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# Chapter 1

## Indo-Aryan Traditions and the History of Astronautics<sup>1</sup>

Roberto Pinotti<sup>2</sup>

India is a country which has kept its traditions of mythical flights and battles in the distant past most clearly; Indian gods and heroes fight in the skies, not through dragons or birds: they use “vimanas,” piloted aerial devices with terrible weapons. In 1931 James Churchward was the first western author to quote many ancient Indian texts mentioning these mysterious airships. In the *Ramayana* there is a fine description of a large vimana taking off. “When morning dawned, Rama, taking the celestial car (vimana) Puspaka had sent him by Vivpishand, stood ready to depart. Self-propelled, the car was large and finely painted. It had two stories and many chambers with windows, and was draped with flags and banners. It gave forth a melodious sound as it coursed along its airy way.” But we will read more about “the Puspaka car, that resembles the sun and belongs to my brother, was brought by the powerful Ravan; that aerial and excellent car, going everywhere *at will*, is ready for thee. That car, resembling a bright cloud in the sky, is in the city of Lanka.”

In the *Ramayana*, an epic Ravan comes across Rama’s wife, Sita, in a forest and seizes her. Then he carries her into his vimana and sets off as fast as he can. But all ends well. Rama fights the villain in an aerial battle, Ravan is shot down and Sita restored to her husband. A mysterious weapon called “Indra’s Dart” is responsible for this: “wrapped in smoke and flaming flashes, speeding from the Circled Bow pierced the iron heart of Ravan, laid the lifeless hero low.”

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<sup>1</sup> Presented at the Twenty-Second History Symposium of the International Academy of Astronautics, Bangalore, India, 1988.

<sup>2</sup> Sociologist, FUTURO SRL, Florence, Italy. Member, AIAA.

In any case, vimanas were luminous during their flights. The *Ramayana* describes “the mighty vimana of Ravan coming at me, flaming like fire.” And their beauty and luminescence is mentioned also in the *Mahabharata*:

The radiant vimana gave forth a fierce glow;  
The fully-equipped vimana shone brilliantly;  
The beautiful car-celestial possessed the radiance of fire;  
It seemed there were two suns in the firmament. The whole sky was ablaze when he ascended into it;  
Blazing with a mighty radiance, like a flame on summer night;  
Like a comet in the sky;  
Like a meteor encircled by a mighty cloud;

besides,

when it set out, its roar filled all four points of the compass;

and

Bhima riding in his vimana of solar effulgence, whose noise was like the roaring of thunderclouds . . .

No doubt these descriptions are very similar to the ones of modern, jet-propelled flying machines. In any case vimanas must not be confused with the ordinary battle chariots or cars drawn by horses; the distinction between them in the Sanskrit is as great as that made between carts and airplanes in our Western literature. We may find a good example of this in the *Samsaptakabadha*, in which a battle chariot and a vimana are compared: “When drawn into battle by those white horses, that chariot looked exceedingly resplendent, like a car celestial that is borne along the sky. And like Cakra’s car celestial this chariot could move in a circular course, or move forwards, backwards, and diverse kinds of movement.” There is no possibility of mistaking the meaning of this passage. The Hindu writer knew the difference between war chariots and vimanas exactly as we know the difference between tanks and planes.

We must remember that ancient Hindu writers made a definite distinction between “Daiva” (or myths) and “Manusa” (that is, a factual record). And as far as “Manusa” accounts are concerned, we find in many of them elaborate details for vimana building. For instance, the *Samarangana Sutradhara* has 230 stanzas devoted to the principles of building vimanas and their use in peace and war. According to the text, “manufacturing details of the vimanas is withheld for the sake of secrecy, not out of ignorance. The details of construction are not mentioned for it should be known that . . . were they publicly disclosed the machines would be wrongly used.”

In the *Rig-Vedas*, which date back to 10,000 B.C., Indra, the God of battles, flashes through the sky in an aerial car, waging war against the Asuras (non-Gods), dropping weapons from the sky and destroying cities below. Indra was often associated with the Maruts (the Storm Gods), who piloted vimanas as well. Other gods also depicted as using vimanas are Krishna, Varuna and Pushan, defined “the best pilot of the

air.” In the *Mahabharata's Drona Parva* we find eye-witness accounts of the effects of terrible weapons dropped by vimanas: the *Agneya Weapon* and the *Brahma Weapon*.

A blazing missile possessed of the radiance of smokeless fire was discharged. A thick gloom suddenly encompassed the hosts. All points of the compass were suddenly enveloped in darkness. Evil-bearing winds began to blow. Clouds roared into the higher air, showering blood. The very elements seemed confused. The sun appeared to spin round. The world, scorched by the heat of that weapon, seemed to be in a fever. Elephants, scorched by the energy of that weapon, ran in terror, seeking protection from its terrible force. The very water being heated, the creatures who live in the water seemed to burn. The enemy fell like trees that are burned down in a raging fire. Huge elephants, burned by that weapon, fell all around. Others, scorched, ran hither and thither, and roared around fearfully in the midst of the blazing forest. The steeds and the chariots, burned by the energy of that weapon, resembled the stumps of trees that have been consumed in a forest conflagration. Thousands of chariots fell down on all sides. Darkness then hid the entire army . . . .

“Cool winds began to blow. All points of the compass became clear and bright. Then we beheld a wonderful sight. Burned up by the terrible power of that weapon, the forms of the slain could not even be distinguished. We have never before heard of, or seen, the like of that weapon . . . .

A real Hiroshima-like inferno. As far as the *Brahma Weapon* (also referred to as Indra's Dart) is concerned, it was operated by a circular reflecting mechanism apparently working on a vibration principle (it could be neutralized only by another *Brahma Weapon* opposing the same energy or by the so-called *Varuna Weapon*).

The effects are described in *Drona Parva*: “Drona's son touched water and discharged the ‘Narayana’ (a sort of ‘earthing’?). Violent winds began to blow, showers of rain fell. Peals of thunder were heard, although the sky was cloudless. Earth shook. The seas swelled up in their confusion. Mountain summits split. Darkness set in. . . The *Brahma Weapon* afflicted Partha and all beings. Earth with all her mountains trembled. Terrible winds began to blow. The seas swelled in agitation.” The importance of avoiding metal when the weapon is active is frequently stressed. As Desmond Leslie underlines, the ancient Aryans well knew how the Element Fire could be used in war, as can be seen from their ‘astra weapons’ which include—among the list of projectiles or Soposamhara: Sikharashtra (a flaming-belching missile); Avidyastra (a missile of illusionary powers); the Prasvapana (which caused sleep), and the “Arrow of Sleep” (some kind of gas projectile?); Gandharvastra (a weapon of Vishnu, the Destroyer); Samvarta (a smokescreen or fog producer); Saura (a missile of the Sun God); four kinds of Agni Astras (or fiery missiles which travel in sheets of flame and produce thunder); a number of ‘magical’ weapons controlled by will and sound. There were: the Satyakirti; the Kamarupaka (taking shape at one's will); the Kamaruci (acting according to one's wish); Vajra the Thunderbolt, which required Mantras or ‘sound’ to operate it; and Viruci (a fiery weapon).

All of the above mentioned weapons are listed by a prominent Indian historian, V. R. Ramachandra Dikshittar, in his excellent 1948 book *Warfare in Ancient India*. As far as vimanas are concerned, Dikshittar says that “three movements are usually as-

cribed to those machines—ascending, cruising thousands of miles in different directions in the atmosphere and lastly descending. It is said that in an aerial car one can mount up to the Suryamandala or ‘Solar Region’ (that is, the Solar System) and the Naksatramandala or ‘Stellar Region’ (that is, other stellar systems), and also travel throughout the regions of air above the sea and the earth. These cars are said to move so fast as to make a noise that could be heard faintly from the ground.” “By means of these machines” we may read in the *Samar* (a document designated as “Manusa” or factual record) “human beings can fly in the air and heavenly beings can come down to Earth”.

Depictions of space travel, air raids, total destructions caused by incredible weapons and alleged visits from space, as they are described in Indian texts, and the fact that the characteristics of the “vimana” are almost identical to the alleged characteristics of modern U.F.O.s (Unidentified Flying Objects), caused several authors to make the sensational claims that in Hindu texts we have the proof that extra-terrestrial spaceships visited Earth during Indian pre-history. Since the publication of the 1953 best-seller *Flying Saucers Have Landed* by Desmond Leslie, Winston Churchill’s nephew, many books suggested this interpretation to the general public, from W. Raymond Drake’s works to the international success of Erich Von Däniken’s *Chariots of the Gods?* series. But due to their sensationalistic manner scientists have been able to cast doubt on these works.

Besides, we must remember that these ancient texts are *not* eyewitness accounts, but narrative poems or descriptions of events that have long existed in folk memory and have been handed down orally from one generation to another. As a result, this means we cannot dismiss the religious context of these texts and their particular literary genre, avoiding superficial generalization. And this is far from easy, since Indian society’s timeless belief in Gods performing powerful and spectacular actions is a difficulty, and not a help, for a correct interpretation of the texts.

## Vimanas and Technology

Nevertheless, certain descriptions seem too detailed and “technical” in nature to be labeled mere components of a general myth. According to the *Samar*,

the subdivision of the vimanas’ movements are: slanting vertical ascent; vertical descent; forwards; backwards; normal ascent; normal descent; progressing over long distances, through proper adjustment of the working parts which gives it perpetual motion.

The strength and durability of these machines depend on the material used. Following here are some of the aerial car’s main qualities: it can be invisible; it can carry passengers; it can also be made small and compact; it can move in silence; if sound is to be used there must be great flexibility of all the moving parts which must be made of faultless workmanship; it must last a long time; it must be well covered in; it must not become too hot, too stiff, nor too soft; it can be moved by tunes and rhythms.

The above possibilities, described in this “Manusa” text, surpass a helicopter and a “Sea Harrier” in maneuverability and characteristics. In the Vedic Brahmanas, a description is given of the Agnihotra Vimana, with its *two propelling fires*, the Ahavaniya and the Garhapatya. A very strange detail to be considered just a coincidence and not a definite technical characteristic. The *Samarangana Sutradhara* says:

Strong and durable must the body (of the vimana) be made, like a great flying bird, of light material; inside it one must place the Mercury-engine with its iron heating apparatus beneath. 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 marvellous manner.

Similarly by using the prescribed processes one can build a vimana as large as the temple of the God-in-motion. 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.

According to the *Samar*, “if this iron engine with properly welded joints be filled with mercury, and the fire be conducted to the upper part, it develops power with the roar of a lion.”

The *Drona Parva* gives a beautiful, though veiled, description of how sound, tuned to the will of operators, provided the motive power of the Cukra vimana, one of the greatest ever built:

We shall build a vimana of great power. The *mind* became the ground which supported that vimana. *Speech* became the tracks on which it was to proceed. All speeches and sciences were gathered together within it, all hymns, and the Vedic Sound ‘Vashat’ also. And the syllable ‘Om’ (the fifth syllable of the ‘Ineffable Name’) placed before that car made it exceeding beautiful. When it set out, its roar filled all points of the compass.

All this refers to a propulsion system resulting from the combination of harmonics and mental power and may sound like mere fantasy. Nevertheless, this ante-litteram version of the computerized navigation system of the *Firefox* war plane in a popular science fiction movie surely seems more than a mere poetical representation. As the *Samar* says, “a vimana can be moved by tunes and rhythms.” And even if we are not able to understand how such a propulsion may work, it is evident that this and other descriptions of the vimana inner parts and mechanisms are too detailed and specific to be considered curious coincidences and not attempts to describe and explain definite aspects of a technological nature. But that’s not all. In this light we think it will be better to examine other Hindu texts, extremely interesting for their particular nature.

In 1979, the late Lord David W. Davenport (he died of cancer at 36 in 1984) published in Italy with reporter Ettore Vincenti the book *2000 A.C.: Distruzione Atomica*, an exhaustive report of his studies of the vimanas in Sanskrit literature and of his direct investigations in India and Pakistan. Still untranslated into English, this book (the Italian title stands for: *2,000 B.C.: Atomic Destruction*) is a comprehensive analysis

from both the physiological (Lord Davenport was born in India and his knowledge of Sanskrit was very good) and technological (he was also a former Air Force pilot) points of view of the problem of vimanas. From the beginning of his research, Lord Davenport understood the limited importance of literary narrations, and his attention focused on quite different texts: in particular, he decided to examine *Vymanika Shastra* closely.

As explained in his book, *Vymanika Shastra* has nothing to do with Indian gods and mythology. The text is just a detailed description of vimanas, non-narrative in nature, with no references to battles or wars of gods and men. It could be defined as a sort of scientific treatise or technical manual, and this is evident from the title itself (*Vymanika Shastra* may be translated as Science of Aeronautics). The original text, by Maharishi Bharadwaja, was written in its present Sanskrit form by Pandit Subbaraya Sastry between 1918 and 1923, thanks to Mr. Venkatachaka Sarma, who took the trouble of writing from dictation and collecting Subbaraya Sastry's words. The manuscript was a rare opportunity to preserve ancient concepts handed down orally from one generation to another by Hindu Brahmins, and so the International Academy of Sanskrit Research of Mysore was proud to obtain it and study its contents. Lord Davenport and E. Vincenti reached Mysore, and Mr. G.R. Josyer, chairman of the Academy, let them study the original *Vymanika Shastra* manuscript and illustrations.

This Indian Science of Aeronautics book opens with a vimana's definition: "Experts in the science of aeronautics say that which can fly through the air from one place to another is a Vimana." Then 32 secrets of the working of a vimana a pilot must learn are mentioned, in three categories: the structure of the aerial craft, ascending and descending, and maneuverability. Among these 32 secrets the text describes what today could be defined as photographic ability, radar and cloaking devices, wing expansion and contraction, light projection and use of solar energy, as well as weapons equivalent to heat-seeking air-to-air missiles and poison gas.

After discussing necessary clothing and dietary habits for vimana pilots, the text faces the argument of metallurgy. Unlike many literary descriptions, which depict vimanas as wooden and animal-shaped, *Vymanika Shastra* insists on metal construction of these flying devices, underlining that only special metals with heat-absorbing characteristics are appropriate. Three kinds of metals named *somaka*, *soundalika* and *mourthwika* are mentioned: and by mixing them, 16 kinds of heat-absorbing alloys may be created. Definite mining and melting instructions follow, including the need for 407 different crucibles.

Then we have a discussion of seven kinds of mirrors and lenses that should be installed aboard. And their characteristics range from purely visual to defensive and offensive uses. The so-called "Pinjula's Mirror," for example, offers a sort of visual shield, preventing the pilots' eyeballs from being blinded by "evil rays." And another description mentions the generation of an evil force named *marika* used to shoot down enemy aircraft, and whose nature and effects do not seem too different from what today we call laser technology.

After this the nature of the power source of the vimana is discussed: "The seven kinds of powers which are required by the vimana are produced by seven motors." And they must be installed with wires, springs and wheels. The principles of propulsion, as far as the text's description are concerned, may be defined as electrical and chemical,



but also solar energy was involved. The following passage shows the scientific rigor of the *Vymanika Shastra*:

The *surya mani* (Surya means Sun in Sanskrit) is to be placed at the foot of the vimana's central pole. . . Wires should be passed from the centre in all directions. Then the triple wheels should be set in revolving motion, which will cause the two glass balls inside the glass case to turn with increasing speed rubbing each other, the resulting friction generating a 100 degree power. That power should be conveyed through wires to the *sanjanika mani*. On contact of the power there in the force will be split into 5 streams. Each of the 5 power streams should be connected with one of the *manis*. Mingling with the force in each *mani*, they form 5 new forces. These should be passed by wires to the acid vessel. . . The resulting current should then be passed through wires to the wide-mouthed glass globular vessel. Solar force pregnant with ethereal force should be passed . . . into the vessel.

All this is just an example of the main body of the text, with clear representation of an unknown forgotten technology. The *Vymanika Shastra* distinguishes between four varieties of vimanas: they are the *Rukma Vimana*, the *Sundara Vimana*, the *Tripura Vimana* and the *Shakuna Vimana*. Each of them is described in extremely vivid detail, from its outside construction to the sophisticated workings of its inner machinery (yantras in Sanskrit). As far as their appearance is concerned, the Rukma Vimana and the Sundara Vimana were both conical in shape. The Rukma Vimana had three floors, with electric motors on the first floor, cabins for passengers on the second floor, and a third floor powered with electromagnetism. The Sundara Vimana is very similar in shape but is much more streamlined.

The Tripura Vimana is a larger craft and its shape is quite different. Like the others, "it is operated by the motive power generated by solar rays (surya). Its elongated form is surely much closer to that of a modern blimp or dirigible, and as such it undoubtedly would move at a slower speed than the other vimanas. An important detail to be noted is the fact that the Tripura Vimana was a sort of multi-role craft, adaptable for both land and water travel. Many electric-powered ground wheels could move its huge mass on land as well as in the water like a modern amphibian tank.

Last but not least, we have the Shakuna Vimana. This huge craft might be defined as a cross between a plane and a rocket of our times, and its design might remind one of today's Space Shuttle. Surely it expresses the most complex and sophisticated aeronautical design among all the other descriptions of vimanas mentioned in the *Vymanika Shastra*. Its representations may show the Shakuna more or less elongated, in spite of the fact that it had the most maneuverability of all the vimanas, and Lord Davenport's graphic interpretations (1979) seem much more interesting than the previous ones.

Lord Davenport's technical studies, resulting from his analysis of the *Vymanika Shastra*, developed into his direct field investigation in Pakistan where he was sure to be able to find a connection with the timeless events reported in *Ramayana*. Since this well-known Hindu literary narration mentions the definite destruction of the cities of the Danda Reign between the Vindhya and Saivala Mountains (today's Aravalli and Sulaiman Mountains), he identified the burned ruins of Mohenjo-Daro (formerly in the middle of the Indus River), the mythical city of Lanka (that is, *island* in Sanskrit), destroyed

by a terrible celestial weapon, as narrated in *Ramayana* (Uttara Kanda, Chapter 81). In his book he explains the reasons of his Schliemann-like effort in search of scientific proofs of the evidence of the destructive effects of vimanas, and he documents his findings:

1. The fact that the nature of the ruins of Mohenjo-Daro might be explained as the consequences of a thermic and ballistic wave as well as by an unknown explosion
2. The fact that the fragments of ancient pottery, found in the epicenter of the supposed explosion are *melted*, and their chemical analyses by scientists in Rome showed that they had been exposed to a sudden heat wave (more than 1,500 Celsius degrees).

Of course, this impressive data and these conclusions offer plenty of material for controversy. It is a tragedy that Lord Davenport's sudden death did not permit new investigations on the spot, as well as further studies on the *Vymanika Shastra* material.

In any case, it is easy to dismiss all the vimana descriptions and traditions as mere myth, until one had read them, especially in the case of the *Vymanika Shastra*. In this text—non-literary in nature—the concepts and ideas contained are clearly and completely divergent from their historical context. Ideas such as those expressed in this sort of “technical manual” are certainly not supported by the then prevailing levels of man's understanding of nature and science. This treatise's author is a man attempting to explain an advanced technology, within his limited understanding of science; a technology expressing unexpected differences with our aerospace technology.

The principles which held vimanas aloft had nothing to do with wings and lift. In fact they were sustained entirely by the force they emitted and they were wingless. It is obvious that if the *Vymanika Shastra* had not been composed by ancient Hindu Brahmins, but only at the moment in which it was written (in 1918), the principles expressed therein would not have been too different from today's aeronautical concepts. On the contrary, an advanced but different technology is depicted in *Vymanika Shastra*, as a sort of technical confirmation of Indian literary tradition.

As expressed by Indian researcher Kanishk Nathan in 1987, we must “suggest further examination of this text including having professional engineers and physicists examine the material. The *Vymanika Shastra* allows us to move from the Von Däniken level of work speculation about mythological texts to the more scientific scrutiny of the elaborate models and methods of ancient aeronautics.”

In this light Italy's contribution could also be extremely positive, thanks to Lord Davenport's data and material in our possession. The importance of such studies and investigation is evident and could prove to be shocking for today's man. Because the existence of advanced knowledge and flying devices, beyond mythology, in pre-historic India may be explained not only by a forgotten superior civilization on Earth, but also by possible contact with extra-terrestrial visitors, after all.

In any case science has nothing to lose in this research.

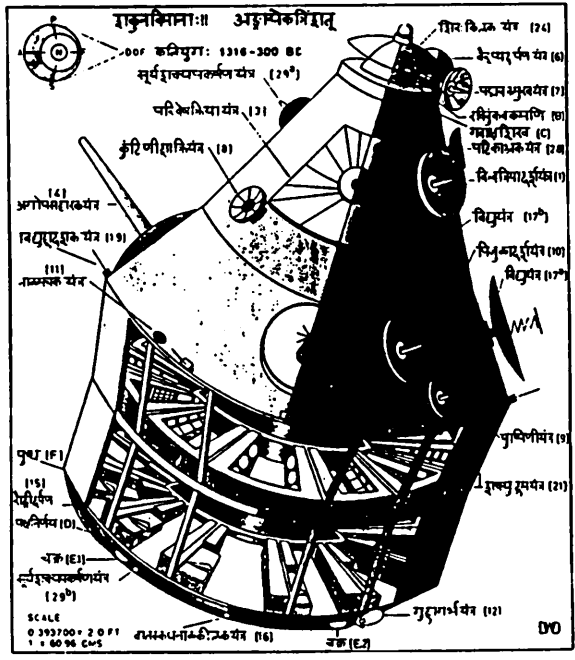


Figure 1 Artist's conception of the Shakuna Vimana (Lord David W. Davenport).

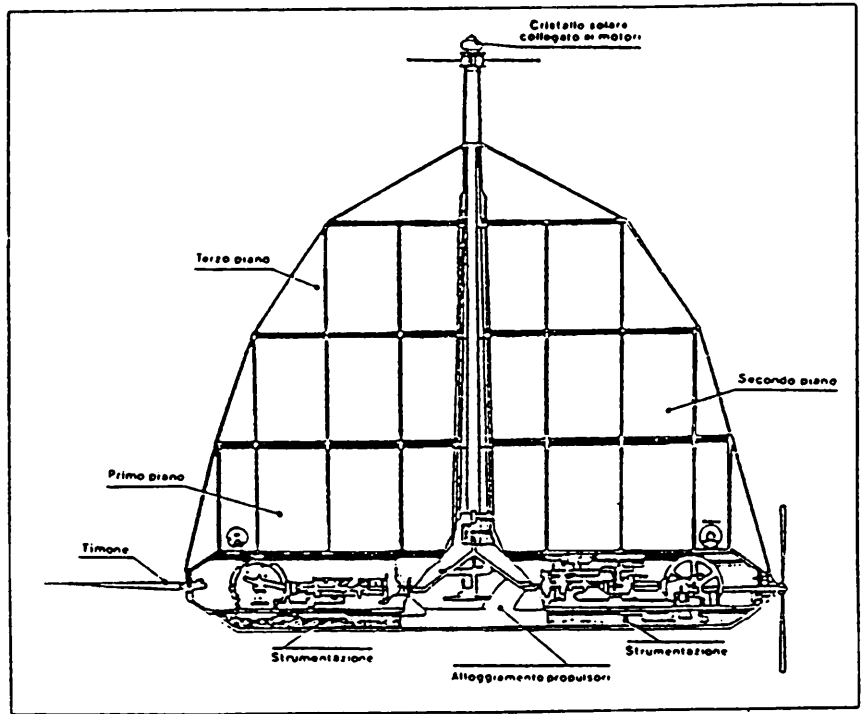


Figure 2 Vertical section of the Shakuna Vimana.

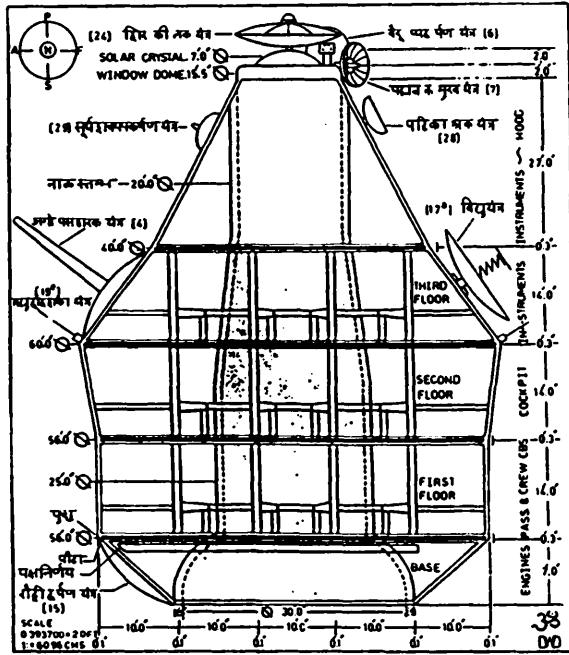


Figure 3 Lord David W. Davenport's graphic interpretation of the Shakuna Vimana (Vertical section).

## Bibliography

- Romesh Dutt (Translator), *Ramayana*, Dent 1950.
- Manatha Nath Dutt, M. A. (Translator), *Ramayana*, Elysium Press (Calcutta) 1891.
- Protap Chandra Roy (Translator), *Mahabharata*, Bharata Press (Calcutta) 1889 (Containing: Drona Parva, Ghatotrachabhadma Parva, Karna Parva, Samsptakabhadha Parva, Vana Parva, Bala Parva).
- Ramachandra Dikshittar, *Warfare in Ancient India*, Macmillan 1952.
- Desmond Leslie & George Adamski, *Flying Saucers Have Landed*, Werner Laurie 1953.
- Erich Von Däniken, *Chariots of the Gods* (Original title: *Erinnerungen an die Zukunft*), Souvenir Press 1969.
- David W. Davenport & Ettore Vincetti, *2000 A.C.: Distruzione Atomica* (2,000 B.C.: Atomic Destruction), Sugarco 1979.
- Kanishk Nathan, *UFOs in India: Ancient and Contemporary*, in *MUFON Symposium Proceedings*, MUFON 1987.
- James Churchward, *The Children of Mu*, Iven Washburn 1931.