

Scientific Discoveries and Inventions by Maharshi Bhardwaj

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1. Maharshi Bhardwaj - Early Life and Education

For development in science and technology, the ancient Indian Literature, especially Vedas, have contributed a lot. Our Vedic Sages were not only Sanyasis but also scientists and engineers in a true sense. Manu Smruti is one of the examples to prove that how our scriptures were modern in terms of knowledge.

स सर्वोऽभिहितो वेदे सर्वज्ञानमयो हि सः । (मनू स्मृती २.७)

It means ‘Sutras of knowledge’, be it is arts or engineering or sciences, are there in our scriptures. According to Vedas, energy is universal and omnipresent and has the power of being transmitted (Yajurveda, 15.33-34).

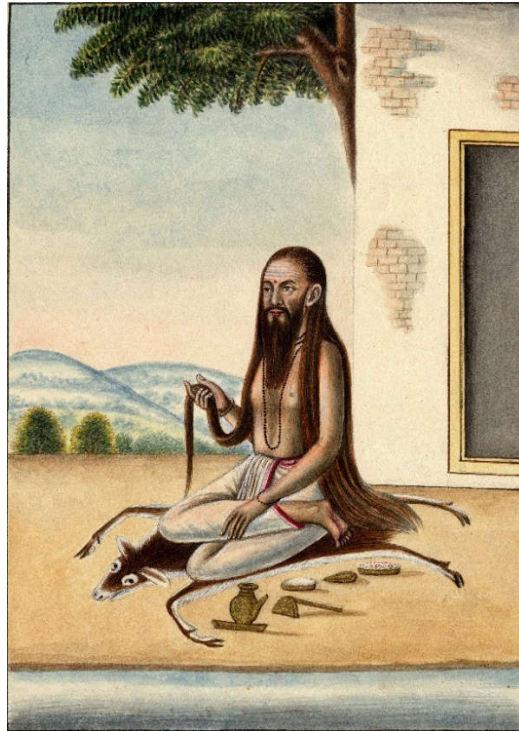


Figure 1. Maharshi Bhardwaj portrait

Among all Vedic sages, Maharshi Bharadwaja is revered as one of the greatest and first scientist of this world and has lived during Vedic Period of 3000 BCE. Bhardwaj's father was Brihaspati, and his mother was Mamata. Devguru Brihaspati had 3 wives, Shubha, Tara and Mamata

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Shubha gave birth to 7 daughters - Bhanumati, Raka, Archishmati, Mahamati, Mahishmati, Sinivali and Havishmati. Tara had 7 sons and 1 daughter. His third wife Mamata had 2 sons named Bhardwaj and Kach. His all the inventions and discoveries have been written by him in his book Amsu Bodhini Shastra (Dadachanji, 1931).

Maharishi Bhardwaj was an expert in mantras, economics, surgery, Ayurveda, etc., a scientist and a mantra seer. Maharishi Bharadwaja has been called the seer of the sixth mandala of the Rigveda. This Mandala contains 765 mantras of Bharadwaja. The Atharva Veda also contains 23 mantras of Bharadwaja. Bharadwaja had received knowledge of grammar from Indra (Praktanra, 1.4) so Maharishi Bhrigu taught him Dharmashastra. According to the Rig Veda, he was the fourth grammarian after Brahma, Brihaspati and Indra.

According to the Charaka Samhita, Bharadwaja received knowledge of Ayurveda from Indra and imparted that knowledge of body therapy to Atrey, Punarvasu and others. Rishi Bhardwaj was one of the oldest sages. Rishi Charaka has described him as having unlimited life span. According to the Valmiki Ramayana, Bhardwaj was a disciple of Maharishi Valmiki. and lived in his ashram. Bhardwaj was with Valmiki when the Konch bird was shot. Rishi Bhardwaj wrote many texts among which Yantra Sarvasva and Vimanashastra are still discussed today. Lord Sri Rama visited his ashram during his exile, which was historically the turning point of Treta to Dwapara. His son Drona was the Guru of Kauravas and Pandavas and was expert in Weaponries.

2. His Scientific Inventions and Discoveries

Maharshi Bhardwaj is the first Scientist of the World. The contribution and achievements of the Maharshi Bhardwaj are described in the texts called "Purana". He was one of the Seven Great Sages or Rishis. His wisdom is recognized up to the present day. In the distant past, in the Mahabharata and Ramayana, aeronautic inventions were used - a domain which was highly advanced at that time. Maharshi Bhardwaj discovered and wrote about the way in which airplanes or spaceships appeared and disappeared and the way in which they traveled from one planet to another (Dadachanji, 1931).

His three inventions are mentioned in Rigveda, Yajurveda and Atharvaveda as follows (Ghai, 2018):

- i) He produced fire by friction. त्वामग्ने पुष्करादध्यथर्वा निरमन्यत । (Yajurveda, 11.32). Upon friction of two stones, fire was be produced (Rigveda, 2.12.3).
- ii) Through friction only, Maharshi Bhardwaj produced Hydroelectric from pond water (Rigveda, 6.16.13) (Yajurveda, 11.32)(Samveda, 9).

- iii) Through excavation from earth and ocean, Maharshi Bhardwaj produced Oil and Natural Gas. (Yajurveda, 11.32, 11.28, 11.29, 11.31)

Books such as Shilpatantra Rahasya, Samarangana Sutradhara, Yantra Sarvaswa, Tantra Pradipika, Yukti Kalpataru etc. contain engineering and technological aspects. In his main contributions, Maharshi Bhardwaj invented Aircrafts, Zinc Distillation, electro-plating and discovered ayurvedic and acupressure techniques and detoxification methods for curing human body from diseases.

3. Aircrafts

A) Historical Context

Maharshi Bharadwaj narrated guidelines to making aeroplanes, in 97 reference books. In Brihad Vimanshastra (vedicvimana, 2023), also called Vymaanika Shastra, maharishi has given 500 guidelines. It is often cited in discussions about ancient Indian technological and scientific achievements.

The text came to public attention in the early 20th century, largely through the efforts of Pandit Subbaraya Shastry, who claimed to have deciphered the manuscript from ancient sources. The references to flying machines, or vimanas, appear in various ancient Indian epics like the Mahabharata and Ramayana, often as divine or mythological vehicles. These references are primarily symbolic, though some interpret them as evidence of advanced ancient technology. It has sparked interest, debate, and controversy, especially in its claims about aviation technology purportedly existing in ancient India. He basically talked about material science, energy sources for propulsion and navigation techniques. Thatte, in his article “Aircrafts in ancient India” mentioned about Vymaanika Shastra of Maharshi Bhardwaj. He also mentioned about Agastya Samhita which is based on Bhardwaj’s Vymaanika Shastra. Maharshi Agastya wrote:

व्योमयानं विमानं स्यादग्रियानं तदेवहि । {अगस्त संहिता}

In *Agastya Samhita*, *Vimanas* have been referred by many different names, it indicates that the planes were common in that period.

लघुयत्सुघटं काष्ठं कोमलं ब्रम्हजाति तद ।
विमानो सर्वदाग्राह्यं लघुत्वादुत्तमं स्मृतं ॥ {अगस्त संहिता}

It means, to construct *Vimanas*, the wood must be lighter in weight, flexible and soft.

कृमीकोषसमुद्भूत कौषेयमिति गद्यते ।
सूक्ष्मासूक्ष्मौ मृदुस्थूलौ ओतप्रोतौ यथाक्रमं ।
वैतानत्व च लघुता च कौषेयस्य गुणसंग्रहः ॥

“Kousheya”, the silk cloth, was broad and very soft.

यवक्षारमयो धानौ सुशुक्तकजलसन्निधौ ।
आच्छदयति तत्तम्रं स्त्रणेनरजते नवा ।
स्वर्णलिप्तं तत्तम्रं शातकुंभमिति स्मृतं ।

In metal salt solution and acidic water, copper can be covered with gold or silver. When a copper is coated with gold, it is ‘*Shat Kumbha*’. This coating using gold or silver is called electroplating.

B) Brihad Vimaan Shastra (Vymaanik Shastra)

The text is divided into sections that describe various aspects of vimanas (flying machines). Key themes include the types of Vimanas, construction details, technological features and safety measures. The text describes several types of vimanas, such as Shakuna, Sundara, Rukma, and Tripura, each with unique designs and functions. These vehicles are said to be capable of flying in different environments (air, water, and even space). Specific metals and alloys, such as "shivaprakash," "sundarakalpaka," and "raukmya," are mentioned for building vimanas whereas descriptions of propulsion systems using solar energy, wind, and other mysterious methods are included. As a technological features, it outlines mechanisms for invisibility, silent operation, and counteracting gravitational forces. Also, advanced aerodynamics and the use of gyroscopic stabilization are mentioned. In terms of safety measures how the natural hazards like lightning and storms can be avoided is also mentioned. It also states about anti-collision measures and protective shielding in details with pilot training and guidelines about the mental and physical fitness of pilots are given. Techniques for navigation and operation are emphasized.

Following figure shows perspective view Shkuna and Tripura Vimana found in Vymaanik Shastra.

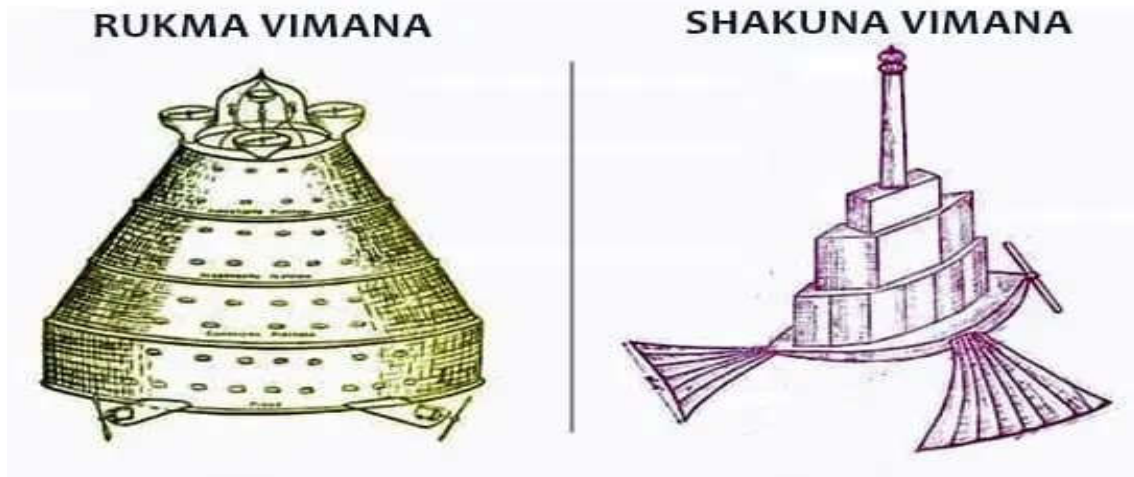


Figure 2. Rukma and Shakuna Vimana

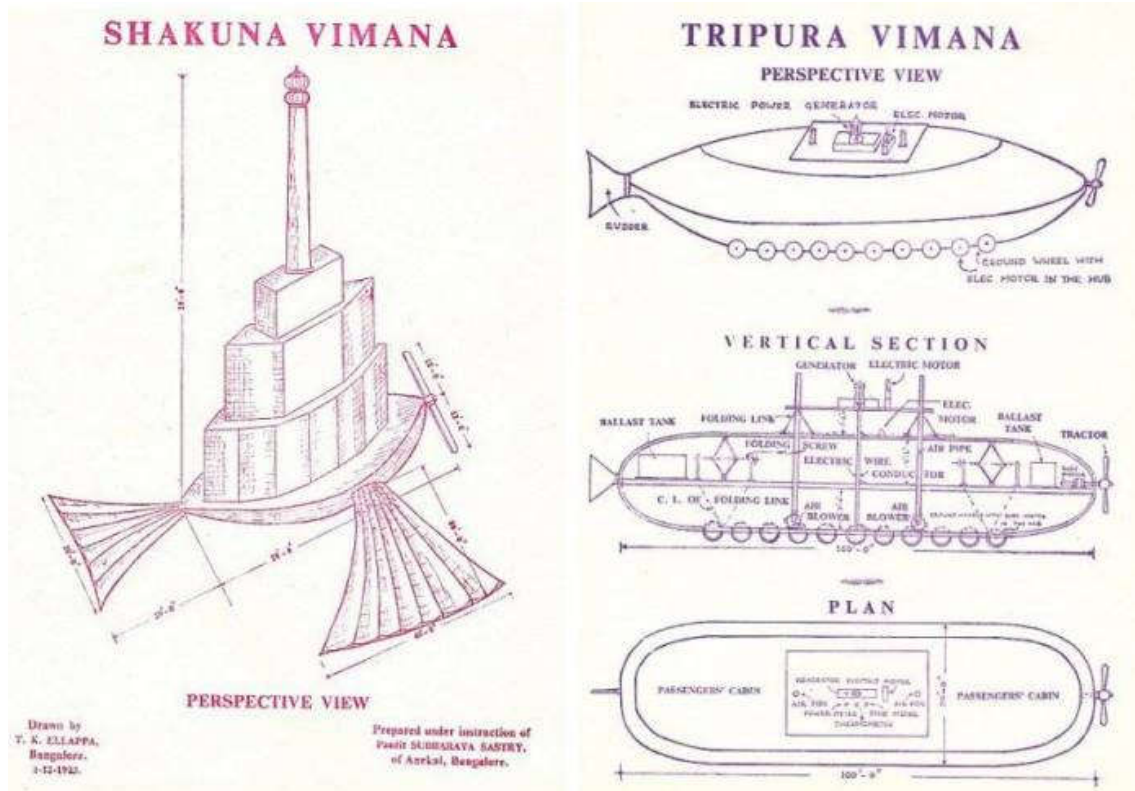


Figure 3. Perspective view of Shakuna and Tripura Vimana

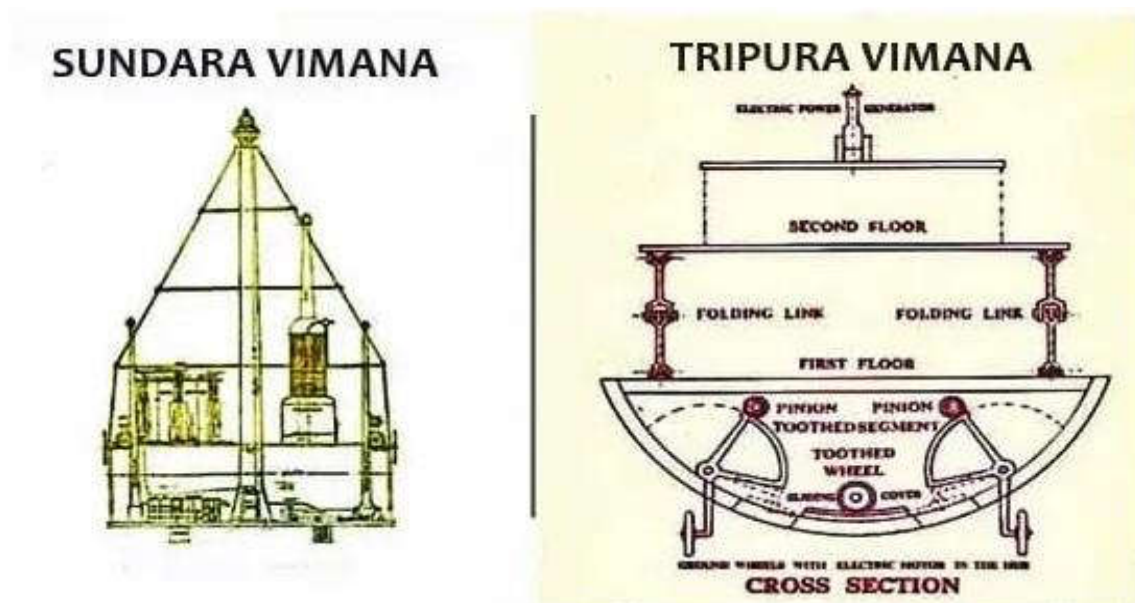


Figure 4. Internal Architecture of Sundara and Tripura Vimana

For scientific interpretation, proponents argue that the Brihad Vimaan Shastra contains evidence of ancient Indian knowledge of aerodynamics, materials science, and propulsion technologies, potentially predating modern aviation. However, scholars skeptical of the text's literal claims suggest that vimanas might be metaphorical representations of spiritual journeys or symbolic vehicles in mythology. Some researchers compare the descriptions in the Brihad

Vimaan Shastra to developments in modern aerospace engineering. However, the lack of physical evidence makes direct comparisons speculative.

C) Criticism and Controversy

Many historians and scholars question the authenticity of the Brihad Vimaan Shastra, as no original manuscripts from antiquity exist. The work surfaced only in the 20th century, casting doubt on its historical veracity. Modern scientists argue that the technical descriptions lack coherence and practical feasibility. Some experiments based on the designs in the text have failed to produce viable flying models. Linguists have pointed out that the language and style of the text resemble medieval or modern Sanskrit rather than ancient Vedic or classical Sanskrit.

D) Impact and Legacy

Despite controversies, the Brihad Vimaan Shastra remains a symbol of India's rich cultural and intellectual history and has inspired works of fiction, films, and speculative research. Engineers, historians, and scholars continue to explore the text, either as a historical curiosity or for potential inspiration. The shastra has fueled discussions on the possibility of lost ancient knowledge and the intersection of mythology and science.

4. Zinc by Distillation Process (Agarwal, 2000)

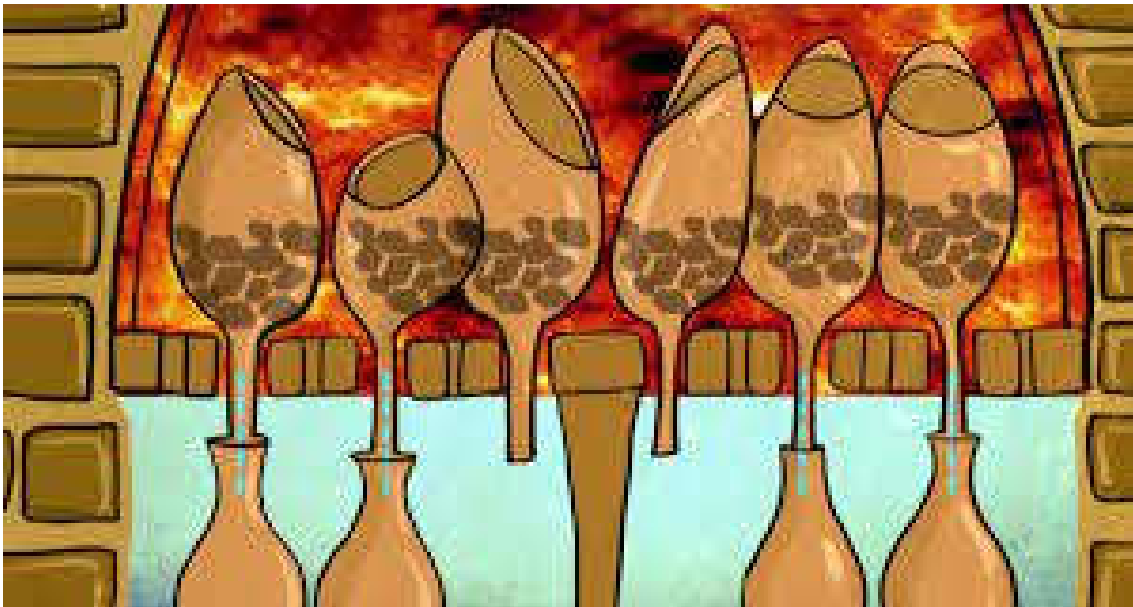


Figure 5. Ancient Zinc smelting furnaces

The next significant Engineering invention by Maharshi Bhardwaj was Zinc distillation process. Zinc was first smelt by India using distillation process. It is a metal which was being used for producing utensils looking like silver and coins like gold. Because zinc boils at around 907°C , it can't be smelt. On the contrary, brass was known from 300 BC in China, but it can

be produced from natural minerals having zinc and copper. However, pure zinc can only be produced by distillation techniques only. The mines of Rajasthan tells that zinc distillation was prevailing in India since 600 BC, however, it was being used only from the 1200 AD, making India, the first producer of zinc. *Anshubodhini* of Maharshi Bhardwaj describes this process of metal separation.

The zinc distillation process is often linked to ancient Indian metallurgical practices, as described in texts like the Brihad Vimaan Shastra or other associated treatises on alchemy and material sciences. While direct references to zinc distillation in Bharadwaj's works are speculative, ancient India indeed had advanced metallurgical knowledge, including techniques to extract and utilize zinc. Below is a detailed explanation of zinc distillation and its potential connection to ancient Indian texts and practices.

A) Historical Context

Zinc is a metal with a relatively high boiling point ($\sim 907^{\circ}\text{C}$) and was historically challenging to extract and purify. Ancient India is credited with pioneering zinc extraction and distillation processes, particularly at the Zawar Mines in Rajasthan, dating back to around the 12th century CE. However, zinc tends to vaporize at high temperatures, making its extraction complex and hence, the ancient process required innovative techniques to capture zinc vapors and condense them into solid metal. Following text describes the ancient Indian process for zinc distillation.

B) Zinc Distillation Process

The process of zinc distillation in ancient India involved the following steps:

1. Raw Material Preparation:
 - Zinc Ore: The primary ore used was sphalerite (zinc sulfide) or smithsonite (zinc carbonate).
 - The ore was crushed and mixed with charcoal, which served as a reducing agent.
2. Furnace Design:
 - The design of the furnace was highly sophisticated. It allowed zinc vapor to be condensed efficiently.
 - The setup involved vertical retorts made of clay or ceramic, which were placed upside down inside the furnace.
3. Reduction and Vaporization:
 - The ore-charcoal mixture was heated in the retorts.
 - At high temperatures, zinc oxide reduced to metallic zinc, which vaporized due to its low boiling point.

4. Condensation:

- The zinc vapor was channeled into a cooling chamber or collected in receptacles where it condensed into solid metal.
- This method ensured minimal loss of zinc and improved purity.

5. Final Collection:

- The solidified zinc was extracted and processed further for use in alloys (e.g., brass) or for other purposes.

C) Scientific and Archaeological Evidence

Maharshi Bharadwaj's texts, particularly the Brihad Vimaan Shastra, include references to materials and metals used in advanced constructions, including flying machines (vimanas). While zinc is not explicitly mentioned, the knowledge of metallurgical processes may have been part of broader ancient Indian material sciences. Ancient Indian alchemical texts, such as the Rasa Shastra, discuss distillation techniques for mercury and other metals. Bharadwaj's works might have contained overlapping knowledge applied to zinc distillation. The techniques attributed to Bharadwaj might have included descriptions of furnace designs, the use of reducing agents, and methods for capturing vapors—principles aligned with the known zinc distillation process in medieval India.

Archaeological excavations at Zawar Mines in Rajasthan revealed evidence of a large-scale zinc distillation process dating to the 12th century CE. The process used at Zawar is consistent with the principles described in ancient Indian metallurgical texts. While no specific references to zinc distillation are found in Bharadwaj's extant works, other texts like the Rasaratna Samuccaya describe similar metallurgical techniques. The process of condensing zinc vapors in sealed chambers reflects an advanced understanding of chemistry and thermodynamics, supporting the idea of systematic metallurgical knowledge in ancient India.

Iron Pillar of Delhi (Wikipedia Contributors, 2020) is the most interesting work in this field is an Iron Pillar of Delhi that does not rust at all. Chandragupta II got it constructed between 375-415 BC which is now in Qutub complex at Mehrauli, Delhi. It was manufactured using forge welding technique for two wrought iron pieces. Scientifically, *“Forge welding is a solid-state welding to join two metal pieces by heating them to a high temperature and then hammering them together”*. Prof. Balasubramaniam, at IIT Kanpur, explains that the pillar's resistance to corrosion is because of passive protective film at the iron-rust interface. This welding process was described in the work and theory given by Maharshi Bhardwaj.



Figure 6. Iron Pillar of Delhi

5. Ayurvedic Acupressure (Agarwal, 2023)

Maharshi Bharadwaj is regarded as one of the pivotal figures in the discovery and development of Ayurveda and Acupressure techniques for healing the human body from diseases. His contributions, as outlined in classical Ayurvedic texts, reflect his role as a transmitter of divine medical knowledge to humanity. Below is an overview of his contributions:

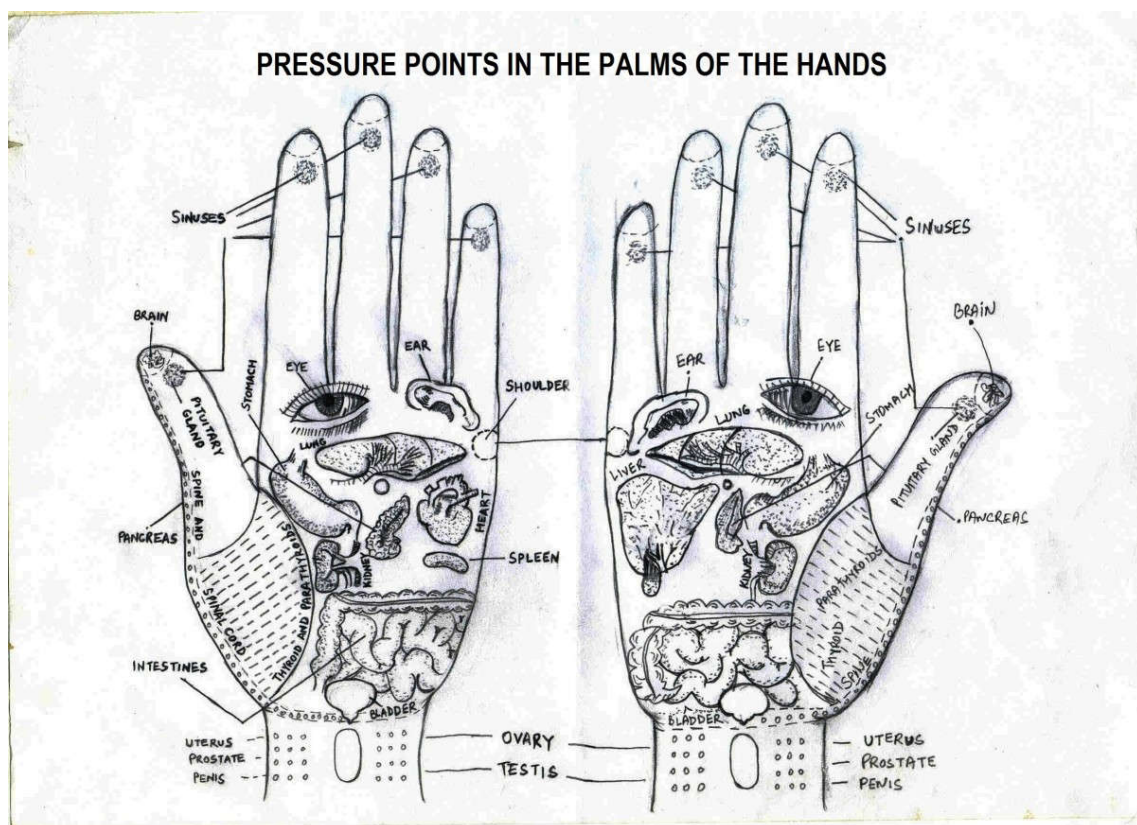
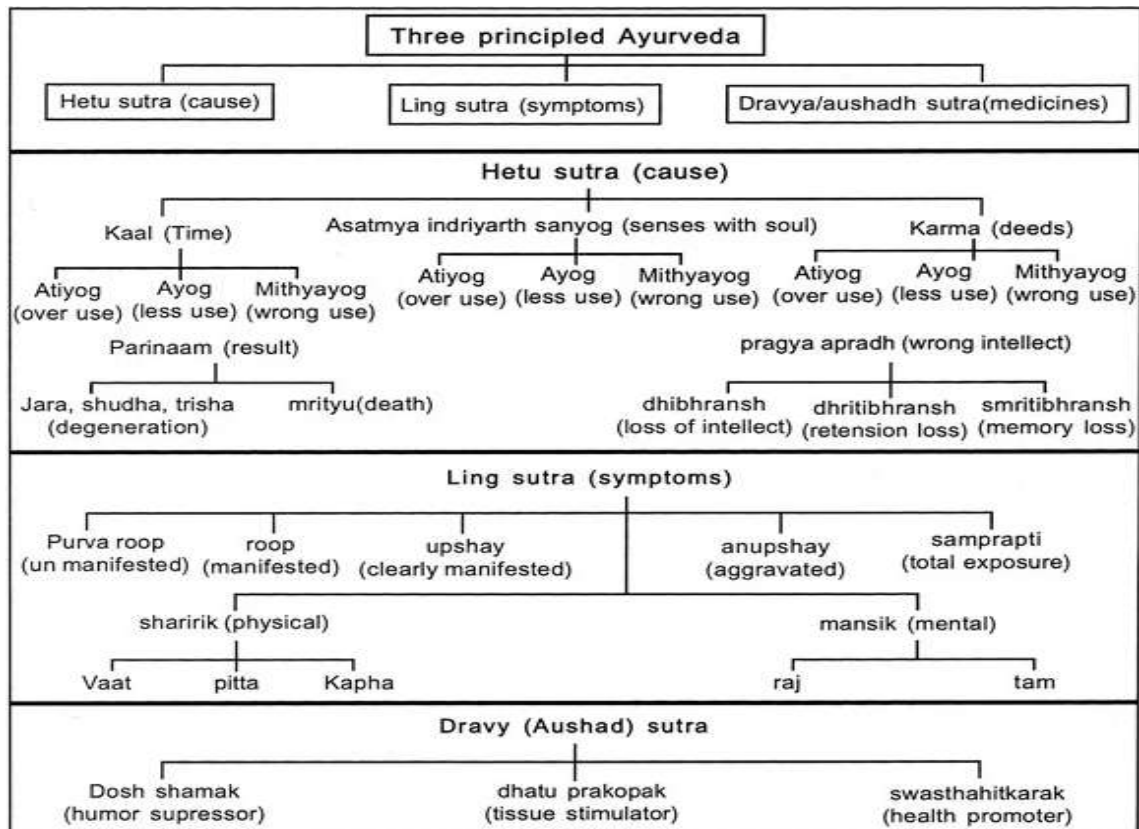


Figure 6. Acupressure points on Palm

Maharshi Bhardwaj wrote this book (Agarwal, 2023) on Ayurvedic Acupressure. It is a confluence of Acupressure and Ayurveda. Acupressure is a simple therapy for treatment and teaches the art of healthy and purposeful living. He mentioned that the creator, God, has created a Self-treating system in human body. It corrects imbalances and relieves disease. Should there be any imbalances at all? So, it gives solutions in the form of points on palm and soles of feet. People call this therapy as Acupressure. The whole system of therapy is based on three principles of Ayurveda shown below.



It is feasible to achieve health, happiness & bliss through the confluence of Acupressure and Ayurveda. According to him, a human being is composed of ten elements: Earth, Water, Fire, Wind, Ether, Time Direction, Mind, Soul, Darkness. The first five (the well-known five elements on which acupressure is based) are physical while the later five are metaphysical. And it is feasible to treat metaphysical elements with the aid of physical elements and vice-versa. With the Ten-Origin concept in Acupressure, simple and incurable diseases can be surprisingly cured. The book-Twist & Joint therapies, treatment of Brain and treatment principles of disorders due to seasonal changes. Diagnosis and treatment protocols of infectious diseases have been enumerated in the book. Protocols of treatment for 42 different diseases have been included in the book.

A) Key Contributions

1. Prevention and Cure:

- Bharadwaj emphasized both preventive and curative aspects of Ayurveda, focusing on the harmony between the body, mind, and environment.
- He highlighted the importance of a healthy lifestyle, diet, and the balance of the three doshas (*Vata, Pitta, Kapha*).

2. Teaching of Panchakarma:

- Bharadwaj is associated with the systematization of Panchakarma, the detoxification and purification techniques central to Ayurveda.

3. Focus on Longevity:

- His teachings include methods to promote longevity (*Rasayana*) and maintain vitality through herbal medicines, dietary guidelines, and mental discipline.

Bharadwaj's teachings on Ayurveda integrate the physical, mental, and spiritual aspects of health, recognizing the individual as a microcosm of the universe. He emphasized living in alignment with nature's cycles to achieve well-being.

B) Legacy and Influence

The Charaka Samhita, attributed to Sage Charaka, acknowledges Bharadwaj as one of the primary transmitters of Ayurvedic knowledge. Many principles in the text trace their origin to Bharadwaj's teachings. His knowledge formed the basis for the development of subsequent Ayurvedic literature, including the works of Charaka and Sushruta. Bharadwaj's holistic vision continues to inspire Ayurvedic practitioners, emphasizing a balance between science and spirituality in healthcare.

6. Dhanurveda

The Dhanurveda (Johnson, 2009) is an ancient Indian treatise on the art of warfare and archery. It is considered an Upaveda (secondary Veda) of the Yajurveda, dealing with military science, martial arts, weaponry, and tactics. Below is a brief overview of the Dhanurveda:

A) Origins and Historical Context

The term "Dhanurveda" is derived from *Dhanus* (bow) and *Veda* (knowledge), signifying the knowledge of archery and martial skills. Traditionally attributed to sage Vishvamitra or sage Bharadwaj, it is a compilation of knowledge passed down through oral traditions and written texts. The origins of Dhanurveda are ancient, with references in the Rigveda and Mahabharata. Its structured form is believed to have developed around 500 BCE to 500 CE.

The Dhanurveda covers various aspects of warfare and martial arts, including:

1. Types of Weapons:

- Muktayudha: Projectile weapons (e.g., bow and arrow, spears).
- Amuktayudha: Melee weapons (e.g., swords, maces).
- Yantramukta: Mechanical weapons (e.g., catapults).
- Mantramukta: Weapons powered by mystical incantations (e.g., divine astras).

2. Training in Martial Arts:

- Physical fitness, agility, and strength.
- Techniques for hand-to-hand combat (*malla-yuddha*) and use of weapons.

3. Strategies and Tactics:

- Battlefield formations (*vyuhas*), espionage, and psychological warfare.
- Defensive and offensive maneuvers.

4. Disciplines Covered:

- Archery as the core skill.
- Use of chariots, elephants, cavalry, and infantry.
- Training in swimming, climbing, and surviving under harsh conditions.

5. Moral and Ethical Guidelines:

- Emphasis on the ethical use of weapons and dharma in warfare.
- Prohibitions on harming unarmed individuals, civilians, and non-combatants.

B) Legacy and Influence

The Dhanurveda was a manual for Kshatriyas (warrior class), guiding their training and conduct in battle. It influenced military training academies (*gurukuls*) and was an integral part of education for warriors like Arjuna in the Mahabharata. Many martial art traditions in India, such as Kalaripayattu (Kerala) and Silambam (Tamil Nadu), trace their origins to the principles of Dhanurveda. The text highlights the scientific and systematic approach to warfare in ancient India, blending physical, mental, and spiritual preparation.

7. Śrauta Sūtra

The Śrauta Sūtras (Johnson, 2009) are a significant category of Vedic literature, forming part of the Kalpa Sūtras, which are manuals dealing with the performance of Vedic rituals. The term "Śrauta" is derived from "Śruti" (that which is heard), signifying that these texts are based on the Śruti (the Vedas). The Śrauta Sūtras are prescriptive texts that describe the performance of Śrauta rituals, which are solemn Vedic sacrifices performed using three or more sacred fires (Agni). Each Śrauta Sūtra is associated with one of the four Vedas (*Rigveda*, *Yajurveda*, *Samaveda*, or *Atharvaveda*), providing instructions for rituals mentioned in the respective

Veda. These texts primarily guide the performance of public and grand sacrifices (*yajnas*), which often involve multiple priests and elaborate ceremonies.

A) Content and Structure

The Śrauta Sūtras typically include:

1. Types of Rituals:
 - Daily Sacrifices (Nitya): Such as *Agnihotra*.
 - Occasional Sacrifices (Kamya): Performed for specific desires, e.g., wealth, progeny.
 - Grand Sacrifices (Mahāyajñas): Include *Rajasuya* (royal consecration), *Ashvamedha* (horse sacrifice), and *Somayajna* (soma offering).
2. Detailed Instructions:
 - Procedure for building sacrificial altars (*yajna-vedi*).
 - Preparation of sacrificial implements and offerings.
 - Role of priests and division of responsibilities (e.g., Hotri, Adhvaryu, Udgatri).
3. Philosophical and Symbolic Aspects:
 - Explanation of the symbolic significance of rituals.
 - Connections between sacrifices and cosmic harmony.

B) Major Śrauta Sūtras

Different Śrauta Sūtras are associated with specific Vedic schools (*Shakhas*). Some prominent ones include:

- Rigveda: Āśvalāyana Śrauta Sūtra, Śāṅkhāyana Śrauta Sūtra.
- Yajurveda: Kātyāyana Śrauta Sūtra, Baudhāyana Śrauta Sūtra, Āpastamba Śrauta Sūtra.
- Samaveda: Drahyāyana Śrauta Sūtra, Jaiminiya Śrauta Sūtra.
- Atharvaveda: Vaitāna Śrauta Sūtra.

C) Significance

1. Preservation of Vedic Rituals:
 - The Śrauta Sūtras are crucial for understanding and preserving the intricate details of Vedic yajnas.
2. Cultural and Historical Value:
 - These texts provide insights into the religious, social, and cultural life of ancient India.
3. Foundation for Later Texts:

- They influenced the development of later ritualistic and philosophical texts, including the Grihya Sūtras (household rituals) and Dharma Sūtras (legal and moral codes).

8. Bharadwaj Shiksha

The Bharadwaj Shiksha refers to a treatise or teachings attributed to the sage Maharshi Bharadwaj that focus on the science of phonetics and pronunciation, as part of the broader Shiksha discipline in Vedic literature. Shiksha is one of the six Vedangas (auxiliary sciences) designed to aid in the correct study and understanding of the Vedas. Shiksha deals with the proper pronunciation, intonation, and articulation of Vedic mantras to preserve their sanctity and effectiveness. Ensures that the oral transmission of the Vedas remains accurate, maintaining their phonetic and spiritual integrity.

A) Contribution to Shiksha

1. Focus Areas:

- Correct pronunciation of vowels (*svara*) and consonants (*vyanjana*).
- Rules for intonation (*svaras*), including *udatta* (raised), *anudatta* (lowered), and *svarita* (neutral).
- The phonetic aspects of chanting Vedic hymns.

2. Methods and Techniques:

- Detailed guidance on articulation using the vocal organs.
- Emphasis on the rhythm, meter (*chandas*), and syllabic precision.

3. Preservation of Vedic Knowledge:

- Bharadwaj Shiksha was crucial for maintaining the oral tradition of the Vedas, which relied heavily on precise recitation.

B) Significance

1. Phonetic Accuracy:

- Correct pronunciation ensures that the spiritual and ritual efficacy of Vedic mantras remains intact.

2. Role in Education:

- Forms a foundational aspect of Vedic education for priests and scholars.

3. Linguistic Contribution:

- Contributed to the development of Sanskrit phonetics and grammar.

9. Niti Shastra

Maharshi Bharadwaj made significant contributions to Niti Shastra (the science of ethics, governance, and conduct). Although specific standalone texts on Niti Shastra attributed solely to Bharadwaj are rare, his teachings and principles are often referenced in ancient Indian literature, where he is regarded as a wise advisor and an authority on ethical and moral conduct.

Below is an overview of his contributions:

A) Contributions to Niti Shastra

1. Ethics and Morality

- Bharadwaj emphasized the principles of Dharma (righteousness) and Satya (truth) as the foundation for individual and societal conduct.
- His teachings underline the importance of adhering to moral virtues such as honesty, compassion, and self-discipline in both personal and public life.

2. Governance and Leadership

- He provided guidance on the qualities of an ideal ruler, emphasizing the need for justice, impartiality, and a commitment to the welfare of the people.
- Bharadwaj highlighted the importance of balancing power with responsibility and advised rulers to avoid tyranny, greed, and favoritism.

3. Social Harmony

- He stressed the necessity of maintaining harmony among different sections of society by respecting diversity and ensuring fairness in the distribution of resources and opportunities.
- His teachings advocated for a society built on mutual respect, cooperation, and adherence to ethical principles.

4. Education and Knowledge

- Bharadwaj valued education as a key to ethical living and governance. He emphasized the need for leaders to be well-versed in multiple disciplines, including philosophy, warfare, and statecraft.

His teachings on Niti Shastra reflect a holistic approach, integrating:

- Dharma (moral duty): Guiding actions in alignment with universal laws.
- Artha (material prosperity): Managing resources ethically.
- Kama (desires): Fulfilling desires within moral boundaries.
- Moksha (liberation): Striving for spiritual elevation alongside worldly duties.

B) Legacy and Influence

Bharadwaj's teachings on Niti Shastra influenced later works on statecraft, ethics, and governance, such as Chanakya's Arthashastra and the Manusmriti. His principles are often

quoted in discussions of righteous leadership and social ethics. His contributions were integral to the development of the Rajadharma (duties of kings) and Samajika Dharma (duties within society), forming the ethical backbone of Vedic society. Bharadvaj's focus on justice, truth, and compassion remains relevant in contemporary discussions on leadership and governance.

10. Other Literary References about Maharshi Bhardwaj

Bharadvaja is a revered sage in the Hindu traditions, and like other revered sages, numerous treatises composed in the ancient and medieval eras are reverentially named after him. Some treatises named after him or attributed to him include:

- i) *Dhanur-veda*, credited to Bharadvaja in chapter 12.203 of the *Mahabharata*, is an Upaveda treatise on archery. (Holdrege, 2012) (Jhonson, 2009)
- ii) *Bharadvaja samhita*, a Pancharatra text (an Agama text of Vaishnavism). (Dasgupta, 1940)
- iii) *Bharadvaja srautasutra and grhyasutra*, a ritual and rites of passage text from first millennium BCE. (Thaneswar, 1991) (Bowles, 2007) (Keith, 1914) After the *Kalpasutra* by Baudhayana, these Bharadvaja texts are among the oldest *srauta* and *grhya* sutras known. (Moriz, 1996)
- iv) Sections in *Ayurveda*. Bharadvaja theories on medicine and causal phenomenon is described in *Charaka Samhita*. Bharadvaja states, for example, that an embryo is not caused by wish, prayers, urging of mind or mystical causes, but it is produced from the union of a man's sperm and menstrual blood of a woman at the right time of her menstrual cycle, in her womb. (Wujastyk, 2003) (Gerrit, 1999) According to Gerrit Jan Meulenbeld, Bharadvaja is credited with many theories and practical ideas in ancient Indian medicine. (Gerrit, 1999)
- v) *Niti sastra*, a treatise on ethics and practical conduct. (Gerrit, 1999)
- vi) *Bharadvaja-siksa*, is one of many ancient Sanskrit treatises on phonetics. (Johnson, 2009)

11. Acclaim and Criticism

Maharshi Bhardwaj's contributions have not been without scepticism. Critics argue that the technological descriptions in the Brihad Vimaanshastra and other techniques are more mythological than scientific. However, many scholars have acclaimed the and been using the acupressure and ayurveda techniques he discovered. Scientists do not deny of metallurgy processed given by Maharshi Bhardwaj. His texts remain invaluable for their philosophical depth and visionary outlook.

12. Conclusion

The Ancient Indian Texts shows how brilliant our ancestors were in terms of technologies before we entered the Macaulay Education System. The traditional Gurukul method of Education was to enhance the learning to make best engineers and a responsible citizen too. The scriptures contain treasure of knowledge which was kept hidden, and now, it is our responsibility spread it to everyone so that the people can realize how great the Bharat was.

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