

# Vedic Ion Engine

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*Abstract- In 1895 on a beach in the city of Mumbai (Bombay, Maharashtra, India), Shivkar Bapuji Talpade, a Sanskrit scholar, proved that heavier-than-air flight was indeed possible. Talpade put his knowledge of Sanskrit at the disposal of his creative intellect and constructed an aircraft according to the description given in the rig-veda. it is reported that this flying machine gained an altitude of 1500 ft. most aptly, he called his aircraft the "Marutsakha" - friend of the wind. The engine now being developed for future use by NASA, by some strange coincidence, also uses Mercury bombardment units powered by Solar cells. not only had the idea of an Ion Engine been conceived long before Dr Goddard, but it had also been materialized in the form of Talpade's Marutsakha Aircraft. Scientific thought began in Vedic civilization earlier than in the West; we should not ignore that fact in our narration of the history of science.*

**Keywords-** Agastya Samhita, Rigvedadic Bhashya Bhumika, Vedic Ion Engine, Marutsakha.

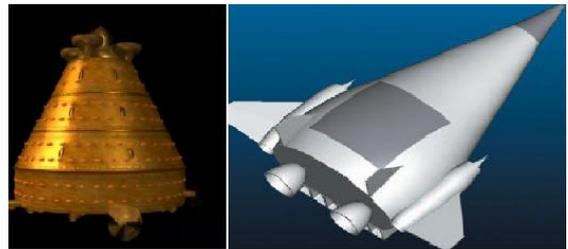
## I. ANCIENT INDIAN AERONAUTICS

Space planes of Ancient India. Flight in the earth's atmosphere and to space is thought to have originated in the 20th Century. However, that may not be the case. In the Vedic literature of India, recording events that occurred 12,000 to 15,000 years ago, there are many descriptions of flying machines that are generally called Vimanas. The Vedas speaks of "Two storied celestial chariots with many windows" "They roar off into the sky until they appear like comets." The Vedas and various Sanskrit books describe at length these chariots, "Powered by winged lighting...it was a ship that soared into the air, flying to the solar and stellar regions."



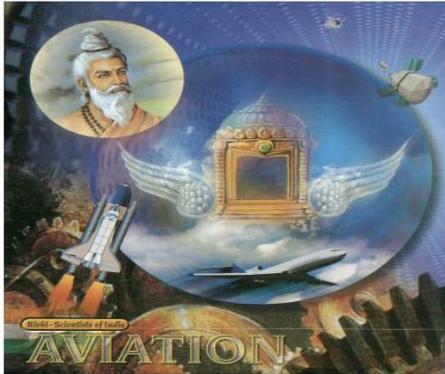
A Journey from Vedic India's 'Vimana' To Modern India's Hyper plane clearly shows us that There is close resemblance between the recent US "Falcon" and Indian "Hyper plane" space plane designs to the "Shakuna" and "Rukma" Vimana's, and the UK "Skylon" is cigar-shaped, like the Vimana like "Vailixi". That the "Shakuna", "Rukma" and "Vailixi" were designed and

built 12,000-15,000 years ago indicates that once again after a gap of millennia, mankind has embarked on development of systems and technologies for safe, affordable flight direct to space from a runway take-off. The ancient Hindus could navigate the air, and not only navigate it but fight battles in it like so many war-eagles, combating for the domination of the clouds. To be so perfect in aeronautics they must have known all the arts and sciences relating to the science, including the strata and currents of the atmosphere, the relative temperature, humidity, density and specific gravity of the various gases....." – Col. Olcott in a lecture in Allahabad. He was the friend of Swami Dayanand Saraswati and he spoke this after going through the series of lecture gave by Swami Dayanand in Pune during 20 Jun to 05 Sep 1975. These lectures are available in the form of printed book in Hindi called "Upadesh Manjari"



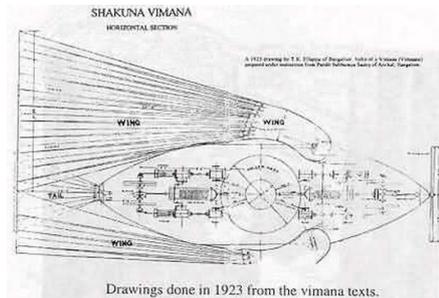
The Vedas are the oldest document of the human race includes references to the following modes of transportation: Jalayan – a vehicle designed to operate in air and water (Rig Veda 6.58.3); Kaara- Kaara- Kaara- a vehicle that operates on ground and in water. (Rig Veda 9.14.1); Tritala- Tritala- Tritala- a vehicle consisting of three stories. (Rig Veda 3.14.1); Trichakra Ratha – Trichakra Ratha – Trichakra Ratha – a three-wheeled vehicle designed to operate in the air. (Rig Veda 4.36.1); Vaayu Ratha- Vaayu Ratha- Vaayu Ratha- a gas or wind-powered chariot. (Rig Veda 5.41.6); Vidyut Ratha- Vidyut Ratha- a vehicle that operates on power. (Rig Veda 3.14.1). Ancient Sanskrit literature is full of descriptions of flying machines – Vimanas. From the many documents found it is evident that the scientist-sages Agastya and Bharadwaja had developed the lore of aircraft construction. The "Agastya Samhita" gives us Agastya's descriptions of two types of aeroplanes. The first is a "chchatra" (umbrella or balloon) to be filled with hydrogen. The process of extracting hydrogen from water is described in elaborate detail and the use of electricity in achieving this is clearly stated. This was stated to be a primitive type of plane, useful only for escaping from a fort when the enemy had set fire to the

jungle all around. Hence the name “Agniyana”. The second type of aircraft mentioned is somewhat on the lines of the parachute. It could be opened and shut by operating chords. This aircraft has been described as “vimanadvigunam” i.e. of a lower order than the regular aeroplane.



Aeronautics or Vaimaanika Shastra is a part of Yantra Sarvasva of Bharadwaja. This is also known as Brihadvimaana Shastra. Vaimaanika shastra deals about aeronautics, including the design of aircraft, the way they can be used for transportation and other applications, in detail. The knowledge of aeronautics is described in Sanskrit in 100 sections, eight chapters, 500 principles and 3000 slokas. Great sage Bharadwaja explained the construction of aircraft and way to fly it in air, on land, on water and use the same aircraft like a sub-marine. He also described the construction of war planes and fighter aircraft. Vaimaanika Shastra explains the metals and alloys and other required material, which can be make an aircraft imperishable in any condition. Planes which will not break (abhedyā), or catch fire (adaahya) and which cannot be cut (achchedya) have been described. Along with the treatise there are diagrams of three types of aeroplanes – “Sundara”, “Shukana” and “Rukma”. The aircraft is classified into three types- Mantrika, Tantrika and Kritaka, to suit different yugas or eras. In kritayuga, it is said, Dharma was well established. The people of that time had the devinity to reach any place using their Ashtasiddhis. The aircraft used in Tretayuga are called Mantrikavimana, flown by the power of hymns (mantras). Twenty-five varieties of aircraft including Pushpaka Vimana belong to this era. The aircraft used in Dwaparayuga were called Tantrikavimana, flown by the power of tantras. Fiftysix varieties of aircraft including Bhairava and Nandaka belong to this era. The aircraft used in Kaliyuga, the on-going yuga, are called Kritakavimana, flown by the power of engines. Twenty-five varieties of aircraft including “Sundara”, “Shukana” and “Rukma” belong to this era. Bharadwaja states that there are thirty-two secrets of the science of aeronautics. Of these some are astonishing and some indicate an advance even beyond our own times. For instance the secret of “para shabda graaha”, i.e. a cabin for listening to conversation in

another plane, has been explained by elaborately describing an electrically worked sound-receiver that did the trick. Manufacture of different types of instruments and putting them together to form an aircraft are also described.



It appears that aerial warfare was also not unknown, for the treatise gives the technique of “shatru vimana kampana kriya” and “shatru vimana nashana kriya” i.e. shaking and destroying enemy aircraft, as well as photographing enemy planes, rendering their occupants unconscious and making one’s own plane invisible. In Vastraadhikarana, the chapter describing the dress and other wear required while flying, talks in detail about the wear for both the pilot and the passenger separately. Ahaaraadhikarana is yet another section exclusively dealing with the food habits of a pilot. This has a variety of guidelines for pilots to keep their health through strict diet. Bhardwaja also provides a bibliography. He had consulted six treatises by six different authors previous to him and he gives their names and the names of their works in the following order: Vimana Chandrika by Narayanamuni; Vyoma Yana Mantrah by Shaunaka; Yantra Kalpa by Garga; Yana Bindu by Vachaspati; Kheta Yaana Pradeepika by Chaakraayani; Vyoma Yaanarka Prakasha by Dundi Natha. As before Bharadwaja, after him too there have been Sanskrit writers on aeronautics and there were four commentaries on his work. The names of the commentators are Bodh Deva, Lalla, Narayana Shankha and Vishwambhara.



Evidence of existence of aircrafts are also found in the Arthasastra of Kautilya (c. 3rd century B.C.). Kautilya mentions amongst various tradesmen and technocrats the Saubhikas as `pilots conducting vehicles in the sky`. Saubha was the name of the aerial flying city of King Harishchandra and the form `Saubika` means `one who flies or knows the art of flying an aerial city`. Kautilya

uses another significant word 'Akasa Yodhinah', which has been translated as 'persons who are trained to fight from the sky.' The existence of aerial chariots, in whatever form it might be, was so well-known that it found a place among the royal edicts of the Emperor Asoka which were executed during his reign from 256 B.C. – 237 B. C. It is interesting to note that the Academy of Sanskrit Research in Melkote, near Mandya, had been commissioned by the Aeronautical Research Development Board, New Delhi, to take up a one-year study, 'Non-conventional approach to Aeronautics', on the basis of Vaimanika Shastra. Dr. N G Dongre has worked on 1- Prasasthipada (Commentary on Vaisheshik Darshan), and 2- Amshubodhini of Maharshi Bharadwaj. He had prepared "Dhwanth pramapak yantra" (Radiation Measuring Machine), using "Prakash sthambhnaabhid loha mishradhathu" and also explained about Spectroscopy in Ancient India according to the Amshubodhini. Now Prof. Vijay Didolkar, Dept. Of Metallurgy, VNIT, Nagpur is giving this a commercial exposure. A glass-like material which cannot be detected by radar has been developed by Prof Dongre, a research scholar of Benaras Hindu University. A plane coated with this unique material cannot be detected using radar. But perhaps the most interesting thing, about the Indian science of aeronautics and Bharadwaja's research in the field was that they were successfully tested in actual practice by an Indian over hundred years ago.

**II. MARUTSAKHA VIMANA**

In 1895, eight years before the Wright Brothers, Shivkar Bapuji Talpade and his wife gave a thrilling demonstration flight on the Chowpatty beach in Mumbai. The name of the Unmanned Air vehicle is Marutsakha vimana. It was 17, December 1903 at Kitty Chowk, North Carolina, USA. The most awaited men's dream visually came true. It was a breakthrough in the history of mankind. Yes! Orville and Wilbur Wright, commonly mentioned as the Wright brothers proved that it is possible for human to travel through air, by flying the world's first aircraft. But the question is was that the first object to fly in the space?



Shivkar Bapuji Thalpade, an Indian scientist and a Sanskrit scholar along with his wife at chowpathy beach was found more excited and anxious that day. The people around found that something sensational are going to happen there. Some knew what it was, some did

not. Some were putting their instinct to work. A huge mass of crowd has accumulated and among them was Shri Sayaji Rao Gaekwa, who was the Maharaja of Baroda during that time and the most influenced famous scholar justice Mahadeva Govin-da Ranade. Everyone there was waiting with anxiety and before that anxiety drowned that miracle happened. Yes! The world's first unmanned aircraft named *Marutsakhā* was thrown into the space and it tarred the sky at a velocity of about 40,000 Km/hr. After reaching a height of more than 1500 feet it landed safely without any damage. Between the hustle, Talpade was literally appreciated by Maharaja at that moment itself. It was Maharaja's happiest moment for which he has been waiting for long period.

This demonstration was attended by eminent citizens including, among others, His Highness Maharaja Sayajirao Gaekwand of Baroda and Mr. Justice Ranade, and was reported in "The Kesari" a leading Marathi daily newspaper.



**III. TALPADE'S RESEARCH**

Shivkar Babuji Thapled (1864 – 1917 Sep 1917, Maharashtra), from his childhood developed his dreams of flying and getting into space. He was a great Sanskrit scholar and started searching the possibilities of man flying in the space in ancient Indian scripts, Vedas. He thoroughly learned Sanskrit, then Vaisheshik Darshan (Vedic Physics) according to the Advt. Published by him on his Marathi book on Vimana called Prachina Vimana Kalecha Sodha. Later Businessmen of Mumbai facilitates the meeting of Pandit Subraya Shastri and Talpade ji in Mumbai. They brought him from Bengaluru in 1915 as explained in details in the autobiography of Pandit Subraya Shastri. The ancient scripts containing Vimanika Sasthras (Aeronautics Theory). On that fine morning, Talpade was lucky enough to meet Shri Suparaaya Sasthri. Sasthri gave him a bundle of treasures which contained suthras (formulas) of making an aircraft, written by the great rishi Bharadwaja. After this incident Talpade continued his work more seriously than before. It may be too hard to believe that modern day aircrafts and even most advanced one are discussed in Vedas which are written some 10,000 years ago. But, Talpade was fully dependent on all four Vedas and book of Swami

Dayanand Saraswati called Rigvedadic Bhashya Bhumika, and Vimanika Sashthra. "Vaimanika Shastra deals about aeronautics including the design of aircraft the way they can be used for transportation and other applications in detail. The knowledge of aeronautics is described in Sanskrit in 100 sections, eight chapters, 500 principles and 3000 slokas including 32 techniques to fly an aircraft. In fact, depending on the classifications of eras or Yugas in modern Kaliyuga aircraft used are called Krithakavimana flown by the power of engines by absorbing solar energies!" It is feared that only portions of Bharadwaja's masterpiece Vaimanika Shas-tra survive today." People believed that In 1895 after the news release in the media, few years later talpade and sashtri were jailed by the British Government. Maharaja was warned literally. Few years later, talpade returned home and he withdrew his research. He passed away while the research work was on, from the autobiography of Pandit Subraya Shastri). After his death in 1917, it is said that his relatives sold some of his important works to Ralley Brothers. Then some materials came to Ministry of Defence and some were sent to HAL, Benagaluru later by their relatives. A model reconstruction of Marutsakhā was exhibited at an exhibition on aviation at Vile Parle, and Hindustan Aeronautics Limited has preserved documents relating to the experiment.

#### IV. HIJACKED INDIAN AERONAUTICS DR. GODDARD ION ENGINE

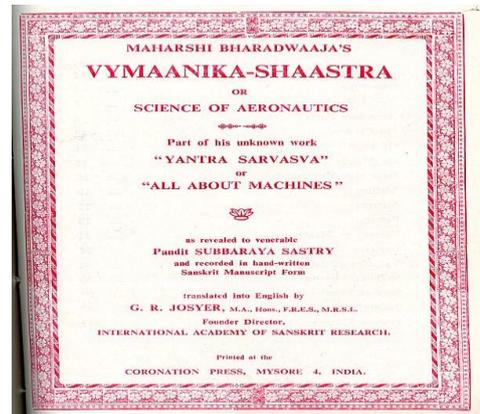
An even more astonishing feature of Talpade's aircraft was the power source he used- An Ion Engine. Mercury Engine is explained in another work of Raja Bhoja called Samarangana Sutradhara, first published in 1924 & 1925. Talpade first Vimana is from Vedas, which I used to call the Vedic Vimana, and after learning Yantrasarwaswa-Vaimanika Prakarana, he prepared Marutsakha, one of the Viman out of the 8 different types explained. The theory of the Ion Engine has been credited to Robert Goddard, long recognized as the father of Liquid-fuel Rocketry. It is claimed that in 1906, long before Goddard launched his first modern rocket, his imagination had conceived the idea of an Ion rocket. But the fact is that not only had the idea of an Ion Engine been conceived long before Dr Goddard, it had also been materialized in the form of Talpade's aircraft.



SHIVKAR BAPUJI'S FIRST INDIAN PLANE (BALOON) OVER MUMBAI CHWUPATTI SEA FACE 1876

Mr. Talpade, a resident of Mumbai, was an erudite scholar of Sanskrit literature, especially of the Vedas, an inventor and a teacher in the School of Arts. Vedas are available since time immemorial but it is only the commentaries of Swami Dayanand Saraswati, which gives great details about the Vimans. No other scholar was able to extract the Concept of Vimans from Vedas before Swami Dayanand, His deep study on this led him to construct an aeroplane in conformity with descriptions of aircraft available in the Vedas and he displayed it in an exhibition arranged by the Bombay Art Society in the Town Hall in 1905. Its proving the star attraction of the exhibition encouraged its maker to go deeper into the matter and see if the plane could be flown with the aid of mercurial pressure. For the one hundred and ninetieth "richa" (verse) of the Rig Veda and the aeronautical treatise of Bharadwaja mention that flying machines came into full operation when the power of the sun's rays, mercury and another chemical called "Naksha rassa" were blended together. This energy was, it seems, stored in something like an accumulator or storage batteries. The Vedas refer to eight different engines in the plane and Bharadwaja adds that they are worked by electricity.

He was a scholar of Sanskrit and from his young age was attracted by the Vaimanika Sastra (Aeronautical Science) expounded by the great Indian sage Maharishi Bhardwaja. One western scholar of Indology Stephen-Knapp has put in simple words or rather has tried to explain what Talpade did and succeeded!



#### V. NASA USING MERCURY VORTEX ENGINE

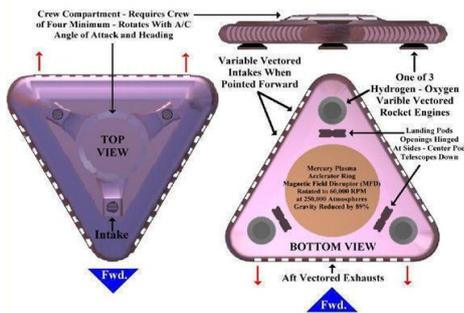
*What is special about Marutshakha?*

**Drawings derived from Vamanika Sashtra:**

The importance of the Wright brothers lies in the fact, that it was a manned flight for a distance of 120 feet and Orville Wright became the first man to fly. But Talpade's unmanned aircraft flew to a height of 1500 feet before crashing down and the historian Evan Koshtka, has described Talpade as the 'first creator of an aircraft'. Marutshakha was the first model to have an Ion Mercury Vortex Engine. The Vaimanika Shastra

describes in detail, the construction of what is called, the mercury vortex engine the forerunner of the ion engines being made today by NASA. The information on the mercury engines can be found in the ancient Vedic text called Samaranga Sutradhara. This text also devotes 230 verses, to the use of these machines in peace and war. The Indologist William Clarendon, who has written down a detailed description of the mercury vortex engine in his translation of Samaranga Sutradhara quotes thus 'Inside the circular air frame, place the mercury-engine with its solar mercury boiler at the aircraft center. By means of the power latent in the heated mercury which sets the driving whirlwind in motion a man sitting inside may travel a great distance in a most marvellous manner. Four strong mercury containers must be built into the interior structure. When these have been heated by fire through solar or other sources the vimana (aircraft) develops thunder-power through the mercury.

**USAF Top Secret Nuclear Powered Flying Triangle - The TR-3B**



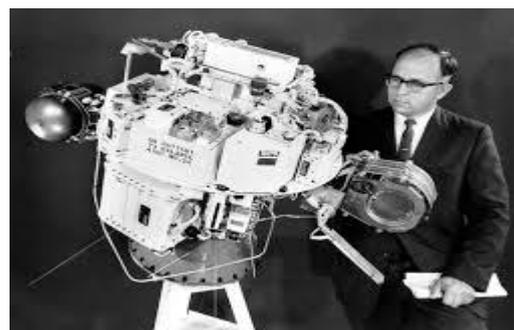
NASA (National Aeronautical and Space Administration) world's richest/ most powerful scientific organisation is trying to create an ion engine that is a device that uses a stream of high velocity electrified particles instead of a blast of hot gases like in present day modern jet engines. Surprisingly according to the bi-monthly Ancient Skies published in USA, the aircraft engines being developed for future use by NASA by some strange coincidence also uses mercury bombardment units powered by Solar cells! Interestingly, the impulse is generated in seven stages. The mercury propellant is first vaporised fed into the thrusters discharge chamber ionised converted into plasma by a combination with electrons broke down electrically and then accelerated through small openings in a screen to pass out of the engine at velocities between 1200 to 3000 kilometres per minute! But so far NASA has been able to produce an experimental basis only a one pound of thrust by its scientists a power derivation virtually useless. But 108 years ago Talpade was able to use his knowledge of Vaimanika Shastra to produce sufficient thrust to lift his aircraft 1500 feet into the air! The Vaimanika Shastra manuscript later appeared at Institute of Oriental Studies, Maharaj Sayajirao University, Varodara by 1924 The text was

published in Hindi in 1943, called Vaimana Shastra, available in 2 copies. Later in 1958 called Bhruhat Vimana Shastra, after getting more 21 copies from Pune and later in English by G.R. Josyer, titled *Vymanika Shastra*. Josyer's edition, also added illustrations drawn by T. K. Ellappa, a draughtsman at a local engineering college in Bangalore, under the direction of Shastry, which had been missed in the 1958 edition.

**VI. MERCURY IN ION ENGINE**

**NASA'S MERCURY ION ENGINE**

Ion propulsion technology development at Glenn began when Dr. Harold Kaufman, now retired from NASA, designed and built the first broad-beam electron-bombardment ion engine in 1959. It used mercury as fuel, but is otherwise similar to the engine flying today on DS1. The laboratory tests of variations of the original ion engine were promising enough for Glenn to begin suborbital flight tests in the early 1960's. By 1964, an ion engine launched on the Space Electric Rocket Test I (SERT I) operated for all of its planned 31 minutes before returning to Earth. In 1970, two modified ion engines were launched on SERT II; one operated for nearly three months and the other for more than five. Both engines suffered grid shorts, believed to have been caused by debris from thruster grid wear, before the planned end of the mission. After an attitude control maneuver cleared its grid of the short in 1974, one of the engines was started and was operated on and off for six more years. The information learned from these genuine space success stories was used to refine and improve the technology that today flies on communications satellites and, of course, on DS1.



**VII. LESSONS LEARNED BY NASA**

Early ion engines used mercury or cesium instead of xenon as propellants. (Glenn researchers had worked on cesium ion engine technology in the mid 1950's.) But both proved to be difficult to work with. At room temperature, mercury is a liquid and cesium is a solid, making them easy to store. But both had to be heated to turn them into gases. Then there was the cleanup. After exiting the ion engine, some mercury or cesium atoms would condense onto the ground test hardware, causing numerous cleanup difficulties. In the 1970's, NASA

managers decided that if ion propulsion research was to continue, it would have to be environmentally clean and less hazardous. Glenn researchers soon turned to xenon as a cleaner, simpler fuel for ion engines, with many of the same characteristics as mercury.

One of the first xenon ion-engine-like devices ever flown was a Hughes Research Laboratories design launched in 1979 on the Air Force Geophysics Laboratory's Spacecraft Charging at High Altitude (SCATHA) satellite. It was used, not to propel the spacecraft, but to change its electrical charge. Researchers then studied the effects of the "charging" on spacecraft system performance. In 1997, Hughes launched the first commercial use of a xenon ion engine on the communications satellite PanAmSat 5. This ion engine is used for station keeping that is, keeping the satellite in its proper orbit and orientation with respect to Earth.

**But according to the study, if pure mercury is used, it could give better efficiency**

Flight thruster	Launch date	Beam diameter, cm	Propellant	Specific impulse, s
SERT I	1964	10	Mercury	~5000
SERT II	1970	15	Mercury	4200
XIPS-13	1997	13	Xenon	2565

### VIII. MERCURY ION ENGINE OF INDIAN VIMANAS

Vimanas of Ancient India used mercury as fuel in their ion engines. The mercury used was a purified one. Mercury has been known to Indians 11000 years ago. Dharmidhar Samhita gives the 16 steps to purify Mercury and make a SOLID Shiva Lingam out of it. For the one hundred and ninetieth "richa" (verse) of the Rig Veda and the aeronautical treatise of Bharadwaja mention that flying machines came into full operation when the power of the sun's rays, mercury and another chemical called "Naksha rassa" were blended together. This energy was, it seems, stored in something like an accumulator or storage batteries. The Vedas refer to eight different engines in the plane and Bharadwaja adds that they are worked by electricity.



### RASA SHASTHRA

In Ayurvedic medicine, the traditional medical lore of Hinduism, rasa shastra is a process by which

various metals and other substances, including mercury, are purified and combined with herbs in an attempt to treat illnesses.

### METHODS

The methods of rasa shastra are contained in a number of Ayurvedic texts, including the Charaka Samhita and Susruta Samhita. An important feature is the use of metals, including several that are considered to be toxic in evidence-based medicine. In addition to mercury, gold, silver, iron, copper, tin, lead, zinc and bell metal are used. In addition to these metals, salts and other substances such as coral, seashells, and feathers are also used. The usual means used to administer these substances is by preparations called bhasma, Sanskrit for "ash". Calcination, which is described in the literature of the art as shodhana, "purification", is the process used to prepare these bhasma for administration. Sublimation and the preparation of a mercury sulfide are also in use in the preparation of its materia medica. A variety of methods are used to achieve this. One involves the heating of thin sheets of metal and then immersing them in oil (taila), extract (takra), cow urine (gomutra) and other substances. Others are calcined in crucibles heated with fires of cow dung (puttam). Ayurvedic practitioners believe that this process of purification removes undesirable qualities and enhances their therapeutic power.

### TOXICITY

Modern medicine finds that mercury is inherently toxic, and that its toxicity is not due to the presence of impurities. While mercury does have anti-microbial properties, and formerly was widely used in Western medicine, its toxicity does not warrant the risk of using it as a health product in most circumstances. The Centers for Disease Control and Prevention have also reported a number of cases of lead poisoning associated with Ayurvedic medicine. Other incidents of heavy metal poisoning have been attributed to the use of rasa shastra compounds in the United States, and arsenic has also been found in some of the preparations, which have been marketed in the United States under trade names such as "AyurRelief", "GlucoRite", "Acnenil", "Energize", "Cold Aid", and "Lean Plus".



Ayurvedic practitioners claim that these reports of toxicity are due to failure to follow traditional practices in the mass production of these preparations for sale, but modern science finds that not only mercury, but also lead is inherently toxic. We can improve efficiency of ion engines, by using mercury purified by rasa shashtra.

### IX. CONCLUSION

West faked our history and Facts do not cease to exist because they are ignored. However shivkur Bapuju talpade did successful trial of *Marutsakhā* which was thrown into the space and it tarred the sky at a velocity of about 40,000 Km/hr. After reaching a height of more than 1500 feet it landed safely without any damage. Further study is being done on Marutsakha vimana from writings of Shivkur Bapuji Talpade to continue the experiments. We can use this technology, for military UAV and MAV applications. NASA is also exploring to use this technology but since it is an ancient Indian technology, we should be doing it first.

### ACKNOWLEDGEMENT

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