded that the information provided in manufacturing this material by Ṛṣi Bharadvāja is accurate and practical.

3.6 Mirrors :

The mirrors (Darpaṇa) are one of the peculiar features of this text. To divert the attention of the enemy in the other aircraft, extensive illusions are created with the help of these mirrors.

The mirrors named here are seven (Appendix B (2)). Each one has a specific job to perform. The twenty-two secrets, out of the thirty-two secrets employed to create illusions extensively depend on the employment of these mirrors. The text also gives details of the manufacturing techniques of these mirrors.

3.7 The Machine Systems:

The machine systems (Yantrādhikaraṇam) spoken about is the largest chapter in the Vaimānika Prakaraṇa. The text identifies 32 machine systems that are essential to run an aircraft and also creating those illusions like balls of fire for protecting oneself from the attack of the enemy aircrafts.

The three Sūtrās on machines are elaborately explained by Bōdhānanda, the commentator, in 1460 Ślōkās, which run into almost half of the explanations of the entire text. Each of the machine systems is elaborately described as to (a) its working, (b) its structural plan and (c) specific equipment and material that go into its manufacturing.

The systems are named by their intended work, like Viśvakriyā Darśana Yantra is expected to perform the wholesome operation of the aircraft, Tamōyantra is expected to create darkness and Śabdakēndramukha Yantra to



generate a huge sound that makes the enemy unconscious.

The list of machine systems starts from Viśvakriyā Daśana Yantra and end at Vaiśvānaranāla Yantra. The last machine system seems to be an all powerful tool and assists the pilots in achieving the thirty-second secret, namely Kaṛṣaṇa Rahasya, where balls of fire are repeatedly thrown on to the enemy aircraft at very high temperatures of 87 Liṅka (equivalent to app.1850 degree C) It is interesting to note that these machine systems are appropriately positioned and located inside the aircraft. If Viśvakriyā Daśana Yantra, Śaktyākaṛṣaṇa Yantra and Parivēṣa Kriyā Yantra are placed in the front of the aircraft to get an effective frontal perspective, Puṣpaṇī Yantra and Tamōyantra are placed in the rear portion of the aircraft to utilise its full potential.

The Kriyāgrahaṇa Yantra, equivalent to modern day arial photography, is done by spreading the photographic panel (Śuddhapāṭa) placed at the bottom of the aircraft. (Appendix B (3))

3.8 Types of Aircrafts:

The text proceeds to explain different types of aircrafts with great zeal. To give a historical perspective, it talks of certain aircrafts that could be created out of Yōgamantrānuṣṭhāna in the ages of Kṛta and Trētā yuga. The classical aircrafts get reduced in the Dvāpara yuga.

In Kaliyuga, the Kṛtakavimāna rules the sky. Twenty-five types of aircrafts are mentioned in the text. (Appendix B-(4)) These vary in forms - from a bird-like form (like the present day aircrafts) to three to four storey building. Some of the explanations fit into a helicopter. A flying machine, Tripuravimāna, which can fly on land, air and water, is also mentioned.

3.9 Other Aspects:

The text prods through various other knowledge requirements - food to be consumed and clothes to be worn during a flight, various texts to be referred to get a mastery over the technology (Appendix B -(5)) and the Ācāryās who have written these texts (Appendix B -(6)).

4.0 Conclusion:

The Ṛgvēda expounding the cause of aircraft and Vaimānika Prakaraṇa of Ṛṣi Bharadvāja are serious works that open us to a knowledge on Aeronautics that is both astonishing and informative. These works throw out the possibility of Aeronautical Technology beyond our present day knowledge and imagination. It would be highly appropriate for the technical community to convert this knowledge into reality.



Appendix A

Some of the Rks of Rgvēda mentioning a flying machine

(Translation as in the edited texts of ऋग्वेद संहिता, श्री जयचामराजेन्द्र वेदरत्नमाला, १९४९, Editor: H.P.Venkata Rao)

ऋषिः - मेधातिथिः काण्वः, देवता - ऋभवः

ऋ.१-२०-३

तक्षत्रासत्याभ्यां परिज्मानं सुखं रथं। तक्षन्धेनुम् सबर्दुधाम्॥

They constructed for the Nāsatyās, an easy moving chariot which is capable of moving everywhere and a cow that gives milk.

ऋषिः - अजीर्गतिः शुनःशेषः स कृत्रिमो वैश्वामित्रो देवरातः, देवता - वरुणः

ऋ.१-२५-७

वेदा यो वीनां पदमन्तरिक्षेण पततां। वेद नावः समुद्रियः॥

He who knows the path of the birds flying through the air, he who knows the course of the ship in the ocean; (may he loosen our bonds).

ऋषिः - हिरण्यस्तूप अंगीरसः, देवता - अश्विनौ

ऋ.१-३४-२

त्रयः पवयो मधुवाहने रथे सोमस्य वेनामनु विश्व इद्विदुः।

त्रयः स्कम्भासः स्कभितास आरभे त्रिनक्तं याथस्त्रिर्वश्विना दिवा॥

There are three wheels to your honey-bearing (food etc.) chariot as all the Gods have known it to be when attending the marriage of Vena, the beloved of Soma; O Āśvins, there are three posts fixed in the chariot for support. And in it thrice you drive by night and thrice by day.

ऋ.१-३४-१२

आनो अश्विना त्रिवृता रथेनावीचं रयिं वहतं सुवीरम्।

शृण्वन्ता वामवसे जो हवीमि वृधे च नौ भवतं वाजसातौ॥

Sitting in your chariot that traverses the three worlds, bring us plenty of wealth accompanied by valiant progeny; I call upon you both for protection, listen to me and give us victory (encouragement) in battle.

ऋषिः - प्रस्कण्वः काण्वः, देवता - अश्विनौ

ऋ.१-४६-७

आ नो नावा मतीनां यातं पाराय गंतवे।

युंजाथामश्विना रथम्॥

O Āśvins, come as a ship to bear us over the ocean of praises; harness your car.

ऋषिः - गोतमो राहूगणः, देवता - मरुतः

ऋ.१-८५-४

वि ये भ्राजन्ते सुमखास ऋष्टिभिः प्रच्यावयन्तो अच्युता चिदोजसा।

मनोजुवो यन्मरुतो रथेष्व्वा वृषव्रातासः पृषतीरयुध्वम्॥

They (Maruts) who are well worshipped, shine with various weapons; through



their mighty vehicles, they are shakers of even unshakable (mountains etc.). Maruts, entrusted with the duty of sending rain, yoke the spotted deers to their chariots.

ऋषिः - कक्षीवान् दैर्घतमस औशिजः, देवता - अश्विनौ

ऋ.१-११६-३

तुग्रो ह भुज्युमश्विनोदमेघे रयिं न कश्चिन्ममृवां अवाहाः ।

तमूहथुर्नभिरात्मन्वतीभिरन्तरिक्षप्रुद्धिरपोदकाभिः ॥

Tugra, verily, Ásvins, sent his son Bhujya to sea, as a dying man parts with his riches; but you brought him back in vehicles of your own, floating over the ocean and keeping out the waters.

ऋ.१-११६-४

तिस्रः क्षपस्त्रिरहातिव्रजन्दिनासत्या भुज्युमूहथुः पतंगैः ।

समुद्रस्य धन्वन्नाद्रस्य पारे त्रिभीः रथैः शतपद्भिः षळश्वैः ॥

Three days and Three nights, Nāsatyās, have you conveyed Bhujya in three rapid, revolving cars having a hundred feet and drawn by six horses along the dry shore of the seas.

ऋ.१-११६-५

अनारम्भणे तदवीरयेथामनास्थाने अग्रभणे समुद्रे ।

यदश्विना ऊहथुर्भुज्युमस्तं शतारित्रां नावमातस्थिवांसं ॥

This exploit you achieved, Ásvins, in the ocean where there is nothing to give support, nothing to rest upon, nothing to cling to, that you brought Bhujya sailing in a hundred oared ship to his father's house.

ऋ.१-११६-६

यमश्विना ददथुः श्वेतमश्वमघाश्वाय शश्वदित्स्वस्ति ।

तद्वां दात्रं माहि कीर्त्तन्यं भूत्यैद्वो वाजी सदमिद्धव्यो अर्यः ॥

Ásvins, the white horse you gave to Pedu, whose horses were indestructible was ever to him (brought) success. That, your precious gift is always to be celebrated; the horse of pedu, the scatterer (of enemies) is always to be invoked.

ऋषिः कक्षीवान् दैर्घतमस औशिजः, देवता - अश्विनौ

ऋ.१-११७-१४

युवं तुग्राय पूर्व्यैभिरेवैः पुनर्मन्यावभवतं युवाना ।

युवम् भुज्युमर्णसो निः समुद्राद्विभिरूहथुर्ऋद्रेभिरश्वैः ॥

Dissipators of affliction, as you were praised with bountiful praises by Tugra, so were you again adored (by him), when you brought Bhujya safe from the tossing ocean with swift ships and rapid horses.

ऋ.१-११७-१५

अजोहवीदश्विना तौग्र्यो वां प्रोळ्हः समुद्रमव्यथिर्जगन्वान् ।



निष्टमूहथुः सुयुजा रथेन मनोजवसा वृषणास्वस्ति ।।

Bhujya, the son of Tugra, brought back by you, Ásvins, (to his father) glorified you when he had crossed the ocean in safety and you bore him showerer (of benefits), with your well-harnessed chariot, swift as thought to safety.

ऋषिः - वामदेवो गौतमः, देवता- ऋभवः

ऋ.४-३६-१

अनश्वो जातो अनभीशुरक्थ्यो ३ रथस्त्रिचक्रः परिवर्तते रजः ।

महत्तद्वो देव्यस्य प्रवाचनं द्यामृभवः पृथिवीं यच्च पुष्यथः ।।

The glorious three-wheeled chariot of the Ásvins made, R̥bhus, (by you) traverses the firmament without the horses, without the rein; great was that proclamation of your divine (power), by which, R̥bhus, you cherish heaven and earth.

ऋषिः - भरद्वाजो बार्हस्पत्यः, देवता - पूषा

ऋ.६-५८-३

यास्ते पूषन्नावो अंतः समुद्रे हिरण्ययीरंतरिक्षे चरन्ति ।

ताभिर्यासि दूत्यां सूर्यस्य कामेन कृतं श्रव इच्छमानः ।।

With those your golden vehicles, which navigate the ocean-firmament. You discharge the office of messenger of the Sun; Desirous of the sacrificial food, you are propitiated by (that which is) willingly offered.

ऋषिः - भरद्वाजो बार्हस्पत्यः, देवता - अश्विनौ

ऋ.६-६२-६

ता भुज्यं विभिरन्ध्रः समुद्रात्तुग्रस्य सूनूमूहथू रजोभिः ।

अरेणुभिर्योजनेभिर्भुजता पतत्रिभिरर्णसो निरुपस्थात् ।।

They bore up from the waters, from the ocean, by the winged horses attached to their car, (passing) by roads unsoiled by dust, Bhujya, the son of Tugra; they (bore him) from out of the laps of the water.

ऋ.६-६२-७

वि जयुषा स्थ्या यातमद्रिं श्रुतं हवं वृषणा वध्रिमत्याः ।

दशस्यन्ता शयवे पिप्यथुर्गामिति च्यवाना सुमतिं भुरण्यू ।।

Riding in your car, you have penetrated the mountains by your triumphant chariot; showerers (of benefits) you heard the invocation of Vadhrimati; you have nourished, bountiful givers, the cow for Śayu - and in this manner displaying benevolence wherever you are present.



Appendix B

On Vaimānika Prakaraṇa

(1) The Thirty-two Secrets (Rahasya)

Māntrika, Tāntrika, Kṛtaka, Am̐tarāla, Gūḍha, Dṛśya, Adṛśya, Parōkṣa, Aparōkṣa, Saṅkōcana, Vistṛta, Virūpakaraṇa, Rūpāntara, Surūpa, Jyōtirbhāva, Tamōmaya, Pralaya, Vimukha, Tāra, Mahāśabda Vimōhana, Laṅghana, Sarpagamana, Capala, Sarvatōmukha, Paraśabdagrāhaka, Rūpākaraṇa, Kriyāgrahaṇa, Dikpradaśana, Ākāśākāra, Jaladarūpa, Stabdha, Karaṇa.

(2) The Mirrors (Darpaṇa)

Viśvakriyā, Śaktyākaraṇa, Vairūpya, Kuṇṭiṇī, Piñjalā, Guhāgarbha, Raudrī.

(3) The Thirty-two machines (Yantra)

Viśvakriyādarśa, Śaktyākaraṇa, Parivēśakriyā, Aṅgōpasamhāra, Sarvāṅgasundara, Vistṛtakriyā, Vairūpya, Padmacakramukha, Vicitraka, Kuṇṭiṇīśakti, Puṣpiṇika, Piñjulādarśa, Mahōhara, Nālapaṇcaka, Guhāgarbha, Tamō, Pañcavātāskandanāla, Vātāskandanākīla, Vidyut, Śabdakēndramukha, Vidyutdvādaśaka, Prāṇakuṇḍalinī, Śaktyudgama, Vakraprasāraṇa, Śaktipaṇjarakīlaka, Śiraḥkīlaka, Śabdākaraṇa, Paṭaprasāraṇa, Diśāmpati, Paṭṭikābhṛaka, Sūryaśaktyapakaraṇa, Apasmāradhūmaprasāraṇa, Stambhana, Vaiśvānaranāla

(4) Twenty five types of Aircrafts in Kaliyuga (Kṛtaka)

Śakuna, Sundara, Rukma, Maṇḍala, Vakratuṇḍa, Bhadraka, Rucaka, Vairāja, Bhāskara, Gaja, Āvarta, Pauṣkala, Virañci, Nandaka, Kumuda, Mandara, Haṃsa, Śukasya, Sōma, Krauñcaka, Saimhika, Pañcabāṇa, Ouryāyaṇa, Puṣkara, Kōḍaṇḍa

(5) Various Technical texts named in Vaimānika Prakaraṇa

Kriyāsāraḥ, Yantrasarvasvam (Bharadvājakṛtam), Śaunakīyam, Lōhatantram, Darpaṇaprakaraṇam, Vimānacandrikā, Vyōyānatāntram, Yantrakalpaḥ, Vyōmayānārkaprakāśaḥ, Khēṭayānapradīpikā, Yānavinduḥ, Mañibhadrakārikā, Lōhaprakaraṇam, Śaktitantram, Darpaṇasāstram, Lōhasarvasvam, Dhātusarvasvam (Bōdhāyanakṛtam), Saṃskāraratnākaraḥ, Mañiprakaraṇam, Śabdamahōdadhiḥ, Paṭakalpaḥ, Yantraprakaraṇam, Agatattvalahari (Āśvalāyanakṛta), Paṭapradīpikā, Cāranibandhanagranthaḥ, Śaktisarvasvam, R̥tukalpaḥ, Varṇasarvasvam, Mūlārkaprakāśikā, Kṣīrīpaṭakalpaḥ, Śaṇanir̥yāsacandrikā, Nālikānir̥ṇayaḥ, Mañikalpapradīpikā, Vṛhatkāṇḍam, Paṭṭikānibandhanam, Khēṭavilāsagranthaḥ, Pārthivapākakalpaḥ, Udbhijjatattva Sārāyaṇam, Gatiniṇṇayādhyāyaḥ, Lōhatattvaparakaraṇam, Saudāminīkalā (Īśvarakṛtā), Śabdanibandhanam, Nir̥yāsakalpaḥ.



Nāmārthakalpasūtram (Atrikṛtam), Sarvaśabdanibandhanam, Khēṭasarvasvam, Drāvakaṇḍaprakaraṇam, Khēṭayantram, Lōharatnākaraḥ, Nirṇayādhikāraḥ, Mūṣakalpaḥ, Kuṇḍakalpaḥ, Kuṇḍanirṇayaḥ, Bhastrikānibandhanam, Mukurakalpaḥ, Darpaṇakalpaḥ, Parāṅkuśaḥ, Sammōhakriyākāṇḍam, Aṁśubōdhinī, Prapañcasāraḥ, Śaktibījam, Śaktikaustubham, Yantrakalpataruḥ (Lallapraṇītaḥ), Mañiratnākaraḥ, Paṭasaṁskāraratnākaraḥ, Viṣanirṇayādhikāraḥ, Aśanakalpaḥ, Pākaśarvasvam, Lōhādhikaraṇam, Bōdhānandakārikā (Bōdhānandakṛtā), Lōharahasyam, Paribhāṣācandrikā, Viśvambhara Kārikā (Viśvambharakṛtā), Saṁskāradarpaṇam, Pralayapaṭalam, Ṣaḍgarbhavivēkaḥ, Raghūdayaḥ, Śaktisūtram (Agastyakṛtam), Śuddhavidyākālāpam (Āśvalāyanakṛtam), Brahmāṇḍasāraḥ (Vyāsapraṇītaḥ), Aṁśumatanttram (Bharadvājakṛtam), Chandaḥkaustubhaḥ (Parāśarapraṇītaḥ), Kaumudī (Simhakōṭhakṛtā), Rūpaśaktiprakaraṇam (Aṅgīrasakṛtam), Ākāśatantram (Bharadvājakṛtam), Lōkasaṅgrahaḥ (Visaraṇakṛtaḥ), Prapañcalahari (Vasiṣṭhakṛtā), Jīvasarvasvam (Jaiminikṛtam), Karmābdhipāraḥ (Āpastambhakṛtaḥ), Rukhṛdayam (Atrikṛtam), Vāyutatvaparakaraṇam (Śakaṭāyanakṛtam), Vaiśvānaratantram (Nārada Kṛtam), Dhūmaprakaraṇam (Nāradaṅkṛtam), Ōṣadhikalpaḥ (Atrikṛtaḥ), Vālmīkigaṇitam (Vālmīkikṛtam), Lōhaśāstram (Śakaṭāyanakṛtam)

(6) Various Scholars remembered

Nārāyaṇa Muni, Śaunaka, Garga, Vācaspati, Cākrāyaṇi, Dhunḍinātha, Viśvanātha, Gautama, Lalla, Viśvambhara, Agastya, Buḍila, Gōbhila, Śakaṭāyana, Atri, Kapardī, Gālava, Agnimitra, Vātāpa, Sāmba, Bōdhānanda, Bharadvāja, Siddhanātha, Īśvara, Āśvalāyana, Vyāsa, Parāśara, Simhakōṭha, Aṅgīrā, Visaraṇa, Vasiṣṭha, Jaimini, Āpastamba, Baudhāyana, Nārada, Vālmīki.

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