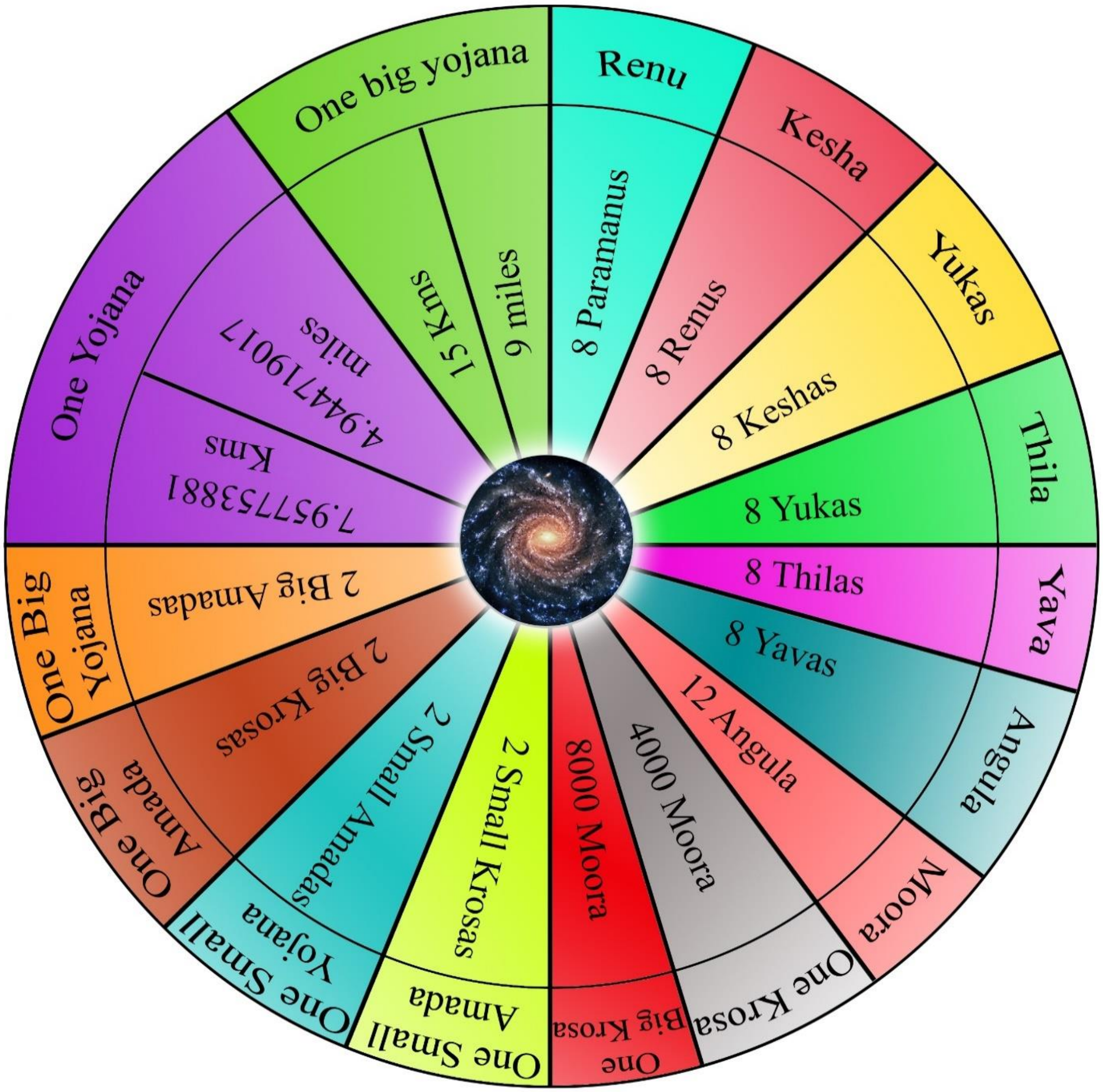
THE YOJANA THEORY

VEDIC UNIT OF MEASURING DISTANCE



i. RESEARCH PAPER/ THESIS/ DISSERTATION ON ASPECTS OF THE YOJANA THEORY

(VEDIC UNIT OF MEASURING DISTANCE)

BY
Muthyala Ramakrishna Rao

A Research Paper/Thesis/Dissertation
Submitted Partial Fulfillment of the Requirement for the
Doctorate of Philosophy

Department of Geography
in the University of Leeds U.K
2019

(Please replace Name and Year with your information and delete all instruction)

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ii. RESEARCH PAPERS/THESIS/ DISSERTATION APPROVAL

THE YOJANA THEORY (VEDIC UNIT OF MESURING DISTANCE)

BY
Muthyala Ramakrishna Rao

A Thesis/ Dissertation Submitted in Partial
Fulfillment of the Requirements
for the Degree of Doctorate of Philosophy

Doctorate of Philosophy History

Approved by
(Name of thesis/dissertation chair), Chair

(Name of committee member 1)

(Name of committee member 2)

(Name of committee member 3)

(Name of Committee member 4)

Sri Venkateshwara University

(Date of Approval)

iii. AN ABSTRACT OF THE DISSERTATION OF

Muthyala Ramakrishna Rao Student, for the Doctor of Philosophy degree in Major field, presented on dated of Defense at University of Leeds.

TITLE: A Research papers on The Yojana Theory (Vedic Unit of Measuring of Distance)

Major Professor:

iv. DEDICATION

(No required for Research paper)

The Lord Sri Rama

(The dedication, as the name suggests is a personal dedication of one's work)

v. ACKNOWLEDGEMENTS

(Not required in Research paper)

I would like to thanks Dr.-- for his invaluable assistance and insights leading to the write of this papers. My sincere thanks also go to the ------members of my graduate committee for their patience and understanding during the 11 years of effort that went into the production of this papers.

A special thanks also Author of Geography of Ramayana from whose many f the examples used in this sample research paper have been quoted. Another special thanks to Prof-------------------------------------who provided the previous thesis template upon which much of this is based and for help with graphics packages.

Introduction of Geography of Ramayana:

Geographical picture of Ramayana. The geographical details of Ramayana are explained in the *Kishkinda Kanda*. these had been discussed in Ramayana before the modern Scientifics explained them. *Bharatha's* life in *Ayodhya,* the things in Mithila, the life in *Kishkinda* and Rama's stay in the forest are all described in different cantos. All four corns of the globe are described by Valmiki. So, this book is named" Geography of Ramayana.

Our *Bharatha* Varsha was ruled by many emperors and people were happy in their rule. But some others created a rift among Indians. Some others immigrated to our country and ruled it. They robbed our wealth; they also took away our holy books and other important literature. There is an example. In a village, there lived a rich man. He possessed unlimited financial and agricultural wealth .one day a thief broke into his house. He did not take away his money or grains. He simply took away the family history and other documents relating to distance story, when the rich man woke up found that no money or grains had been stolen and only the documents had been taken away. After some time, he came and said that the house belonged to him as he was a member of that family. In spite of his wails, the rich man was not heard by anybody. He could not show any papers in support of his connection with the family. So, the villages declared the stronger to be the successor and handed over the house and the property to him. The rich man and his family were on the road. The message of the story is that books and papers are more valuable them wealth. Similarly, foreigners looted our holy books. They studied them deeply and discovered new things, with the help of them they developed their country and we remained silent spectators to their development. So, our ancient books are important to us. Therefore, we should protect them. Had those books been there with us our countrywide have remained "Rama Rajya"

"inquiry, knowledge acquired by investigation" is the study of the past, particularly how it relates to humans. It is an umbrella term that relates to past events as well as the memory, discovery, collection, organization, presentation, and interpretation of information about these events. Scholars who write about history are called historians. Events occurring before written record are considered prehistory.

History can also refer to the academic discipline which uses a narrative to examine and analyses a sequence of past events, and objectively determine the patterns of cause and effect that determine them. Historians sometimes debate the nature of history and its usefulness by discussing the study of the discipline as an end in itself and as a way of providing "perspective" on the problems of the present.

All history is contemporary history". History is facilitated by the formation of a 'true discourse of past' through the production of narrative and analysis of past events relating to the human race. The modern discipline of history is dedicated to the institutional production of this discourse.

All events that are remembered and preserved in some authentic form constitute the historical record.[18] The task of historical discourse is to identify the sources which can most usefully contribute to the production of accurate accounts of the past. Therefore, the constitution of the historian's archive is a result of circumscribing a more general archive by invalidating the usage of certain texts and documents (by falsifying their claims to represent the 'true past')
The line of demarcation between prehistoric and historical times is crossed when people cease to live only in the present and become consciously interested both in their past and in their future. History begins with the handing down of tradition, and tradition means the carrying of the habits and lessons of the past into the future. Records of the past begin to be kept for the benefit of future generations.

Historiography has a number of related meanings. Firstly, it can refer to how history has been produced: the story of the development of methodology and practices (for example, the move from short-term biographical narrative towards long-term thematic analysis). Secondly, it can refer to what has been produced: a specific body of historical writing (for example, "medieval historiography during the 1960s" means "Works of medieval history written during the 1960s"). Thirdly, it may refer to why history is produced: the Philosophy of history. As a meta-level analysis of descriptions of the past, this third conception can relate to the first two in that the analysis usually focuses on the narratives, interpretations, worldview, use of evidence, or method of presentation of other historians. Professional historians also debate the question of whether history can be taught as a single coherent narrative or a series of competing narratives.

Kings-Kingdoms-Administration-Tenure
In the ancient day’s sages named the kings on the basis of their facial and physical features or their birth stars and planets. In some cases, the kings were named on the basis of the names of the kingdoms, their geographical features or the directions.

In the ancient days, the number of towns and villages was a loss. As against 10 villages today, there was one village then similarly the distance between one village and the other was very much. The king ruled the kingdom in accordance with his whims and families, whatever may be his style of administration, people used to be tolerant. They kept silent as they were unable to oppose the king. When the rule was not proper, other kings attacked the kingdom and occupied it.

In the ancient time's rivers, mountains and pilgrim centers used to be boundaries of the kingdoms. The people in their days were healthy and had good longevity. the reasons were climate, food habits, bodily lab our, tranquility, devotion to God, entertainments, etc. The people also worshipped nature. The tamas nature (self-shish or vindictive). The kings lived their people some way they loved their families.

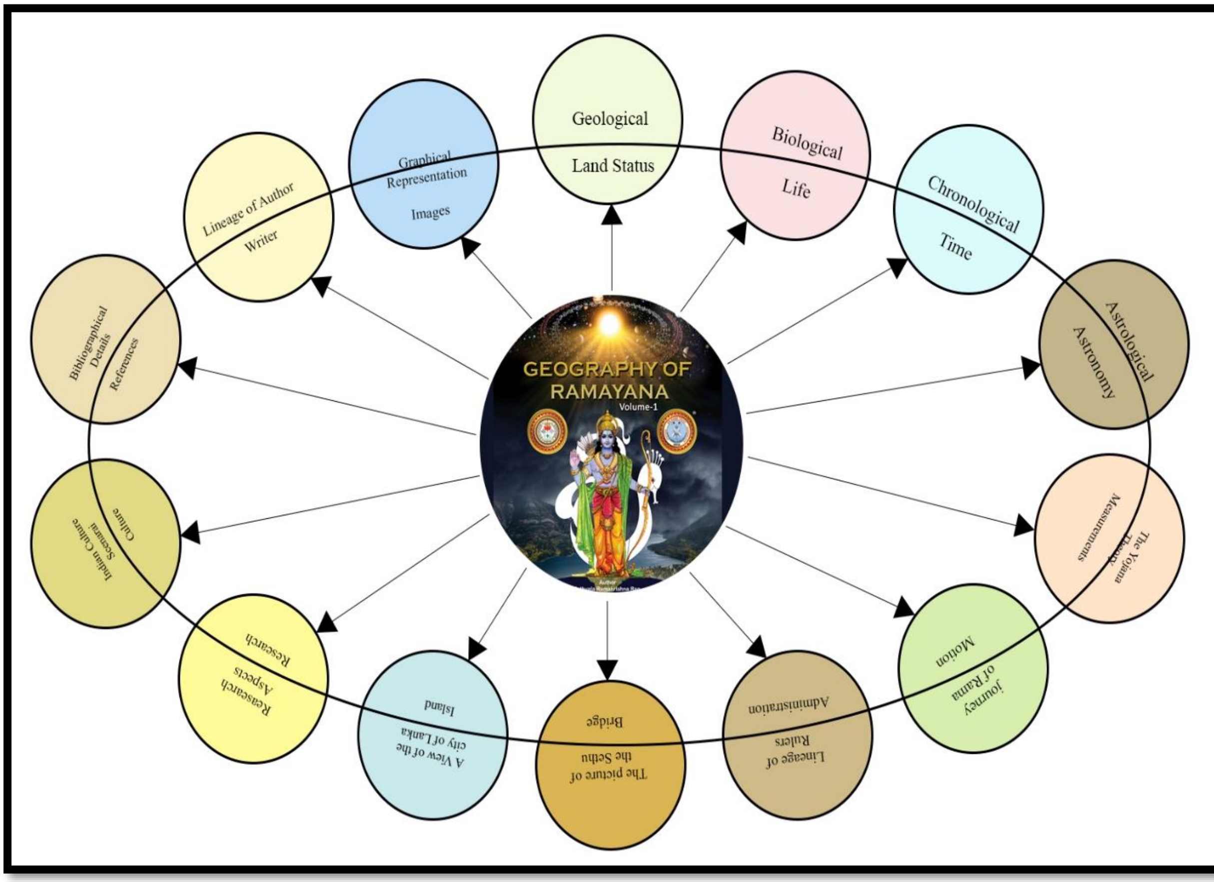
Peoples in the villages spent their time by undertaking one craft or the other. The laborer’s, as well as the people, lived peacefully without having any unnecessary thoughts.it the people had any problems the village elders, solved them. If they were beyond their capacity, they informed the kings of them through spies. If a particular issue was given the solution by the king, it was deemed final and everybody had to be bound by it and they had no chance to address it to any other agency. Un account of these things, problems did not appear to be grave for the people.

Certain kings used to trouble the people an account of their evil thoughts. drinking, womanizing, lack of sense of Justice, absence of interest in the administration, desire to annex other kingdoms, leak of harmony with ministers, revolt from the people, laying an unjust burden on people, etc. lead to the decline of the kingdom and the kings. There was also a possibility of other kings occupying the kingdom resulting in these irresponsible kings remaining villains in the annals of history.

In every village people of each caste do the work related to it. A family in a village depends on different castes. To make a plow to be used by an agricultural family, a carpenter was needed and the stick of the plow had to be made by a blacksmith similarly a putter was needed to make pots, a wearer to wearer clothes, a goldsmith to make jewels, a cobbler to stitch chappals, a bamboo craftsman to Kruta tubs, a barber to shave hair, a quarryman to break stones, a today tapper to extract today, amortize to wearer blankets, a herald to announce the Sunrise, a teacher to educate people, physicians cure diseases and a Brahma in to perform rituals in a temple. Since every person got some work to earn a living, there was no fear of thieves in the ancient days, in case a thief was caught, there was severe punishment for him. The king treated all people equally. The ancient villages were equal in size to ten villages today.

Once a week there was a market. On that day, the villages came to the market and purchased things sufficient for a week. In the same place, there was a market for cattle also. Without being told the king to provide all the facilities required for the people. They spent time in preserving their plant wealth.

Geography of Ramayana comprises 14 sections



1.Geological condition: Man, enters the lap of the earth the moment he gets out form his mother's womb. The earth remains his shelter as long as he lives. God has arranged for his sustenance even before he is born. So, the geographical condition is considered the first stage in man's odyssey.

2. Biological condition: The earth is the base for man to make steady growth. There are 84 million species of animals on the earth as per Vedas as well as science. Some animals have become extinct both on account of the vagaries of nature, and changes in the geological conditions. Certain animals are seen through the microscope and some not visible even through the microscope. A man takes birth and receives fruits of the deeds of his previous births. This is known as “The Law of Karma “. Also, the creation of the universe by Brahma is sufficiently dealt with. The biological condition regarded the second state as man's stay changes from his mother's womb to the earth.

3. Chronological condition: It is related to both the above conditions. Time is a measuring rod to record the changes on the earth and the development of man. The wheel of time rotates eternally, all the incarnations, the time of Brahma (The Creation) and the age of mankind spreading across the enormous gamut of time. Time is a base for geological as well as biological transformation. So, it is termed the third condition.

4. Astrological picture: It is related to time. The position of the planets, stars and their movements with the passage of times brings about changes in human beings, as well as on the earth. So, changes in time can be known on the basis of the movement of the stars and the planets. Therefore, the astrological condition is dealt with in the fourth chapter after that dealing with time.

5. The Yojana theory (Vedic unit of measuring distance): The distance between the earth and heavenly bodies (Planets and stars) and distance of them from the earth on account of their movement was measured in times of "Yojanas" in the ancient times. Accordingly, in the Ramayana also distance was measured by Yojanas. Later the conversion of yojanas into miles came to be made.

6. The journey of Rama: This is linked to all the preceding five aspects. Having been born on the earth, Sri Rama walked on foot across the length and breadth of the country (India) and the distance covered by Him has been measured by Yojanas. So, this chapter becomes the eighth one in the book. Figure-1 Journey of Lord Sri Rama walking from *Ayodhya* to Indian southern tip, Southern tip (Kanyakumari) is the point constriction of Sethu (the bridge) to take place.

7. The lineage of Rulers: The chapter gives an account of the names of the kings of the Surya and Chandra dynasties and their respective tenures. Fittingly it is included in the seventh section.

8. The picture of the Sethu, *Varadhi* (the great bridge): This part gives an insight into the way Rama undertook a hectic journey on foot to the Southern tip of the country and the way he got the endless bridge (*The great Sethu or Varadhi)* constructed across the Southern Ocean to reach the city of Lanka. The great Sethu was constructed with trees and rocks. This consists of nature's bounty. The length and width of the bridge were calculated in yojana units in the Ramayana. So, the chapter becomes eighth in the order.

9. A view of the city of Lanka: This chapter is a sequel to the preceding three chapters. In this book "Geography of Ramayana "(*Sri Ramabdhi Shuktimani*) the 8th, 9th chapters assume a lot of importance. The city of Lanka underwent a transformation from its geological condition on account of the movement of earth. The way it lost its original state and assumed a new state is explained from the angle of modern Science.

10. Research aspect: All the things discussed including different conditions and their changes are explained from the point of view of the legend as well as modern Science in this section. The situation regarding the great Sethu, the city of Lanka and the *Simhala* Island along with changes in nature are elaborated in the section which logically occupies the tenth place in the order.

11. Indian cultural Scenario: The part explains how our people even today are following such ancient Indian culture as seen in our mythologies and legends. Even the historians of other countries have written books glorifying our culture. So, it is included in the eleventh section.

12. Bibliographical details: The section provides information regarding the books in English and Telugu from which data has been collected for writing the book. So, it occupies the 12th place in the sequence.

13. Lineage of the author: This chapter givens an account of the heredity of the author who has undertaken the uphill task of writing a research-oriented book based on Ramayana with an aim of showing the authentic picture of the great Sethu or *Varadhi* (the great bridge), *Lankanagara*, *Simhala*, island, etc. by patiently and perseveringly gathering information from various sources, mythological legendary and Scientific. So naturally, it has become the penultimate section.

14. Graphic representation: This section gives a pictorial description of certain important things mentioned in chapters 1 to 11. The last section, therefore, appears to be the fitting conclusion of the treatise.

vi. PREFACE

(Do not use in Research papers)

A preface or foreword may contain the Author's statement of the purpose of the study or special notes to the reader.

GEOGRAPHY OF RAMAYANA

Introduction to Geography:

The main objective of this online textbook is to introduce students to the exciting field of knowledge known as physical geography. Physical geography is a discipline that is part of a much larger area of understanding called geography. Most individuals define geography as a field of study that deals with maps. This definition is only partially correct. A better definition of geography may be the study of natural and human-constructed phenomena relative to a spatial dimension.

The discipline of geography has a history that stretches over many centuries. Over this time period, the study of geography has evolved and developed into an important form of human scholarship. Examining the historical evolution of geography as a discipline provides some important insights concerning its character and methodology. These insights are also helpful in gaining a better understanding of the nature of physical geography.

History of Geography and Physical Geography

Some of the first truly geographical studies occurred more than four thousand years ago. The main purpose of these early investigations was to map features and places observed as explorers traveled to new lands. At this time, Chinese, Egyptian, and Phoenician civilizations were beginning to explore the places and spaces within and outside their homelands. The earliest evidence of such explorations comes from the archaeological discovery of a Babylonian clay tablet map that dates back to 2300 BC.

The early Greeks were the first civilization to practice a form of geography that was more than mere map-making or cartography. Greek philosophers and scientist were also interested in learning about spatial nature of human and physical features found on the Earth. One of the first Greek geographers was Herodotus (circa 484 - 425 BC). Herodotus wrote a number of volumes that described the human and physical geography of the various regions of the Persian Empire.

The ancient Greeks were also interested in the form, size, and geometry of the Earth. Aristotle (circa 384 - 322 BC) hypothesized and scientifically demonstrated that the Earth had a spherical shape. Evidence for this idea came from observations of lunar eclipses. Lunar eclipses occur when the Earth casts its circular shadow on to the moon's surface. The first individual to accurately calculate the circumference of the Earth was the Greek geographer Eratosthenes (circa 276 - 194 BC). Eratosthenes calculated the equatorial circumference to be 40,233 kilometers using simple geometric relationships. This primitive calculation was unusually accurate. Measurements of the Earth using modern satellite technology have computed the circumference to be 40,072 kilometers.

Most of the Greek accomplishments in geography were passed on to the Romans. Roman military commanders and administrators used this information to guide the expansion of their Empire. The Romans also made several important additions to geographical knowledge. Strabo (circa 64 BC - 20 AD) wrote a 17-volume series called "Geographic". Strabo claimed to have traveled widely and recorded what he had seen and experienced from a geographical perspective. In his series of books, Strabo describes the cultural geographies of the various societies of people found from Britain to as far east as India and south to Ethiopia and as far north as Iceland. Strabo also suggested a definition of geography that is quite complementary to the way many human geographers define their discipline today. This definition suggests that the aim of geography was to "describe the known parts of the inhabited world ... to write the assessment of the countries of the world [and] to treat the differences between countries".

During the second century AD, Ptolemy (circa 100 - 178 AD) made a number of important contributions to geography. Ptolemy's publication Geographic hyphens are or "Guide to Geography" compiled and summarize much of the Greek and Roman geographic information accumulated at that time. Some of his other important contributions include the creation of three different methods for projecting the Earth's surface on a map, the calculation of coordinate locations for some eight thousand places on the Earth, and development of the concepts of geographical latitude and longitude.

Little academic progress in geography occurred after the Roman period. For the most part, the Middle Ages (5th to 13th centuries AD) were a time of intellectual stagnation. In Europe, the Vikings of Scandinavia were the only group of people carrying out active exploration of new lands. In the Middle East, Arab academics began translating the works of Greek and Roman geographers starting in the 8th century and began exploring southwestern Asia and Africa. Some of the important intellectuals in Arab geography were Al-Idrisi, Ibn Battutah, and Ibn Khaldun. Al-Idrisi is best known for his skill at making maps and for his work of descriptive geography Kitab nuzhat al-mushtaq fi ikhtiraq al-afaq or "The Pleasure Excursion of One Who Is Eager to Traverse the Regions of the World". Ibn Battutah and Ibn Khaldun are well known for writing about their extensive travels of North Africa and the Middle East.

During the Renaissance (1400 to 1600 AD) numerous journeys of geographical exploration were commissioned by a variety of nation-states in Europe. Most of these voyages were financed because of the potential commercial returns from resource exploitation. The voyages also provided an opportunity for scientific investigation and discovery. These voyages also added many significant contributions to geographic knowledge. Important explorers of this period include Christopher Columbus, Vasco da Gama, Ferdinand Magellan, Jacques Cartier, Sir Martin Frobisher, Sir Francis Drake, John and Sebastian Cabot, and John Davis. Also, during the Renaissance, Martin Behaim created a spherical globe depicting the Earth in its true threedimensional form in 1492. Behaim's invention was a significant advance over two-dimensional maps because it created a more realistic depiction of the Earth's shape and surface configuration.

In the 17th century, Bernhardus Varenius (1622-1650) published an important geographic reference titled Geographic generalize (General Geography: 1650). In this volume, Varenius used direct observations and primary measurements to present some new ideas concerning geographic knowledge. This work continued to be a standard geographic reference for about a 100 year. Varenius also suggested that the discipline of geography could be subdivided into three distinct branches. The first branch examines the form and dimensions of the Earth. The second sub-discipline deals with tides, climatic variations over time and space, and other variables that are influenced by the cyclical movements of the Sun and moon. Together these two branches from the early beginning of what we collectively now call physical geography. The last branch of geography examined distinct regions on the Earth using comparative cultural studies. Today, this area of knowledge is called cultural geography.

During the 18th century, the German philosopher Immanuel Kant (1724-1804) proposed that human knowledge could be organized in three different ways. One way of organizing knowledge was to classify its facts according to the type of objects studied. Accordingly, zoology studies animals, botany examines plants, and geology involves the investigation of rocks. The second way one can study things is according to a temporal dimension. This field of knowledge is, of course, called history. The last method of organizing knowledge involves understanding facts relative to spatial relationships. This field of knowledge is commonly known as geography. Kant also divided geography into a number of sub-disciplines. He recognized the following six branches: Physical, mathematical, moral, political, commercial, and theological geography.

Geographic knowledge saw strong growth in Europe and the United States in the 1800s. This period also saw the emergence of a number of societies interested in geographic issues. In Germany, Alexander von Humboldt, Carl Ritter, and Fredrich Ratzel made substantial contributions to human and physical geography. Humboldt's publication Kosmos (1844) examines the geology and physical geography of the Earth. This work is considered by many academics to be a milestone contribution to geographic scholarship. Late in the 19th Century, Ratzel theorized that the distribution and culture of the Earth's various human populations were strongly influenced by the natural environment. The French geographer Paul Vidal de la Blanche opposed this revolutionary idea. Instead, he suggested that human beings were a dominant force shaping the form of the environment. The idea that humans were modifying the physical environment was also prevalent in the United States. In 1847, George Perkins Marsh gave an address to the Agricultural Society of Rutland County, Vermont. The subject of this speech was that human activity was having a destructive impact on land, especially through deforestation and land conversion. This speech also became the foundation for his book Man and Nature or The Earth as Modified by Human Action, first published in 1864. In this publication, Marsh warned of the ecological consequences of the continued development of the American frontier.

During the first 50 years of the 1900s, many academics in the field of geography extended the various ideas presented in the previous century to studies of small regions all over the world. Most of these studies used descriptive field methods to test research questions. Starting in about 1950, geographic research experienced a shift in methodology. Geographers began adopting a more scientific approach that relied on quantitative techniques. The quantitative revolution was also associated with a change in the way in which geographers studied the Earth and its phenomena. Researchers now began investigating the process rather than a mere description of the event of interest. Today, the quantitative approach is becoming even more prevalent due to advances in computer and software technologies.

In 1964, William Pattison published an article in the Journal of Geography (1964, 63: 211-216) that suggested that modern Geography was now composed of the following four academic traditions:
Spatial Tradition - the investigation of the phenomena of geography from a strictly spatial perspective.
Area Studies Tradition - the geographical study of an area on the Earth at either the local, regional, or global scale.
Human-Land Tradition - the geographical study of human interactions with the environment.
Earth Science Tradition - the study of natural phenomena from a spatial perspective. This tradition is best described as theoretical physical geography.

Today, the academic traditions described by Pattison are still dominant fields of geographical investigation. However, the frequency and magnitude of human-mediated environmental problems have been on a steady increase since the publication of this notion. These increases are the result of a growing human population and the consequent increase in the consumption of natural resources. As a result, an increasing number of researchers in geography are studying how humans modify the environment. A significant number of these projects also develop strategies to reduce the negative impact of human activities on nature. Some of the dominant themes in these studies include environmental degradation of the hydrosphere, atmosphere, lithosphere, and biosphere; resource use issues; natural hazards; environmental impact assessment; and the effect of urbanization and land-use change on natural environments.

Considering all of the statements presented concerning the history and development of geography, we are now ready to formulate a somewhat coherent definition. This definition suggests that geography, in its simplest form, in the field of knowledge that is concerned with how phenomena are spatially organized. Physical geography attempts to determine why natural phenomena have particular spatial patterns and orientation. This online textbook will focus primarily on the Earth Science Tradition. Some of the information that is covered in this textbook also deals with the alterations of the environment because of human interaction. These pieces of information belong in the Human-Land Tradition of geography.

Geography is a systematic study of the Universe and its features. Traditionally, geography has been associated with cartography and place names. Although many geographers are trained in toponymy and cart ology, this is not their main preoccupation. Geographers study the space and the temporal database distribution of phenomena, processes, and features as well as the interaction of humans and their environment. Because space and place affect a variety of topics, such as economics, health, climate, plants and animals, geography is highly interdisciplinary. The interdisciplinary nature of the geographical approach depends on an attentiveness to the relationship between physical and human phenomena and its spatial patterns.

Names of places...are not geography...know by heart a whole gazetteer full of them would not, in itself, constitute anyone a geographer. Geography has higher aims than this: it seeks to classify phenomena (alike of the natural and of the political world, in so far as it treats of the latter), to compare, to generalize, to ascend from effects to causes, and, in doing so, to trace out the laws of nature and to mark their influences upon man. This is 'a description of the world'—that is Geography. In a word, Geography is a Science—a thing not of mere names but of argument and reason, of cause and effect.

— William Hughes, 1863
Just as all phenomena exist in time and thus have a history, they also exist in space and have a geography.
— United States National Research Council, 1997
Geography as a discipline can be split broadly into two main subsidiary fields: human geography and physical geography. The former largely focuses on the built environment and how humans create, view, manage, and influence space. The latter examines the natural environment, and how organisms, climate, soil, water, and landforms produce and interact. The difference between these approaches led to a third field, environmental geography, which combines physical and human geography and concerns the interactions between the environment and humans.

The National Geographic Society:

The National Geographic Society began as a club for an elite group of academics and wealthy patrons interested in travel and exploration. On January 13, 1888, 33 explorers and scientists gathered at the Cosmos Club, a private club then located on Lafayette Square in Washington, D.C., to organize "a society for the increase and diffusion of geographical knowledge." After preparing a constitution and a plan of organization, the National Geographic Society was incorporated two weeks later on January 27. Gardiner Greene Hubbard became its first president and his son-in-law, Alexander Graham Bell, succeeded him in 1897.

In 1899, Bell's son-in-law Gilbert Hovey Grosvenor was named the first full-time editor of National Geographic magazine and served the organization for fifty-five years (until 1954), and members of the Grosvenor family have played important roles in the organization since. Bell and Gilbert Hovey Grosvenor devised the successful marketing notion of Society membership and the first major use of photographs to tell stories in magazines.

The first issue of National Geographic Magazine was published on September 22, 1888, nine months after the Society was founded. It was initially a scholarly journal sent to 165 charter members and nowadays it reaches the hands of 40 million people each month. Starting with its January 1905 publication of several full-page pictures of Tibet in 1900–1901, the magazine changed from being a text-oriented publication closer to a scientific journal to featuring extensive pictorial content and became well known for this style. The June 1985 cover portrait of the presumed to be 12-year-old Afghan girl Sharbat Gula, shot by photographer Steve McCurry, became one of the magazine's most recognizable images.

National Geographic Kids, the children's version of the magazine, was launched in 1975 under the name National Geographic World. From the 1970s through about 2010 the magazine was printed in Corinth, Mississippi, by private printers until that plant was finally closed.

In the late 1990s, the magazine began publishing The Complete National Geographic, a digital compilation of all the past issues of the magazine. It was then sued over copyright of the magazine as a collective work in Greenberg. National Geographic and other cases, and temporarily withdrew the availability of the compilation. The magazine eventually prevailed in the dispute, and on July 2009 it resumed publishing a compilation containing all issues through December 2008. The compilation was later updated to make more recent issues available, and the archive and digital edition of the magazine is available online to the magazine's subscribers.

Geography is divided into two main branches: human geography and physical geography. There are additional branches in geography such as regional geography, cartography, and integrated geography.

Sub-branches of Human Geography	Sub-branches of Physical Geography
1.Economic geography	1.Biogeography
2.Population geography	2.Water sources geography
3.Medical geography	3.Climate geography
4.Military geography	4.Geomorphology
5.Political geography	5.Lithology
6.Transportation geography	6.Ocean geography
7.Urban geography	7.Orology
	8.Potamology
	9.Global change in geography
	10.Hazards geography
	11.Mountain geography
	12.Cryosphere geography
	13.Arid regions geography
	14.Coastal and Marine geography
	15.Social geography
	16.Regional geography
	17.Applied geography
	18.Cartography
	19.Geographic information systems
	20.Historical geography
	21.History geography
	22.Remote sensing geography
	23.Hydrology
	24.Glaciology
	25.Biogeography

	26.Meteorology
	27.Pedology
	28.Paleogeography
	29.Quaternary Science
	30.Landscape ecology
	31.Geomatics
	32.Environmental geography
	33.Geography of Ramayana (New edition)

vii. OBSERVATION

The above-mentioned sub-branches described in Geography, but the earliest part of the Geography was described in the Ramayana, the ancient places, the rivers, the mountains and the seas in the directions. It is very common that Ramayana was not recognized as part of this geography. Thus, the script of the Geography of Ramayana is depicted as the basis of the region, rural areas, mountains and oceans in the Ramayana. Sethu and City of Lanka moves are based on modern science today. The earliest history is the source of science today.

Today geography is mainly divided into two parts. 1.Human Geography, 2. Physical Geography and above half of these are described in the Ramayana. While geography is important to this, the geography of the ancient history of the ancient Ramayana does not give much importance to the geography and add the Geography of Ramayana as part of modern geography today,

Not only geography but all of today's modern science is present in this Ramayana. So, consider this Ramayana in the world as a higher science. The knowledge of the endless knowledge in this Ramayana is obscure.

The history of Ramayana really happened. Not a favorable history. The epicenter of Ramayana in India is nothing more. Cities, mountains, structural capitals, rivers, marine, and forests today are worshiped by the devotees of a pilgrimage. Similarly, the government of Sri Lanka marks the signs of Ramayana in Sri Lanka.

If Sri Lanka, which is not in Ramayana today, exists, there is only one part of Lanka that merges with Sri Lanka. Ramayana is written in the languages of the Oriental languages. Thus, Ramayana is an authentic Geography of Ramayana.

Author

Muthyala Ramakrishna Rao

viii. ANALYSIS OF THE BOOK LET SCRIPT

We have observed this phenomenon in the history of the money that the vast dominions Dyane inexhaustible riches of kings ruled the land for the red during the end of the bloody battles on the ground and the rest who wrote the pages of history would be caught. Posting on the pages of history that in the time that hundreds of Hindu kings are also disappeared.

But many millions of years yet we know that the history of Rama and do over labor. Because it's the truth, the whole power of the law so that the avatar can Ramayana.

We have the knowledge and knowledge of the history we have seen a change in the rules and practices of the other, who succeeded with some of them, how shall we put it known by means of the history.

Some of the early period of the Guru-Disciple, a series of histories of the script is to this day we do get. Ana is wrong or cannot articulate it and are unable to be true. In which we shall realize that it is needed.

His + story = History relates his life and also related to his née.
His character, which he made to the public service programs, public development, constitutional development and generative of how we did this, and other things were on the wave of the history of this overture on the interests of this history.

The history of Sri Rama has taken place some millions of years ago. But history is not included in history until today. So, one can rethink Ramayana and Mahabharata as a history.

***Geography of Ramayana**:*

Geography of Ramayana (Sri Ramabdhi Shukthimani), a research work is a Synthesis of Mythologies, epics, ancient history, Surya Siddhanta (Surya theory) and modern science. To understand the Sethu (the great bridge) leading to the Lankanagara of the Ramayana, it is imperative that we know certain basic aspects which are described.
Reason for entitling of the book.

under fourteen heads in Sri Ramabdhi Shukthimani. Each aspect is based on spirituality as well as modern science. The facts explained in Ramayana are linked to the present day. The book explains how, as per past history, our country evolved into Bharatakhanda and Bharatavarsha and in which island and yet which direction this Bharatavarsha is situated from our country. Among the islands separated from our country (India), the Lankanagara of Ravana and the Simhala (Sri Lanka) are two separate islands. In the time of Rama, there was a description of only one island in the "Ramayana" with the passage of time 90% of the Lankanagara submerged in why the present Sri Lanka Government claims that the remnants of the Ramayana are found in Sri Lanka. The long Sethu (the great bridge) also submerged to a great extent in the sea and only a small part of the bridge is seen now between Dhanushkodi (India) to Thalaimannar (Sri Lanka). From the evidence in Srimadramayana as well as other important books as well as the Bhagavata and other mythologies it is established that the Lankanagara (city of Lanka not Sri Lanka) and

present Sri Lanka are two separate islands and that the great Sethu was not constructed between Sri Lanka and Rameswaram as is widely believed. All these facts are incorporated in Sri Ramabdhi Shukthimani (Geography of Ramayana) there is an important reason behind deeding the little Sri Ramabdhi Shukthimani for this work.
Geography of Ramayana (Sri Ramabdhi Shukthimani):
Sri=form of Lakshmi, also meaning embodiment of energy and also Sita-Lakshmi originated in the sea and Sita originated in the Earth.

Rama = The vital seeds of Vishnu and Shiva,
Abdhi=Sagara (ocean)
Shukthimani=Pearl
If we churn (Search) the ocean of the "Ramayana", we will find two pearls, the Sethu and Lankanagara. Both these had been constructed on the sea.

The divine sculptor Vishwakarma, at the behest of Brahma, the creator constructed Lankanagara a midst the sea for the dwelling of Lord Shiva similarly "Nala", a Vanara (of a tribe of human beings resembling monkeys and having tails), born off a seed of Viswakarma, at the behest of Sri Rama constructed the long Sethu. The Lankanagara and the Sethu are water associated structures.

The two pearls acquired through research of the books relating to the Ramayana when studded in a chain of a million suns reflecting on us making our lives meaningful. This is why the book is entitled Sri Ramabdhi Shukthimani. Every aspect in it is an essence of Science and Indian culture. So, the book synthesizes Indian Mythology and modern Science. It deals with fourteen aspects...

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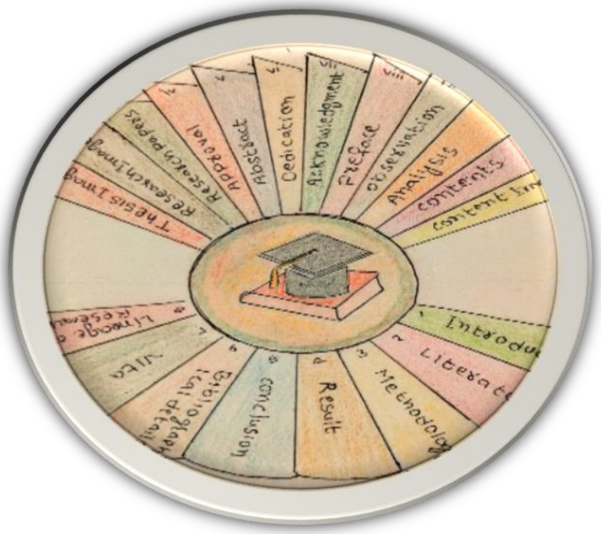


1.Introduction

Research

Research is "*creative* and systematic work undertaken to increase the stock of *knowledge*, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications." It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support *theorems*, or develop new *theories*. A research project may also be an expansion on past work in the field. Research projects can be used to develop further knowledge on a topic, or in the example of a school research project, they can be used to further a student's research prowess to prepare them for future jobs or reports. To test the validity of instruments, procedures, or experiments, research may replicate elements of prior projects or the project as a whole. The primary purposes of *basic research* (as opposed to *applied research)* are *documentation, discovery, interpretation,* or the *research and development* (R&D) of methods and systems for the advancement of human knowledge. Approaches to research depend on *epistemologies,* which vary considerably both within and between humanities and sciences. There are several forms of research: *scientific, humanities, artistic,* economic, *social,* business, *marketing, practitioner research,* life, *technological,* etc. The scientific study of research practices is known as *meta-research*.

Aristotle, (384–322 BC), one of the early figures in the development of the scientific method.

The word *research* is derived from the *Middle French* "*recherche*", which means "to go about seeking", the term itself being derived from the *Old French* term "*researcher*" a compound word from "re-" + "cerchier", or "searcher", meaning 'search ‘The earliest recorded use of the term was in 1577

Definitions

Research has been defined in a number of different ways, and while there are similarities, there does not appear to be a single, all-encompassing definition that is embraced by all who engage in it.

One definition of research is used by the OECD, "Any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this knowledge to devise new applications."

Another definition of research is given by *John W. Creswell,* who states that "research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue". It consists of three steps: pose a question, collect data to answer the question, and present an answer to the question.

The Merriam-Webster Online Dictionary defines research in more detail as "studious inquiry or examination; *especially*: investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws"

Ramayana Research

Describe: In Valmiki Ramayana City of Lanka 90% land sinking into the Ocean and remaining land melt in the Sri Lanka (Simhala) land due to climate, natural changes.

1.Sri Rama ruled the kingdom and the ruler of Ajodhya as the capital of 11,000 years. Then the ending of the incarnation of Lord Rama was ending.

2. Every age is divided into three parts. 1.Twilight period, 2. Actual period, 3. Twilight part period.

The Twilight period before the end of each age is the season. Nature changes in time, disasters and uncertainty. These environments can be set up to meet the weather parameters. The duration of the period after this Twilight part period of the dawn.
Saturation Time and Durational Durability Deluge (Global Warming). according to its Author.

3.Continued Sea level rise poses a direct threat to many of as per Ramayana describe the total of demon's living 100036000 in the city of Lanka.
Many of the demons were killed in the Rama and Ravana battle, and the rest of the demons ruled by Vibhishana the city of Lanka.

4.The city of Lanka covers an estimated length of 494.4719017 miles, and width is 49.44719017x3 miles. Total area of City of Lanka is 73350.738471244338867mile^2 as per Ramayana and Surya Siddhanta.

5.Moving away from the rising sea is a very dangerous, and at times fiscally impossible, choice far inhabitants. There are large volcanic islands. the majority of land is tightly controlled by traditional owners…so moving groups of demon's onto other demon's lands has been the source of ethnic conflict.

Divided so many parts of City of Lanka side to sides of Small tiny islands formed essay to moving of Lanka islands. That have large number of lands completely vanished under the ocean.

6.For the past 18,149,131 years.
Calculation of lord Sri Rama birth asper Ramayana evidence. Sri Rama birth 24 chaturyuga, now running 28 chaturyuga.

The Lanka island have been hotspot for sea level rise almost so many times the globe average around 7-10 millimeter per year.

One chaturyuga equal to:
Kaliyuga period-4,32,000 human years
Dwaparayuga period-864,000 human years
Tretayuga period-1,296,000 human years
Kierti (Kruta)yuga period-1,728,000 human years

One chatur yuga-4,320,000 human years

Four chaturyuga=4×4,320,000=17,280,000 human years
Dwaparayuga =864,000 human years
Kaliyuga period started= 3102 human years
AD =2019 human years

Total years=18,149, 131
11,000 ruled by Sri Rama

Lord Sri Rama birth past 18,160,131 human years ago.

7.The scientists use to historical evidences; the author uses evidence of Ramayana, Indian mythological and modern science. The remaining part of City of Lanka land is melted in southern side of Simhala (Sri Lanka) land.

The Lanka island will since into Ocean, and in a geologically long amount of time if will dip beneath the waves determined that the isle is Ascending at a rate of eight inches every thousand years. 18,160,131 years ago, a major land side occurred on the Lanka islands (parts of City of Lanka) north-east side face running into the ocean. The Lanka land is so, many plates formed, if are moving past each other, some plates are sink in Ocean, some other plates are melting nearest Sri Lanka island (Simhala).

After the completion of Rama's Incarnation, the City of Lanka and Sethu (The Great Bridge) moved from the southern direction to the north-east. According to continental drift, the island is north-northeast move.

8.The third angle that two-dimensional distance is derived from the Pythagorean theorem.
In mathematics, the **Pythagorean theorem**, also known as **Pythagoras' theorem**, is a fundamental relation in Euclidean geometry among the three sides of a right triangle. It states that the square of the hypotenuse (the side opposite the right angle) is equal to the sum of the squares of the other two sides. The theorem can be written as an equation relating the lengths of the sides *a*, *b* and *c*, often called the "Pythagorean equation.

If *c* denotes the length of the hypotenuse and *a* and *b* denote the lengths of the other two sides, the Pythagorean theorem can be expressed as the Pythagorean equation:

The Pythagorean equation relates the sides of a right triangle in a simple way, so that if the lengths of any two sides are known the length of the third side can be found. Another corollary of the theorem is that in any right triangle, the hypotenuse is greater than any one of the other sides, but less than their sum.

According to this theorem, the distance between City of Lanka and Sri Lanka is 514. 9278 miles.

The city of Lanka was 18,160, 131 years, 514,9278, miles drifting, and 10% of the city's Lanka land merged into the south part of Sri Lanka land.
The City of Lanka was also traveled from south to north-east as per continental drifting geographical basis.
There is no mountains and islands in between the City of Lanka and Sri Lanka (Simala island). City of Lanka is the southern equator, meaning that the distance between these two is only 29. 330722 miles. The north-east of the area, where the land area of the City of Lanka monetary system is divergent in drifting into the sea. Geologically, depending on speed of mass. The path of the Lanka was followed by the method.
The southern province of Sri Lanka is the southern provincial merger of 10% of the City of Lanka land area. The remaining Part of 90% is dug in the sea by land drifting.
There is no mention of Sri Lanka or Sinhala Island in Valmiki Ramayana, but the Sri Lankan government says that there are approximately 44 places of the Ramayana. The only reason of the merger of the City of Lanka.

Distance Speed Time Formula

Speed is a measure of how quickly an object moves from one place to another. It is equal to the distance traveled divided by the time. It is possible to find any of these three values using the other two.

The positions of the words in the triangle show where they need to go in the equations. To find the speed, distance is over time in the triangle, so speed is distance divided by time. To find distance, speed is beside time, so distance is speed multiplied by time.

Conclusion: Due to the above points, the city of Lanka is drifting from the south to the north-east, with 90% of the landlocked sink in the ocean and the remaining 10% of the city land merged with Sri Lanka.

The islands are drowned in the sea, the islands move away from the left, geologists have elaborated.
The continental is drowned in the oceans. And there are newer islands from the sea.

Science is good for human beings, but the nature is harmful to nature.

Natural calibration should be altered but artificially altered it is harmful to the world.

Nature cannot be satisfied by the loses, but the damage done to previous generations.

Reference: The methods described by scientists are as follows.

1. Report says Solomon island sinking into Ocean due to man-made climate change.

2.California's Catalina island will sink into Sea; may cause LA Tsunami.

3. Hawaiian Islands. Notice how the islands tend to get smaller going toward the northwest. The ages of the islands get progressively older toward the northwest as the plate has traveled in that direction from the hotspot. The hotspot that created the islands is located underneath the big island of Hawaii. (Source: United States Geological Survey-USGS: The source of this map and more information regarding geologic hotspots are found at.

4. Past and present locations of Yellowstone Hotspot as North American Plate traveled over hotspot. The orange circles represent calderas associated with volcanic activity resulting from the hotspot. (Source: National Park Service-NPS: The source of this map regarding the Yellowstone Hotspot is found at.

5.Valmiki Ramayana

6.Brahmanda Srishti Vijyanam by Kota Venkatachalam

Thanking you,

Your faithfully
Muthyala Ramakrishna Rao
M.A
Author of Geography of Ramayana

Hindu mythology

Refers variously to the collected myths of a group of people or to the study of such myths.

A folklore genre, myth is a feature of every culture. Many sources for myths have been proposed, ranging from personification of nature or personification of natural phenomena, to truthful or hyperbolic accounts of historical events to explanations of existing rituals. A culture's collective mythology helps convey belonging, shared and religious experiences, behavioral models, and moral and practical lessons.

Myth and religion

1	Basque mythology	12	Islamic mythology
2	Bengali mythology	13	Japanese mythology
3	Celtic mythology	14	Jesus in comparative mythology
4	Chinese mythology	15	Jewish mythology
5	Christian mythology	16	Korean mythology
6	Egyptian mythology	17	Magic and mythology
7	Greek mythology	18	Maya mythology
8	***Hindu mythology***	19	Religion and mythology
9	Hittite mythology	20	Roman mythology
10	Inca mythology	21	Tahiti and Society Islands mythology
11	Irish mythology	22	Norse mythology

Hindu mythology *are mythical narratives found in Hindu texts such as the Vedic literature, epics like Ramayana, and Mahabharata the Puranas, the regional literatures Sangam literature and Periya Puranam. Hindu mythology is also found in widely translated popular texts such as the Panchatantra and Hitopadesha, as well as Southeast Asian texts.*

Hindu mythology does not have a consistent, monolithic structure. The same myth appears in various versions, varies with diverse traditions, modified by various Hindu traditions, regional beliefs and philosophical schools, over time. These are taken to have deeper, often symbolic, meaning, and which have been given a complex range of interpretations.

The Hindu mythology literature is found in genre of *Hindu texts* such as:

Vedic: Four Vedas 1. Rig Veda, 2. Sama Veda, 3. Yajur Veda and 4. Atharva Veda.

Epics: 1. ***Ramayana***,2. Mahabharata

Puranas:

1. Vishnu Purana
2. Naradiya Purana
3. ***Padma Purana***
4. Garuda Purana
5. Varaha Purana
6. Bhagavata Purana
7. Matsya Purana
8. Kurma Purana
9. Linga Purana
10. Vayu Purana (in some texts Vayu Purana is replaced with Shiva Purana as the scholars consider it as part of Linga Purana).
11. Skanda Purana
12. Agni Purana
13. Brahmanda Purana
14. Brahmavaivarta Purana
15. Markandeya Purana
16. Bhavishya Purana
17. Vamana Purana
18. Brahma Purana

Many of these legends evolve across these texts, the character names change or the story is embellished with greater details, yet the central message and moral values remain the same. According.

Every Hindu myth is different; all Hindu myths are alike. (...) Each Hindu myth celebrates the belief that the universe is boundlessly various, that everything occurs simultaneously, that all possibilities may exist without excluding the other. (...) There is no single basic version of a Hindu myth; each is told and retold with a number of minor and major variations over the years. (...) Great myths are richly ambiguous and elusive; their truths cannot be filed away into scholar's neat categories. Moreover, myths [in Hinduism] are living organisms that change constantly. (...)

Hindu mythology shares the creative principles and human values found in mythology everywhere. However, the particular details vary and its diversity is immense, according to Doniger. The Hindu legends embed the Indian thought about the nature of existence, the human condition and its aspirations through an interwoven contrast of characters, the good against the evil, the honest against the dishonest, the dharma-bound lover against the anti-dharma bully, the gentle and compassionate against the cruel and greedy. In these myths, everything is impermanent including matter, love and peace. Magic and miracles thrive, gods are defeated and fear for their existence, triggering wars or debates. Death threatens and re-threatens life, while life finds a way to creatively re-emerge thus conquering death. Eros persistently prevails over chaos.

The Hindu mythologies integrate in a wide range of subjects. They include stories about how and why cosmos originated (*Hindu cosmology*, *cosmogony*), how and why humans or all life forms originated (anthropogony) along with each's strengths and weaknesses, how gods originated along with each's strengths and weaknesses (theogony), the battle between good gods and bad demons (theomachy), human values and how humans can live together, resolve any disagreements (ethics, axiology), healthy goals in stages of life and the different ways in which each individual can live (householder, monk, *purusartha*), the meaning of all existence and means of personal liberation (soteriology) as well as legends about what causes suffering, chaos and the end of time with a restart of a new cycle (eschatology).

2. LiteITERATURE

PART-1

1. Yojana

2-1-1. Description of Yojana: Meaning of Yojana: yojana. [Skt.] n. Joining, union, junction. cercadamu, kurpu. A measure of distance equal to four krosas, that is about ten miles, Amada. yojincu yojintsu. v. a. To join, unite. kurcu.

Yojana (nt) (Vedic yojana) 1. The yoke of a carriage J.Vi.38,42 (=Ratha-yuga).2. a measure of length; as much as can be travelled with one yoke (of oxen), a distance of about 7 miles, which is given by Bdhgh as equal to 4 gavutas (DhA.II,13). It occurs in descending scale of yojana-tigavuta-usabha at DhA, I,108, Dh,60: J.V,37(yojana-yojana-vitthata each a mile square);

2-1-1-1. Defining the Yojana:

Turning to India, we find a unit of distance, called the yojana, that at first glance seems as ill-defined as the medieval English furlong or foot. The yojana is defined to be either 16,000 or 32,000 hastas, where a hasta, or cubit, is 24 angulas, or fingers. That there were at least two sizes for the yojana is upheld by the writings of classical Indian astronomers. The fifth-century astronomer Aryabhata used a yojana of about 8 miles, and the astronomy text Surya-siddhanta a yojana of roughly 5 miles.

The first hint of the ancient history of the yojana comes from Strabo, who describes the experiences of Megasthenes, a Greek ambassador to India in the period following Alexander the Great. Strabo cites Megasthenes as saying that along the royal road to the Indian capital of Palibothra (thought to be modern Patna), pillars were set up every 10 stadia. The British scholar Alexander Cunningham argues that the pillars marked an interval of one krosa. Since there are traditionally 4 krosas per yojana, this implies 40 stadia per yojana. Steichen gives 400 cubits per stadium, and this implies 16,000 cubits per yojana.

Since the smaller of the two definitions for the yojana assigns it 16,000 hastas, we can tentatively identify the hasta, or Indian cubit, with the Greek cubit. This unit is well known, and it enables us to compute the length of the yojana. The Greek cubit is 462.42 millimeters. This gives us a small yojana of about 4.6 miles, in rough agreement with texts such as the Surya-Siddhant.
Steichen points out that the stadium was defined as 1/600 of a degree of latitude. This would mean that there are 15 small yojanas per degree. Likewise, there are 60 krosas per degree, or 1 krosa per minute.

Here we must make a technical observation about latitudes. Consider the earth to be a sphere, rotating on a line through the north and south poles called the polar axis. The latitude of a person facing north at some point in the northern hemisphere is the angle from his horizon up to the polar axis. That angle is 0 degrees at the equator and grows to 90 degrees at the North Pole. The length of a degree of latitude is the distance a person would have to travel north for his latitude to increase by 1 degree. On a perfect sphere, this distance would be the same at all latitudes. But the earth is slightly flat at the poles and bulges at the equator. This makes for a degree of latitude slightly smaller at the equator than further north.

Steichen noted that the Greek stadium is 1/600 of a degree of latitude at Mycenae in Greece, and he argued that it was deliberately defined this way in ancient times. I propose that to define the yojana in India the degree of latitude at the equator was used. This means that the hasta should be 460.7 millimeters instead of 462.4 millimeters (and the yojana would still be about 4.6 miles). I shall point out below why this fine distinction is important.

At first glance, the yojana of 32,000 hastas should be twice as long as this, or about 9.2 miles. But there is reason to think that these two yojanas use different standards for the hasta.

Hiuen Thsang, a Buddhist pilgrim who visited India in the seventh century, wrote of yojanas in terms of a Chinese unit of measure called the li. He reported that a yojana consisted of 40 li according to Indian tradition but the measure in customary use equaled 30 li and the measure given in sacred texts was only 16. The li has taken on many values during China's history. But using values for the Thang dynasty, when Hiuen Thsang lived, we can compute that the yojana of 16 li matches the small yojana of 4.6 miles.

Could the yojana of 30 li match the larger yojana of 32,000 hastas? If it does, then the larger yojana has to use a slightly smaller hasta, 30/32 as long as the hasta in the shorter yojana. Multiplying our hasta of 460.7 millimeters by 30/32, we get a smaller hasta of 431.9 millimetres. The larger yojana of 32,000 hastas then comes to 8.59 miles. At the equator, that is 1/8 of a degree of latitude.
In an investigation to be reported in a later article, I found that the geocentric orbits of the planets Mercury, Venus, Mars, Jupiter, and Saturn align closely with the dimensions of dweepa in Bhumandala. Bhumandala and dweepas are features of cosmic geography defined in the Fifth Canto of the Srimad-Bhagavatam. To align planetary orbits with dweepas we need to be able to convert the yojanas used in the Bhagavatam into the miles or kilometers of modern astronomy. I found that the alignment of orbits and dweepas works well if we assume about 8-1/8 miles per yojana.

To compare orbits with the structure of Bhumandala, I used modern ephemeris programs for orbital calculations. I was most interested in the epoch of about 3000 B.C., the traditional time of Krishna's manifest pastimes on earth, as described in the Bhagavatam. It turns out that at this epoch the planetary orbits align closely with dweepas in Bhumandala at a sharply defined value of 8.575 miles per yojana. This is very close to the figure of 8.59 miles based on the hasta of 432 millimetres. So, the value of the yojana we get by historical research is confirmed by completely independent calculations having to do with planetary orbits and the astronomy of the Bhagavatam.

2-1-1-2. Yojanas and Yugas:

Yojana and 7 Yugas सप्त युञ्जन्ति रथमेकचक्रमेको अश्वो वहति सप्तनामा (ऋक्, १/१६४/२) – अस्यवामीयसूक्त युजिर् योगे, Yujir verb= to add, this forms yuga and yojana-both unite in 7 ways. $ Two Yojanas by Bhāskarāchārya-II for 2 purposes- 1. Astronomy- Siddhānta-śiromaṇi -earth is standard- Equator = 5000 yojanas, 1 yojana = 8 Kms. 2.Human use-Līlāvatī-Angula (finger width) is standard. 1 Yojana = 32,000 hand = 16 Kms. शत योजने ह वा एष (आदित्य) इतस्तपति (कौषीतकि ब्राह्मण उपनिषद् ८/३) Sun is at 100 Yojanas. Here, yojana is diameter of sun. It is at 108(about 100) yojanas. Jain astronomy-1 Pramāṇa yojana = 500 Ātmā yojana =1000 Utsedha yojanas Modern Physics-(1) Definitions of Meter- (a) 10 part of distance between equator and north pole along Paris. (b) Distance between 2 marks on a rod at zero degree at Paris. (c) 16,50,763,73 times wave-length of a radiation of Krypton86. (d) linked with second by speed of Light-Light travels 2,99,792.458 Kms in 1 second. (2) Foot = length of Human foot = 30.48 Cms. (3) Nautical Mile-1-minute arc on equator = 6076.115 feet or 1852 meter. Astronomical measures-(1) Astronomical unit (AU)-Semi major axis of earth orbit =distance of sun =1.496 x 10 Meters. (2) Persec (Pc)-This is distance at which 1 AU makes angle of 1 second 1 Persec = 3.0856 x 10 Meters = 3.26 Light years Kilo-persec (Kpc) = 1000 Pc, Mega-persec (Mpc) = 10 Pc. (3) Light year is distance travelled by light in 1 tropical year = 9.4605 x 10 Meter Gaja means elephant and measuring rod both, it indicates number 8. 7 16 15 11 6.

2-1-1-3. Nara yojana = Human measure, Large measures:

1 Angula (finger width) is standard. 12 angula = 1 Vitasti (palm spread). 2 Vitasti = 1 Hasta (hand) =45 Cm, 1 angula =1.875 Cm. 1 Daṇḍa = 4 hasta. It is also called Puruṣa (man)- height with hands raised=fathom of 6 feet. 4000 Daṇḍa = 1 yojana = 32000 hand =16 kms.
Small measures-Bṛhat-samhitā (58/1-2) of Varāhamihira 8 Paramāṇu (atom) = 1 Raja or dust particle (Ratha-reṇu as per Mānasāra) 8 Raja =1 Vālāgra (hair end), 8 Vālāgra = 1 Likśā (lice) 8 Likśā = 1 Yūka, 8 Yūka = 1 Yava (barley grain width) 8 Yava = 1 Angula (finger width) = 1.875 cm. 1Paramāṇu Śrīpati calls it the size of dust particles seen in sun-rays. This is Trasareṇu which has 60 Aṇus (atom) as per Āyurveda. Thus, 1 atom = 1.2 x 10 -7 Cm. Lalita-vistara tells Paramāṇu-raja = Angula x 7 -10 = 0.6 x 10 -7 Cm. This is actually radius of Hydrogen atom. Trasareṇu of Tiloya-pannati =1 Angula x 8 -9 = 1.4 x 10 -8 Cm Any measure is in general called Angula. Puruṣa sūkta-1 tells the whole world as angula. When measure is only 1 angula, it is called Anguṣṭha. Bālakhilya planets are called of 1 Anguṣṭha. Here earth is Puruṣa of 96 angulas.

2-1-1-4. Bhu-Yojana:

With earth as Standard Sūrya-siddhānta (1/59)-Diameter = 1600 Yojana Pañcha-siddhāntikā (1/18) Circumference = 3200 yojana Āryabhaṭīya (1/10) and Lalla- Diameter = 1050 Yojanas Siddhānta-śiromaṇi, Golādhyāya, Bhuvana-koṣa 52- Diameter =1582 1/24 yojanas, Circumference =4967 Yojana in space, earth has been called Padma (lotus) of 1000 petals-Padma-purāṇa, Sṛṣṭi khaṇḍa (40/2-3) Or Rigveda (6/16/13-14). Counting atmosphere as part of earth, its 1000 part is equal to Aryabhata yojana. Bhāgavata purāṇa, part 5 calls planetary orbit up to Neptune as Disc-shaped earth of 100 Crore yojana diameter. Middle age astronomers have multiplied it by 360 to make It Divya yojana as diameter of Brahmāṇḍa (galaxy). Half part of that is loka (lighted) part of 50 crore yojanas, in which 7 dweepas (continents) and Samudra (ocean) are described as same names found on earth. Remaining part is Aloka (dark) region. Here, 1 yojana = 1000 part of earth diameter = 12.75628 Kms.

Dvīpas and Samudras of Bhāgavata Purāṇa Serial Radius Breadth (in 1000 yojana) Name 1. 50 50 Jambū-dvīpa 2. 150 100 Lavaṇa (salt) samudra 3. 350 200 Plakśa-dvīpa 4. 550 200 Ikśu-rasa (sugar cane juice) samudra 5. 950 400 Śālmali-dvīpa 6. 1350 400 Madya (liquor) samudra 7. 2150 800

Kuśa-dvīpa 8. 2950 800 Ghṛta (butter) samudra 9. 4550 1600 Krauñcha-dvīpa 10. 6150 1600 Kśīra (milk) sāgara 11. 9350 3200 Śaka-dvīpa 12. 12,550 3200 Dadhi (curd) samudra 13. 15,750 3200 Mānasottara-parvata 14. 18,950 3200 Puşkara-dvīpa 15. 25,350 6400 Madhura-jala (sweet water) samudra 16. 41,100 15,750 Loka-varşa (bright zone) 17. 1,25,000 83,900 Hiraņya-varşa 18. 2,50,000 1,25,000 Aloka-varşa (dark zone) Earth Sun Mercury Dv īpa Apparent rotation of a planet around earth or its orbit forms Dv īpa Inner radius=radius of earth orbit-planet Outer radius=sum of radii.

Comparison of dweepas and Samudras with planetary orbits Serial-Planet Point Radius (1000 yojana) Radius of dweepa Error% Name of region 1. Mercury Near 5976.0 6,150 2.1 K śīra-sāgara 2. Mercury Far 15,701.1 15,750 0.3 Mānasottara parvata 3. Venus Near 2851.0 2,950 3.5 Ghṛta-sāgara 4. Venus Far 18,813.0 18,950 0.7 Puşkara-Dvīpa 5. Mars Near 4,090.0 4,550 11.2 Krauñcha-Dvīpa 6. Mars Far 25,736.5 25,350 -1.5 Jala-samudra 7. Jupiter Near 43,422.8 41,100 -5.3 Jana-sthāna 8. Saturn Far 1,21,599.6 1,25,000 2.8 Hiraņya-varşa 9. Sun (mean) 10,840.4 10,950 1.0 Mean of Dadhi samudra 10. Ceres* Near 16, 312.8 15,750 -3.4 Mānasottara parvata 11. Ceres* Far 42,683.2 41,100 -3.7 Jana-sthāna 12. Urans Far 2,29,811.0 2,50,000 8.8 Aloka-varşa.

Note-1. * Ceres is the main body in the asteroid belt between mars and Jupiter. Its orbit is calculated for figures of 2000 AD. 2. Jambū-Dvīpa of 50,000 yojana radius is extent of gravitational field of earth in which an object will be in orbit. Its axis in direction of earth rotation in Meru of 1,00,000 yojanas. 3. Dadhi-samdra is solid planet zone. Its mean circle is orbit of earth-largest solid planet.

2-1-1-5. Bha Yojana:

Star Measure in astronomy texts, value of yojana is determined by comparing the standard measure of earth in diameter or circumference with modern measure in Kms. Without any reason, we assume that the same measure is used for distance of sun or star planets-which look like stars. There measure needs to be found by comparing sun diameter with current measures. Sūrya-siddhānta (1/59)-Diameter of earth = 1600 Yojana It is 12,756.28 Km. (equator) in modern measure. So, this yojana = 12,756.28/ 1600 =7.9727 Km. Sun diameter = 6500 Yojana (Sūrya-siddhānta 4/17) It is 13,92,000 Km. in modern measures. So, this yojana= 13,92,000/ 6500 = 214.1538 Km. Solar yojana/earth yojana =214.1538/7.9727 = 26.86 or 27 approximately. Bha means star and indicates number 27. So, measure of sun (a star) and star-like planets can be called Bha-yojana which means star-measure or 27 (Bha) yojanas. (1) Sun orbit=43,31,500 Yojana (Sūrya-siddhānta 12/86) Diameter = 1.47 x 10 Kms., Modern value = 1.50 x 10 Kms. (2) Nakśatra Kakśā =Sun orbit x 60 (Sūrya-siddhānta 12/80) This is obviously within solar system as size of Brahmāņḍa is much larger. This is small planets called Bālakhilyas, 60,000 in number rotating around sun. Their size in Anguşṭha = 1 angula (Bhāgavata purāņa 5/21/17) Earth can be taken as a puruşa of 96 angula = 12,756.28 Km. So, Bālakhilya size is 12,756.28/96 = 135 km. NASA estimate of 2005 is that there are 70,000 Plutonic bodies of more than 100 Km Diameter at 44-65AU distance (60 AU average in Bhāgavata) (3) Brahmāņḍa circumference = 1.87 x 10 Bha-yojana (Sūrya-siddhānta 12/90) Diameter = 1.3 x 10 Light year, Modern measure 10 LY. 55 16 88.

2-1-1-6. Dhāma Yojana:

(त्रिंशद्धाम वि-राजति वाक् पतङ्गाय धीमहि । प्रति वस्तोरहद्युभिः ॥ (ऋक्, १०/१८९/३) सदृशीरद्य सदृशीरिदु श्वो दीर्घं सचन्ते वरुणस्य धाम । अनवद्यास्त्रिंशतं योजनान्येकैका क्रतुं परियन्ति सद्यः ॥) (ऋक्, १/१२३/८) Measure of solar system is given in Ṛk veda (10/189/3) For 30 Dhāma brightness is more, which is understood as Vāk =field of Patanga =sun. Each Vasta (location) of Dyu (sky) is measured in Ahar. Ahar and vasta both mean days. Dhāma and yojana both words have been used in Ṝgveda (1/123/8) for measure of Uşā (twilight) They (Uşā) are same today and will be same tomorrow. They spread towards place of Varuṇa, one by one. Dhāma of Varuṇa are 30 without break. They are ahead of Kratu =sun by 30 Yojanas. 1.Meaning in Space-Zone of Varuṇa is galaxy. Within that, there are 30 zones one after other where light of sun is more than the background of galaxy. Light of each zone is more than darkness and less Sun itself and is called Uşā (twilight) of 30 levels in 30 zones called Dhāma. Measure of Dhāma here is not defined. Here measuring rod is earth itself as in Sūrya-siddhānta- मा छन्दः तत् पृथिवी, अग्निर्देवता. (मैत्रायणी संहिता, २/१४/९३, काठक संहिता, ३९/३९) Measure of loka has started in Taittirīya upanişad (2/8) from Earth-called Manuşya-loka. Bṛhadāraṇyaka upanişad (3/3/2)-...द्वात्रि◌ंशतं वै देवरथाह्न्यन्ययं लोकस्त◌ं समन्तं पृथिवी द्विस्तावत्पर्येति ता◌ं समन्तं पृथिवीं द्विस्तावत्समुद्रः पर्येति.... (बृहदारण्यक उपनिषद् ३/३/२) = 32 ahar (Plural is ahāni) is measure of Deva-ratha, its double in all directions is Pṛthivī (enclosure of solar system), that is surrounded all around by Samudra (ocean) of twice the size. Thus, all measure starts from earth as measuring rod. But there are 3 Dh āmas within earth, so Dhāma 3 = earth. Distance from center of measure is equal to radius of earth. Radius of Dhāma 4 =2 x earth radius, Radius of Dhāma 5 = 4 x earth radius, and so on.
D = r x 2 n-3 r 2 1 Earth 3 4 ahargaŋa=2r 4r8r Ahargaŋa Scale

Kśara Dhāma Meaning of Dhāma on earth-Varuṇa is lord of west direction. Uşā (twilight) goes up to 30 dhāmas in that direction ahead of place of sun rise. In India, it is taken as 15 degrees west of sun-rise. This is called Sandhyā (joint) period and in Kali-yuga of 1200 years, 2 sandhyā are of 100 years each. Thus, in a day of 24 hours, it will be of 1 hour each equal to 15-degree rotation of earth. In west, it is taken as 18 degrees which is more correct for European latitudes. Thus 1 Dhāma = ½ degree longitude. This will differ for each latitude circle and will decrease as we move away from equator. On equator, it is fixed and can be called a Dhāma-yojana, equal to half degree arc. Thus, 1 Dhāma-yojana = 40,000/720 = 55.5 kms. Kaţha upanişad 1/3/1) gives measure of galaxy in that measure- ऋतं पिबन्तौ सुकृतस्य लोके गुहां प्रविष्टौ परमे परार्धे । छायातपौ ब्रह्मविदो वदन्ति पञ्चाग्नयो ये च त्रिणाचिकेताः ॥ (कठोपनिषद् १/३/१) = Persons doing good finally enter the largest cave of size (circumference) of parārdha yojana (0.5 x 10 17 x 55.5 kms.). Knowers of Brahma call it a combination of light and shadow having 5 Agnis (condensations) called (1) Svayambhū (universe as collection of 10 11 galaxies), (2) Parameşţhī maṇḍala (galaxy with stars), (3) solar system of 30 dhāmas (2 30 x earth size), (4) Chāndra maṇḍala (sphere containing orbit of moon), and (5) earth. Out of these, the last 3 are jointly influencing us- called 3 eyes of Śiva. Chiketa = distinct, Nāchiketa =indistinct, mixed. Here diameter of galaxy comes to 97000 LY, between 100000 and 95000 LY estimates of NASA in 1990 and 2005. Same measure is used in Ṛgveda (1/164/12) etc. where Brahmāṇḍa has always been called Pura (structure) of Parārdha size. Yojaana has been used only once in Ṛgveda, so it can have only this meaning.

Sun Earth to 17 ahargaṇa Earth Moon 3 9 15 17 aharga ṇa Mars Mercury Venus

Solar system 33 aharga ṇa 27 Maitreya 21 Rathantara s āma Saturn 17 aharga ṇa Earth Sun : Solar System-Steps of Viṣṇu Sun Heat Zone 100 diameter Bright 1000 D 10 D 5 7 Light Uṣā Sun as point Step 1 Step 2 Step 3 Parama pada Brahmāṇ ḍa.

Zones of Solar system 1. Vaşaţkāra-Vāk (field of Sun) is şaţ (6), so it is called Vaşaţkāra. These are zones of 3 to 33at intervals of 6 ahargaṇa each. (a)3 ahargaṇa =Earth itself. (b)9 ahargaṇa = earth x 2 6 = earth x 64. Moon is at 61 radius distances. (c)15 ahargaṇa = earth x 2 12 = earth radius x 2.6125 x 10 7 = Varāha zone. Difference between radii of Earth and venus orbits = (150-108) x 10 6 Km. Thus, Varāha zone = (26.125/42) x 100 = 62.2%. (d) 21 ahargaṇa = earth x 2 18 = Radius of 1672 x 10 6 Km. Chakra of Ratha of sun has1000 yojana radius. Here, yojana =diameter of sun. So, radius is 13,92,000 x 1000 = 1392 x 10 6 Km. This is also called Sahasrākśa zone, where ākśa=sun. Thus 21 crosses ratha and is called Rathantara-sāma. (e) 27 ahargaṇa = earth x 2 24 = Radius of 1.07 x 10 11 Km. This is called Maitreya-maṇḍala. In Viṣṇu purāṇa (2/7) etc. it is stated of 10 5 yojana. Here, yojana is sun diameter. This is also called Sāvitrī =creative. It is 2 24 times earth and chhanda of 24 letters is called Gāyatrī. Gāyatrī also means Sāvitrī. (f) 33 ahargaṇa = earth x 2 30 = Radius of 6.848 x 10 12 Km. Latest estimate of farthest objects is Oort cloud at distance between 75 to 150 thousand AU. Larger limit =1.5 x 10 8 x 1.5 x10 5 Km = 2.25 x10 13 Km (g) 34 ahargaṇa is of double size called Prajāpati. 2. Sun centric Trişţup chhanda-Trişţup chhanda has 4 parts of 11 letters each. 3 parts are 3 zones of solar system called 3 steps of Vişṇu. Complete Chhanda is of 44 letters. That is measure of Maharloka. It is taken 43 only as Chhanda can be of 2 letters more or less. It is equal to width of spiral arm of galaxy, called Śeşa-nāga. It has about 1000 stars called 1000 heads of Śeşa. The 3 zones or steps of Vişṇu are zones of heat, brightness and light. 3. Two Parts-Planetary zone is called Bṛhaspati, the largest planet. Outer zone is after 1000 Sun-diameters = Sahasrākśa or Indra- शं नो इन्द्रो बृहस्पति शं नो विष्णुरुरुक्रमः। Galaxy and its spiral arm

2-1-1-7. Atma-Yojana:

Solar yojana for measure of solar system, diameter of sun itself has been taken as a yojana. It can be also called Ātmā-yojana, as sun is ātmā (soul) of universe (Yajurveda 7/42 etc.) It is seen from Vāyu purāṇa (6/12) where Varāha is stated 100 yojana high and 10 yojana wide. As it is description of solar system, height of from sun is 100 yojana and in its body of 10 yojana, earth is like a dot on its tooth. Thus, earth is between 100 and110 yojanas from sun. Taking sun-diameter as unit, it is 108-109 diameters. Examples- (1)Heat zone (Tāpa-kśetra)-Up to 100 yojanas from sun- शत योजने ह वा एष (आदित्य) इतस्तपति (कौषीतकि ब्राह्मण उपनिषद् ८/३) स एष (आदित्यः) एक शतविधस्तस्य रश्मयः । शतविधा एष एवैक शततमो य एष तपति (शतपथ ब्राह्मण १०/२/४/३) (2) Bright zone (Raśmi-kśetra)-Up to 1000 yojanas from sun-युक्ता ह्यस्य (इन्द्रस्य) हरयः शतादशेति । सहस्रं हैत आदित्यस्य रश्मयः (इन्द्रः=आदित्यः) जैमिनीय उपनिषद् ब्राह्मण १/४४/५) असौ यस्ताम्रो अरुण उत बभ्रुः सुमङ्गलः । ये चैनं रुद्रा अभितो दिक्षु श्रिताः सहस्रोऽवैषां हेड ईमहे ॥ (वा.यजु.१६/६) (3) Maitreya Maṇḍala -1 lakh yojanas-Vişṇu purāṇa (2/8) Wheel of ratha-1000 yojana =zone of Indra (Sahasrākśa, akśa or chakśu = eye which is sun, Sahasra =1000)-This is grand cycle of planetary motions up to Saturn, so it is wheel. That is the basis of yugas in which revolution of planets are stated (Bhagaṇopapatti) Ratha = Diameter 9000 yojana. Radius = 4500 yojana, up to orbit of Pluto. Īşā-daṇḍa (axle rod)-Extent of solar wind up to 9000 yojana. Its middle zone is at 6750, Which is Nakśatra-kakśā (orbit of small bodies, Bālakhilya = small planets at end) at 60 AU i.e. 60 times distance of sun (Sūrya-siddhānta 12/80) Spread of Solar Ratha (=body)-157 lakh yojanas x 1392000 kms. = 2 LY diameters.

2-1-1-8. Prakāśa Yojana:

Length by Speed of Light Truṭi has been defined as time taken by a sharp needle to pierce a petal of rose. -Vaṭeśvara-siddhānta, madhyamādhikāra,7; Siddhānta-śiromaṇi, madhyamādhikāra, 26 But this is not a definition of unit-hardness and width of rose-petal, sharpness of needle and force applied to it are unspecified. Bhāgavata purāṇa (3/11/5) defines it as time taken by light to cross 3 Trasareṇu or 3 units larger than it which are missing- जालार्क रश्म्यवगतः खमेवानुपतन्नगात् । त्रसरेणु त्रिकं भुङ्क्ते यः कालः स त्रुटिः स्मृतः (भागवत पुराण ३/११/५) Both can be explained by the fact that earth is called a big lotus in space – पद्भ्यां भूमिः-पुरुष सूक्त, यजुर्वेद (३१/१३) Last step of creation is earth, so it is foot. It is base (foot, pada) of life, so it is padma (lotus). This is the lotus coming from navel of Sun as Viṣṇu. Seen from earth, it is at focus of the apparent orbit of sun. That focus is navel (nābhi). Truṭi is 33750 parts of 1 second. It is time taken by light to cross a yojana, which may be 1000 or 1600 parts of its diameter. Examples- (1) Radius of solar system is distance travelled by light in 1 year. That was the region whose material started creation of sun, so it is Āditya. Thus is called samvatsara (year)- संवत्सरः स्वर्गा (=सौरक्षेत्र) -कारः (तैत्तिरीय ब्राह्मण २/१/५/२) वाक् (=सौरक्षेत्र) संवत्सरः (ताण्ड्य महा ब्राह्मण १०/१२/७) Within this region, devas are created-प्रजापतिः (शतपथ ब्राह्मण १/६/३/३५, १०/२/६/१, ऐतरेय ब्राह्मण १/१, १३,२८,२/१७, ४/२५ आदि) संवत्सरो वैदेवानां जन्म (शतपथ ब्राह्मण ८/७/३/२१) After samvatsara is Varuṇa region- संवत्सरो वरुणः (शतपथ ब्राह्मण ४/४/५/१८ आदि) (2) Tapah loka of Brahmā is the region which receives light (or heated) from other parts. It is Called visible universe in modern physics. ब्रह्मा तपसि (प्रतिष्ठितम्) ऐतरेय ब्राह्मण ३/६, गोपथ ब्राह्मण उत्तर३/२), तपोऽसि लोके श्रितम् । तेजसःप्रतिष्ठा। (तैत्तिरीय ब्राह्मण ३/११/१/२) (3) Vijñāna ātmā in heart region is connected up to Brahma-randhra by lanes in individual bodies. (Bṛhadāraṇyaka upaniṣad 4/4/8,9; Chhāndogya upaniṣad 8/6/1,2,5; Brahma-sūtra 4/2/17-20) From that it goes to Sun at speed of light. Ṛgveda (3/53/8) tells that this link goes and returns 6 times in a muhūrtta (48 minutes). Light travels 3 lakh kms. In 1 second. It will take 500 seconds or 8 minutes to reach. It will go and return 3 times in 8 x 6= 48 minutes. - अथ या एता हृदयस्य नाड्यः…।१। तद्यथा महापथ …आदित्यात् प्रतायन्ते … नाड़ीभ्यः प्रतायन्ते ॥२॥ …रश्मिभिरूर्ध्वमाक्रामते …॥३ ॥ (छान्दोग्यउपनिषद् ८/६/१-३) त्रिर्यद्दिवःपरिमुहूर्त्तमागात् स्वैर्मन्त्रैरनृतुपा ऋतावा (ऋक् ३/५३/८).

2-1-1-9. Pramāṇa Yojana:

Jain Astronomy by S.S. Lishk-Vidyasagar Publication, Delhi-53, Pages 28,29- 1 Pramāṇa yojana = 500 Ātmā yojana = 1000 Utsedha Yojana. Here Sun is ātmā of universe, so its diameter is ātmā-yojana. …… सूर्य आत्मा जगतस्थुषश्च (यजुर्वेद ७/४२) Each start of measure is earth, next loka is Pramā measured in Pramāṇa yojana. Lower divisions of standard earth are utsedha yojana divided into 1000 parts. मा छन्दः, तत् पृथिवी…। प्रमा छन्दः, तदन्तरिक्षम् । (मैत्रायणी संहिता २/१४/९३, काठक संहिता ३९/३९) Bhāgavata purāṇa, part 5, Viṣṇu purāṇa 2/7 etc give the following measures of 7 lokas- (1)Bhū-loka (Earth) 1000 yojana. In utsedha yojana = 1000 parts of earth. (2) Bhuvar loka-1 lakh yojanas. In earth yojanas, it is Varāha of 1000 times bigger spread. (3) Svar loka-It is solar system whose ratha size is 157 lakh yojans = 157,00,000 x 1392000 kms = about 2 light years' diameter. (4) Mahar loka is 1 crore yojana. It looks smaller than solar system of 1.57 crore size, but it is in

Pramāṇa yojana = sun diameter x 500) Thus, radius of mahar-loka =1 crore yojana = 10 7 x 500 sun diameters =6.96 x 10 15 Kms. = 735 Light years. This is a sphere of width of spiral arm of galaxy near sun. (5) Janah loka-Radius is 2 crore yojanas in unit again bigger by 500 times. Thus, it is 6.96 x 10 18 Kms. =73,500 LY. (6) Tapah loka radius is 4 times bigger in unit 500 times bigger than that of mahar-loka. Radius is 14.7 crore LY, i.e. 45.1 Mpc which is distance of local super-clusture. (7) Satya-loka is 12 crore yojanas in still 500 times bigger unit. I.e. its radius =98 billion LY. Visible world (called Bhūmi) is of 1/10 size of Puruşa, as per in Puruşa-sūkta, 1 Visible world = 9.8 billion LY. Modern estimates range from 8 to 18 billion LY.

'Yojana' occurs very frequently in the Rig-Veda and in later works as a measure of distance but there is no reference defining its real length. Later, it is reckoned at four Krośas or about nine miles. It is also calculated at 8 Krośas or 18 miles and the estimate of 2 miles is also found.
Swift and all beautiful art thou, O Surya, Maker of light; illuminating the entire radiant realm.

1.Sayana (C.1315-1387 AD) comments- "It is remembered that sun traverses 2.202 Yojanas in half a nimesa, giving light to all things even to the moon and the place, by night, for they are of a watery substance from which the rays of the sun are reflected.

2. Yojana is a yoking or harnessing that which is yoked or harnessed, a team or vehicle, or a course or path.

3. Yojana is a stage or the distance traversed in the harnessing or without unyoking.

4. One Yojana is said to comprise either 4 or 8 Krosa (a cry or shout, or the range of the voice in calling); and one Krosa (or Goruta~as far as a cow's lowing may be heard, or a bull's roar) many represent ether 1000 or 2000 dandas (a rod or staff).

5. Man is the traditional measure of all things, and one Danda represent one Pavrvas (a Man 's length). Which equal one Dhanvantara (bow-string), or Dhanu (bow) one Yojana measures either 4,00 or more likely 8,000 Dhanus.

6. Assuming that one Pavrusha is 6 ft. long then one Yojana must represent a distance of about 14.6 km. (or about 9 miles, as suggested by Monier Williams). A full range of self-consistent unit was anciently devised from the proportions of man's own frame, although their exact conversion in to modern unit is unclear.

7.The basic unit is an Angula (digit or finger) and one dhanda was perhaps originally divided in to 100 digits, although 108 is traditional value, and Aryabhatta prefers 96.

8. Assuming a 6 ft. Danda Aryabhatta's Angula is exactly ¾ inch (or about 1.9 cm).

9.It does appear that one Angula has, with one Danda or Dhanu ranging from 1.83 to 2.05 m, so that one Yojana must extend somewhere between 14.6 and 16.4 km.

10. Nimesa's means shutting the eye or winking and as an erasure of time it is a wink of the eye or a moment.

11. Kautilya's Arthashastra (C 320 BC) defines one nimesha as 1/360,000th of a day and night ~ i.e. 0.24 seconds.

Sayana thus gives the speed of light as between 267,910 and 300,940 km/secs on the currently accepted value for the raped of light being 299,792 km/sec, assuming that the true speed of light was actually known to Sayana, who presented "2,202 Yojanas in half a nimesha" as a verity. And accepting Kautilyas value for nimesha, then a perfected Yojana would be exactly 16.337.4636 m and a perfect Paaurusha or Danda. Exactly 2.0422 m in one Angula=1.89 cm, one Dhanurgraha=7.56 cm, one Dhanurmushti+15.13 cm, one Vitusti=22.69 cm, and one Hasta (cubit)=51.05 cm.

All discussion of Sayana's comments has assumed that on Yojana about 14.6 km, and his is based on the western ideal of a 6ft man.
2.Yojana (Surya Siddhanta and the great Pyramid).

2-1-2. The myths of the sun chariot

(1 Yojana= 4.4944719017 mile; 1 Yojana= 7.957753881km.;
The seven-horse chariot of the Sun is called the seven swallow Chariot
- is the length of the planning of the sun's chariot 9 thousand yojanas [71619.784929 km (length)]
- the chariot yokes 18 thousand Yojanas of the length of the planning [143239.569858 (km length)]
- axle width would say that 15 million yojanas plan [11936630.8215 km(length)]
- chariot wheel, the lever partially be captured.
- pull the chariot of seven horses. The rituals of the meter. Their names – Gayathri – Bruhathi - Ustika - Jagati – Trishtu - Anustu - Pankti

Shabdharatna karam and Shabdhartha Based on dictionaries, (Telugu dictionary):
Krosa= Ammuvetunelala / vintipattu Over / dhanvantaramu / Arrow-fall distance.
Yojana=Aamada= Bereft of courses = 4 = 4 X 2000 ammuvetunelalu / vintipattu with the / dhanvantaramu / Arrow-fall distance.

Braunyamu (Andrabharati. Com)

Yojana = 8 or 10 miles = 12.87 or 16.09 km
Dhanuvu (Bow) = 4 cubits? (Telugu dictionary) ~ (cubit = 0.45 meter) - 1.8 m
Amanda / Yojana ~ 14.4 km.? Courses = 3600 m. - 3.6 km?

Vedic hear the planning dimensions / Previously, the tiny space / light system. To Scientific Evidence Specifying dimensions as the dimensions are not fixed, is only a myth.
Defining two types known as Yojana. The different values of the two measurements, one small, one large, one where there is the yojana. The fourth part of the plan is called a krosa.
4.6 miles is the equivalent of a little yojana. In the fourth quarter, which is a little yojana krosas 60, appears to be a degree axis. equivalent to approximately 8.59 miles long yojana. Latitude is equal to the third-degree charges of 1/8 of the growth of the equator.

Giza is the largest pyramid in Egypt. It is built in accordance with the measurement jyotirmandala. Krosa the Giza pyramid is equal to the circumference of a small planning.

The question of whether the earth is around, the urban modern science, in ancient times, not knowing it was slow to say the earth is flat, there is not a right. This survey is not aware of whether there is a spherical earth yojanas cannot be matched. Bhagavatam fifth Skandha (chapter)earth measurements defined in the islands. Matches in the womb of the earth sized planets revolving cycle. If the revolving Earth it is almost flat.

Bhagavata Purana, the historical evidence is currently unavailable, overblown civilization / culture, indicating that in the ancient times. If culture is the basis of the communities in the world of ancient Measurement of space / jyotirmandala measurements cannot be matched. Found in the metrics that are consistent, powerful rituals, is not the correct standard contradiction.

Vertical = height = 1 fathom(baara) man
Baara= Man stretched out horizontally to fathom the distance between the edges of two hands = 4 cubits
The distance from the beginning to the end of the arm and finger man cubit = = 2 janalu (cubit = 1 ½ feet = 0.45 m.)
Thumbs stretched hand, Jan = = 3 until end of the rod middle finger
Four fingers of the hand, about half the width of the rod = = 3 eskulu (thumb finger width).

2-1-2-1. The formation of the dunes:

Between two islands in the oceans close to the most common sand / limestone rocks are formed by the reefs in the sea waves
Waves approaching a shoreline begin shoaling and breaking a short distance from the land as the body of water they cross grow rapidly shallower. As they break at the shoreline, the waves lose their forward momentum and a reverse current is created at the bottom as the water returns.
These current picks up sand, silt and rocks and carries it a short distance out. When the current dissipates into the larger body of water, the material is deposited. The deposit gradually rises in height until an underwater shoal or bar is formed. As the wave action and reverse currents along a straight shore are regularly perpendicular to the shore, the bar grows into a long and narrow shape, and forms parallel to the shore.

2-1-3. Physical Astronomy and Surya Siddhanta

This article is an incomplete summary of a few chapters of a Hindi book published in 2006 AD: सूर्यसिद्धांत: दृक्पक्ष एवं सौरपक्ष की गणितीय विवेचना. This page is not complete, hence no discussion.

This article aims at providing a thorough (but not verse by verse) exposition of most important topics of and problems related to Surya Siddhanta in its relation to modern physical astronomy and its true or faulty interpretations by commentators, together with its use in astrology. Concrete proofs are provided in this article concerning many cardinal problems in the field of ancient astronomy.

In ancient India 18 original theoreticians were frequently mentioned in the field of theoretical astronomy known as Siddhanta, but Varah Mihir could get tangible proofs of only five, which he mentioned in his Panch-siddhantika ('Of Five Theories'), among which Surya Siddhanta was the only theory which was complete in itself and therefore highly regarded by Varah Mihir as the most accurate among all theories about heavens.

In India, the practical formulae of Surya Siddhanta are orally preserved and are regarded as sacrosanct by traditional scholars of this field, and are never fully published, because it is believed that the practical method of using this text ought to be given only to worthy persons, who do not make a living out of it (-Manusmriti, Mahabharata). No commentator has ever published the practical methods of making actual planetary computations from ancient Surya Siddhantic formulae. These modern commentators themselves did not know these ancient formulae. The Makaranda Tables (with zero date of AD 1478) are Surya Siddhantic, made from some approximate formulae of Surya Siddhanta, which implies that Makarandacharya possessed the approximate formulae and made the tables made from those formulae, but did not made public those formulae. There is error in mean Mars of Makaranda because either Makarandacharya forgot to undertake beej-samskara (see later sections and the page on beeja corrections) in Mars, while the Surya Siddhantic commentary of Aryabhata contained beej corrections for Mars too as corroborated by Graha Laghava. The Surya Siddhantic commentary of Aryabhata was therefore the only reliable commentary of Surya Siddhanta for at least over a millennium which had any practical utility for theoreticians and almanac-makers. This was the real reason behind immense prestige accorded to Aryabhata, but this Aryabhata was different from Aryabhata I or Aryabhata II, as Al Beruni rightly believed. Unfortunately, this excellent Surya Siddhantic commentary by Aryabhata was lost during or after 16th century, and now most of people wrongly believe that this Aryabhata was the same as the author of Aryabhata. All other ancient and modern commentaries of Surya Siddhanta are useless as far as their utility for actual computations is concerned, and all of them contain incomplete formulae of making true planets, but the author of Grahalaghava (Ganesh Daivajna,1519 AD) explicitly mentions that he used the beej corrections of Aryabhata for outer planets, whose value tally with those of Surya Siddhantic tables of Makarandacharya and not with those of Aryabhatiya. This topic is discussed in the section 'Siddhantic Beej Samskaara'.
The author of Aryabhata was not a follower of Surya Siddhanta, and differs from the latter in all major practical aspects, e.g., number of revolutions per mahayuga, sizes of epicycles, sequence of corrections to be made in the mean planet to get true one, etc. Aryabhata was widely criticised by supporters of canonical astronomy in India, especially by Brahmagupta and his followers. It is

noteworthy that the philosophical and astronomical or astrological statements made by epic and puranic authors of India conform to Surya Siddhantic views. Hence, Surya Siddhanta is the sole book which can be said to constitute the bedrock of India's traditional astronomical/astrological mathematics. Other traditional text is being either incomplete or incoherent.

Recently, many governmental and non-governmental organizations in India have started publishing annual almanacs based upon a freely distributed Surya Siddhantic software (Vinay Jha, 2006). It is still claimed by many astrologers of India that predictions based upon Surya Siddhanta are absolutely perfect. In 2006, a book was published in Hindi in which all major constants of modern astronomy were mathematically deduced, by means of theorems, from Surya Siddhanta! But the author stated that Surya Siddhantic planets occupy different positions in heaven than material planets (Vinay Jha, 2006), which amounts to stating that there are at least two universes, one phenomenal universe of matter open to human senses (bhoo-loka), and the other nominal universe of gods (bhuva-loka) who are presiding deities of material planets of phenomenal world (martya-loka or the world of mortals). Surya Siddhanta is said to describe this nominal world, whose planetary deities control the destinies of creatures living in the material world. Any attempt to confuse Surya Siddhanta with the phenomenal world leads to misinterpretation of this mystic text (Surya Siddhanta is described as a secret text in its last stanza, whose knowledge is said to be equivalent to Brahma-jnana or omniscience., "rahasyam-brahma-sammitam"!). Indian astrologers used to worship Surya Siddhanta till the first half of 20th century (Pt Sudhakar Dwivedi mentions this practice in the introduction to his commentary of Surya Siddhanta), when Western scholars and modernised scholars of India started criticizing Surya Siddhanta as an outdated and inaccurate text and gradually its worth declined. None of these commentators of Surya Siddhanta possessed any knowledge of the formulae of Surya Siddhanta, yet they posed as experts of this text and wrote worthless commentaries, which fail to elucidate how to compute actual positions of Surya Siddhantic planets according to ancient methods (proofs of this fact are provided in subsequent sections).

The problem with Surya Siddhanta is that its masters preserved its practical formulae and crucial concepts as closely guarded secrets, because the text itself is ordered so. No attempt was ever made to refute the false commentaries of ignorant, because supporters of Surya Siddhanta believe that it is futile to argue in favour of a divine Non-Sensory Universe during a materialistic Kali Age. This article provides proofs showing that there were genuine scholars of Surya Siddhanta, e.g., Aryabhata the Elder (prior to the author of Aryabhatiya) in ancient India and Makarandacharya in mediaeval India. After Aryabhata, no one tried to write down any genuine commentary of Surya Siddhanta showing practical methods of computations. The lost Surya Siddhantic commentary by Aryabhata the Elder was the source of those practical manuals of almanac making in India for millennia which followed Vedic-Puranic tradition (see the section "Lost Surya Siddhantic Commentary of Aryabhata: New Lights").

Surya Siddhantic 'Sun' is stated to be a deity, only 5.5 million kilometres from Earth (physical sun is 149.6 million kms away). A deity cannot be seen by ordinary senses, argue the proponents of Surya Siddhanta. The only proof of Surya Siddhanta is astrological prediction based upon it, which are held to be perfect. Since astrology based upon modern astronomy has already accepted to be a pseudoscience by mainstream scientists, Surya Siddhantic astrology needs to be tested by scientists. Another proof of Surya Siddhanta is a series of secret theorems which show that major constants of modern astronomy can be accurately deduced from Surya Siddhantic notions and equations (see the section "Deduction of Modern Astronomical Constants from Surya Siddhanta"). Some of these Surya Siddhantic or Vedic theorems suggest solutions of many unresolved cardinal problems of modern astronomy, and therefore deserve serious attention.

The problem with western commentators is that Surya Siddhantic system has many similarities with that of Almagest, on account of which Surya Siddhanta is declared to be influenced by Almagest. But detailed investigation of Surya Siddhantic system does not support this view. There seems to be a long history of distortions through translations, which may place original Surya Siddhanta in distant prehistory. Many secret ideas of Surya Siddhanta were indirectly exported to Greece but could not be fitted into the general framework of Western astronomy and were subsequently forgotten.

The concept of Philolaus that Earth and all heavenly bodies revolve around a central fire which could never be seen since there was a counter earth between the earth and this fire was related to Puranic and Surya Siddhantic tradition of a heavenly Meru which was away from the centre of the Earth and was related to a terrestrial Mt Meru (see the section "Meru: Centre of All 14 Universes"). The idea of trepidation originated from Surya Siddhanta, in which 360° was multiplied with 30% to get 108°, which had four parts of 27° each, in both positive and negative phases. Some prehistoric translator erroneously multiplied this 27° with 30% again and deduced the maximum value of trepidation to be 8° only, which was current in Greece and Europe till 15th century AD, when modern astronomy proved that material universe does not manifest any to and for oscillation or trepidation of equinoxes at all. But Surya Siddhantic system cannot work without trepidation (= ayanamsha), and Indian astrology will die if ayanaamsha is removed. If astrology has any merit at all, it must be based upon Surya Siddhantic system, because this system has a complete and coherent system as well as a complete parallel universe of gods who regulate the destinies of living creatures. Those commentators who confuse Surya Siddhantic planets to be same as material planets observed by astronomers declare this text to be imprecise, and such commentators do not even try to test the validity of Surya Siddhantic system for astrology based upon Parashara. There are many facets of Surya Siddhantic system which were highly esteemed by ancients but are now regarded to be false notions, e.g., the idea of trepidation or of Meru as Centre of Cosmos. Therefore, no serious attempt is made to understand the original logic behind such ideas which captured their imagination for millennia. Such exotic ideas are discussed in detail in subsequent sections, and they prove to be right provided we do not judge them out of context.

Surya Siddhanta gives the locations of several stars other than the lunar nakshatras, which are not the stars of material universe according to proponents of Surya Siddhanta. Later Indian mathematicians and astronomers such as Aryabhatta and Varaha Mihira made references to this text, while later Arabic and Latin translations were very influential in the Middle East and Europe.

2-1-3-1. Dating the Surya Siddhanta: different views:

The '''Surya Siddhanta''' is one of the earliest astronomical treatises of [[India]], but the form in which it has come to us is generally believed to date after circa 400. It has rules laid down to determine the true motions of the luminaries, which do not exactly conform to the positions of material objects in the sky. It is not known who wrote the "Surya Siddhanta" or when it was first compiled. It is stated in Surya Siddhanta that it was given by the Sun-God to an Asura named Maya in 2163101 BCE. Such a date cannot be accepted by modern scholars, but we do not have definite alternatives. On the basis of concurrence of Surya Siddhantic tropical True Sun with that of modern astronomy, 782 AD is the date for such a concurrence in mean sun, and 908 AD is for true sun. Since Varah Mihir had stated around 550 AD that Surya Siddhanta was the most accurate and prominent of all theories, 800 or 900 AD cannot be the date of composition of original Surya Siddhanta. It is, therefore, proposed that 1° of error in Surya Siddhantic True Sun may place it around 400 AD. A deferent epicycle revolving around an equant is the most important Surya Siddhantic device used for accurate description of true planets, and it is same as that in Almagest. Hence Surya Siddhanta's date had to be placed subsequent to that of Ptolemy's, so that Indian astronomy could be proved to be a result of Greek teaching. No detailed examination of mathematical systems was undertaken. Equations of Surya Siddhantic true planet were a secret, and that was why modern commentators could not realize that Surya Siddhantic system was not only internally coherent but was vastly different from that of Almagest in crucial respects also. These peculiarities of Surya Siddhantic system could not have been innovations, because an internally coherent system cannot evolve as a result of haphazard patchworks of borrowings plus improvisations. Hence the causes behind superficial similarities between Surya Siddhanta and Almagest needed to be investigated more thoroughly. Important original facts had to be deliberately forgotten or distorted in order to prove posterity of Surya Siddhanta with respect to Almagest. Some of these misconceptions are examined here.

While declaring that scientific investigation into Surya Siddhantic positions of tropical Sun revealed that it was composed around 800 AD (±400 years if 1° error is assumed), it was not mentioned that other planets do not fit into this scheme. If sidereal Sun is chosen to be a criterion for dating, we get a date near about 2000 AD or 150000 BCE! Other planets give various dates, showing vast differences. There is no period in history when the discrepancy between Surya Siddhantic and scientific values of true positions of all planets fall within tolerable margins. Around 400 to 900 AD, all five planets show differences widely fluctuating between ±12°, which is too much to enable any dating based on this method. Hence, this method is highly questionable. But it has been accepted because it neatly fits into the currently believed dates for Vedic and post-Vedic history. But to accept the result a doubtful method just because it supports a premise is tantamount to prove a premise on the basis of premise itself.

The most ancient date for Indian astronomy was 1400 BCE (Colebrooke), which was supposed to be the date of original observations cited in Vedanga Jyotisha. Rigveda and Yajurveda treatises of Vedanga Jyotisha mention that Uttar Ayana (winter solstice) coincided with the simultaneous entry of Sun and Moon into Dhanishtha in the beginning of bright half of lunar month of Magha. Beginning of Dhanishtha means sidereal 293°:20', which is equal to tropical 316° now-a-days (due to +23° ayanamsha). Around 1400 BCE, sidereal 293°:20' was equivalent to tropical 270° due to -23°:20' ayanamsha. Since, tropical 270° was tropical Uttar Ayana, Colebrooke concluded that it was the date when observations were originally noted down which were later used in the treatises of Vedanga Jyotisha. To date, all scholars have used this conclusion of Colebrooke as a proven fact, and no one bothers to wonder that the beginning of bright half of lunar month of Magha, which is explicitly mentioned as a condition in original texts, was totally impossible around 1400 BCE from any system of reckoning. A comprehensive understanding of Indian astronomy was not the objective of these scholars. That is why no modern commentator even raised the question that original equations of Surya Siddhanta need to be re-discovered. They had to prove an Aryan Invasion Theory at any cost, and they proved it at the cost of facts. It was deliberately forgotten that beginning of bright half of lunar month of Magha should coincide with aforementioned event. Every almanac maker of India knows that the Kali Age began with Magha, when siddhantic sidereal Mean Sun stood at 360°. Now-a-days, an average of 60 years has shown that Magha starts when siddhantic sidereal Sun stands at 293°(Dhanishtha), which is believed to be Sidereal Uttar Ayana by Indians. Hence, in 1400 BCE, siddhantic sidereal Sun stood at 338° nearly, and tropical Sun was at 315° when Magha bright half began. But tropical Uttarayan needed tropical Sun at 270°. Colebrooke's computations showed an error of about 45° in Sun's longitude, which is not a small error. Colebrooke and his followers, therefore, decided that Indian system of reckoning should not be considered at all.

But even with modern system of reckoning, beginning of Magha cannot be proven around 1400 BCE. At the meridians of New Delhi, winter solstice (tropical Sun at 270°) occurred on 21 Dec,2000 AD at 19:06:51 PM, Julian date 2451900.067257, when Tithi (= Moon minus Sun, the result divided by 12) was equal to 26.08875 scientifically and 26.00450787 siddhantically. Same event of winter solstice took place on Jan 1,1400 BCE at 17:04 PM when Tithi was 20.11363426 scientifically and 19.7426117 siddhantically. Difference in scientific and siddhantic Tithis was 0.08424213 in 2000 AD and 0.37102256 in 1400 BCE. It is a marginal difference compared to the error of 45° in Sun's longitude at the start of Magha found in Colebrooke's reckoning, which is equivalent to an error of nearly 45.7 tithis, or of 15.7 tithis if one lunar month is subtracted!

The detailed equations of finding lunar month in distant eras is discussed in the section "Surya Siddhantic Time-Cycles and Age of Universe". These equations are not very intricate but have been neglected by Indian and Western scholars alike for centuries, because they have lost interest in deciphering the methods of the ancient astronomers. But these equations are essential for traditional almanacs of India, because observance of many religious rites demands an accurate determination of tithis for all manvantaras and yugas! A careful examination of these equations reveals an organic relationship between the Surya Siddhantic system of reckoning and the general body of Vedic-Puranic tradition, which is helpful in determining the date of composition of Surya Siddhanta as well. When we delve into intricate equations of Surya Siddhanta, we find that pre-historic astronomers of India had a highly complex and organic system of astronomy and mathematics which was forgotten during the post Christian era, especially during 1500-2000 AD. Commentators like G. Thibaut have described Paitamaha Siddhanta as an underdeveloped system, but there are tangible proofs to the contrary, shown in subsequent sections here, which these scholars neglected.

During 400-800 AD, Surya Siddhantic and Scientific positions of planets show differences amounting up to ±12°. It is inconceivable that errors of 12° went unnoticed by all ancient astronomers! The reason is different, which is deliberately neglected by all modern commentators. Surya Siddhanta explicitly states that its planets are various incarnations of God and are therefore deities. According to Surya Siddhanta, the whole material universe vanishes during the night of Brahma when Surya Siddhantic Sun (and other planets) continues moving, otherwise Brahma will not know that His night has elapsed. Hence, Surya Siddhantic planets were believed to be divine and therefore distinct from material planets. The main purpose of astronomy was predictive astrology in all ancient societies, hence actual position of material bodies in the sky was not a matter of primary concern to most of the ancient Indians. Modern commentators assume Surya Siddhantic planets to be same as material objects of the sky, and therefore deduce that Surya Siddhanta is an inaccurate text as far as physical astronomy is concerned. No detailed examination of the original scheme of Surya Siddhanta was deemed necessary. But in the light of many new facets of this mysterious text unearthed in a Hindi book (Vinay Jha,2006), dating the Surya Siddhanta needs a revaluation. If we fail to find out a definite date, we should state it explicitly and should not enforce a factious date by deliberately distorting the facts.

2-1-3-2. Old and new Versions of Surya Siddhanta:

In his famous treatise Panchsiddhaantika (Five Theories), Varah Mihira concluded that Surya Siddhanta was the most accurate and clear among all theories known to him. But in his version of Surya Siddhanta the revolutions of planets during a mahayuga of 4320000 years (known as Yuga-bhagan) does not tally with the extant version of Surya Siddhanta. This discrepancy induced European scholars to call the Panchsiddhaantic version of Surya Siddhanta as the old one, and the extant version as the modern one. This nomenclature was used by G. Thibaut, the commentator of Panchsiddhaantika. But this decision was made without any scientific investigation into the causes of this discrepancy.

The Mahayuga-bhaganmaana (revolutions per 43200000 years) of five planets in old and modern versions of Surya Siddhanta are as follows (Actual SS implies actual Surya Siddhanta which is elaborated in the section "Siddhantic Beej Samskaara"):

Revolutions per Mahayuga (Bhagans): differences of various system from extant (so-called modern) Suryasiddhaanta:

Planets	Suryasiddhanta	Suryasiddhanta	Differences	Differences	Differences
	Old	Extant	Old SS	Actual SS	Aryabhatiya
Mercury	17937000	17937060	-60	+12.58	-40
Venus	7022388	7022376	+12	- 9.43	+12
Mars	2296824	2296832	-8	+ 2.6	-8
Jupiter	364220	364220	0	- 6.29	+4
Saturn	146564	146568	-4	+ 9.43	-4

There were three methods of making almanacs (Panchangas): Siddhanta, Tantra, and Karana. In the siddhaantic method, computations were made from the beginning of Creation. 499 AD was 1955883600 years after Creation according to Surya Siddhaanta, which was equal to 452.7508 Mahayugas. A difference of 60 revolutions during one mahayuga means a difference of 452.75 * 60 = 27165.05 revolutions since Creation! Such a difference makes a mockery of everything. Hence Varah Mihir's figure cannot be related to Siddhaantic methodology, i.e., reckoning from the beginning of Creation.

In the Tantric Method (which has nothing to do with Tantra of religion or philosophy), difference of 60 revolutions during 4320000 years implies a difference of 18° during 3600 years, i.e., between the onset of Kali Age and AD 499, when trepidation or ayanamsha was zero and therefore the author of Aryabhatiya chose this year for his reference point, which was near the time of composition of Aryabhatiya. Varah Mihira is believed to have written his texts nearly five decades later. An error of 18° could not be accepted by anyone. Since the modern Surya Siddhanta is the basis of a large number of Indian almanacs, being not much removed from actual positions of material planets as well, it is the Old Surya Siddhaanta of Varah Mihir which must contain errors up to 18° in the position of planets (+18° for Mercury, -3.6° for Venus, +2.4° for Mars, zero error for Jupiter, and +1.2° for Saturn).

There is a third possibility of Karana Method, in which any neighbouring year is chosen as reference point and Yuga-bhagas are readjusted accordingly in order to facilitate the task of almanac-makers. If the Old Surya Siddhanta had a Karana reference point only a few centuries before Varah Mihira, the error in mean planets will vastly decrease. Hence, it may be argued that the Old Surya Siddhanta quoted by Varah Mihira was actually quoted from not a Sidhhanta but a Karana text. This last possibility is really significant, because it has some remote connections with actual Beej-samskaara for AD 499 as shown in the table above. Although Varah Mihira's figures show large errors in magnitude, the sign of differences is never reversed. Hence, we must conclude that Varah Mihira had access to some almanac making Karana text supposedly based upon Surya Siddhanta, which used wrong values of beej-samakaara (See the section 'Siddhantic Beej Samskaara' for further details on Beej-Samskaara, which are essential corrections in mean planets). The figures given by Varah Mihira are certainly related to some lost Surya Siddhantic Karana text, but the values are wrong, which will result in a very faulty almanac for any period. For instance, Mercury will show a beej-samskaara of +8°, while its actual beej-samskaara ought to be a little over 6° during the age of Varah Mihira. An error of 12° could not have been accepted by anyone. Had Varah Mihira possessed any idea of beej samskaara, he must have elucidated it by differentiating the Siddhantic bhagans (e.g.17937060 for Mercury) from beej samskaara (+12.6 or roughly +13 for Mercury). When he tried to find out the values of mahayuga-bhagans from some almanac making karana text, he failed to notice that Karana texts contain not the Siddhantic bhagans but beej-corrected bhagans (i.e. Corrections already made in the tables for mean planets). Varah Mihir was not an almanac maker, and therefore could not discern this nuance of traditional Indian astronomy, which has always remained a trade secret of almanac-makers. It is interesting to note in this respect that all modern Surya Siddhantic almanac makers of India are using tables made in AD 1478 (known as Makaranda Tables), because these almanac makers do not know how to update the tables, and therefore refuse to accept the views of those who actually know the secret. Hence, it is not surprising that Varah Mihir did not know this closely guarded secret and therefore gave wrong values in his treatise. No good almanac for any period can be made from the values given by Varah Mihira. Hence, it is wrong to label his version as Old Surya Siddhanta, because he did not possess any version of Surya Siddhanta at all and merely tried to get something out of karana text which he failed to understand properly. Thibaut was totally in the wrong in proposing manes like Old and Modern versions of Surya Siddhanata. He did not try to understand the actual practices of traditional almanac making. The so-called modern Surya Sidhhanta is the only version ever available, and whatever Varah Mihir quoted was not from Surya Siddhanta but from a wrong interpretation of some almanac making supposedly based upon Surya Siddhanta. (These sentences are being written by a person who is the maker of six governmental and non-governmental Surya Siddhantic almanacs in different states of India at present. Cf. Vinay Jha,2006).

The table of Mahayuga-bhagans shown above also shows the figures of Aryabhatiya, which apparently seem to be even more spurious than those of Varah Mihir, because the figures of Aryabhatiya have signs inverted in the case of all planets. The only plausible explanation behind such a blunder by Aryabhata is that he subtracted beej corrections instead of adding them to mean planets. Even if this view is accepted, the values viven in Aryabhatiya will lead to a faulty almanac, containing errors of 6° in the case of Mercury if comparison with Surya Siddhanta are made. Aryabhatiya does not show good results even if comparison with modern scientific methods are made. Moreover, the sequence of corrections made in mean planet to get true planet is wrong in Aryabhatiya, which is discussed in the section 'Corrections in Mean Planet to Make True Planet’. In this connection, the section 'Lost Surya Siddhantic Commentary of Aryabhata: New Lights ' should be viewed as well.

Many crucial aspects of Surya Siddhanta have not been thoroughly researched as yet by anyone. For instance, Surya Siddhantic equatorial radius of Earth is stated to be 800 yojanas, one yojana equalling 7.97274625 kilometres. On this basis, the distance from Girivraja (prehistoric capital of Magadha) to Mathura comes out to be 98.51 yojanas. In Mahabharata, it is stated that Mathura was 99 yojanas from Girivraja! This story of Jarasandha of Girivraja is part of the basic story of Mahabharata and cannot be brushed aside as an interpolation. Moreover, only the Surya Siddhantic value of one yojana equalling 7.97274625 kilometres satisfies the statement in Mahabharata.

During 500-600 AD, Earth's circumference was stated to be 3200 to 3300 yojanas by Aryabhata and Varah Mihira, 6600 yojana by Aryabhata II later, 4867 by Bhaskaracharya in 11th century and nearly 4000 by Ganesh of Grahalaghava in AD 1519. The implication is that the author of Mahabharata knew how to compute the diameter and other aspects of Earth, and possessed an accurate value of pi! There are, however, some sections in Mahabharata which do not form part of the main story and give such values of yojana which are incompatible with Surya Siddhanta. Such portions must be interpolations, because they are not related to the main story. Narada Purana gives a detailed explanation of mant topics of astronomy, which are in harmony with Surya Siddhantic framework. Intricate equation of determining lunar month od distant age confirms the statement of Bhagvat Gita that Margashirsha was the foremost month. Etymologically, it means "at the head of Sun's Path". Another popular ancient name of the month of Margashirsha is Agra-hayana, which etymologically means "at the start of Year". Surya Siddhantic month-equation shows that Agrahayana was the first month of Creation. If etymological meanings confirm actual meanings, they must belong to a very early period when language was itself taking shape and names of months were being worked out. The month-formula which make these computations possible are related to the so-called Metonic Cycle, which was borrowed by Greece from Babylon. But the relations of Metonic Cycle with prehistoric India when month-names were being discovered makes it clear that Metonic Cycle was known to Indian astronomers in very remote prehistoric ages. These formulae are discussed in the section " Surya Siddhantic Time-Cycles and Age of Universe".

2-1-3-3. Lost Surya Siddhanta Commentary of Aryabhatta: New Lights:

Aryabhata the elder is reputed for having written the first known commentary of Surya Siddhanta, which had been mentioned by many ancient authorities but is no longer available. The author of Aryabhatiya (of Kusumpur) is believed by many to be the same as this Surya Siddhantic commentator. The author of Aryabhatiya does not seem to accept the system of Surya Siddhanta in many crucial fields. For instance, mean motions of planets in Aryabhatiya differ widely from the so-called Old as well as Modern versions of Surya Siddhanta and the values as well as sighs of seed corrections (beej samskaara) in mean motions also differ widely. Epicycles also show differences, and the sequence of four corrections made in mean planet to get true one in different from that of Surya Siddhanta; all other theories of ancient India follow the sequence of Surya Siddhanta. Aryabhata's concept of moving Earth also keeps him apart. Hence the original commentator of Surya Siddhanta was a different Aryabhata according to some. Varaha Mihir did not clarify a major part of Surya Siddhanta or parts of Panchsiddhantika are lost. But Aryabhata was a highly respected astronomer and renowned for his commentary upon Surya Siddhanta in ancient India. The Mahasiddhanta of Aryabhata II adheres to the crucial concepts of Surya Siddhanta but differs in some significant details. Hence the commentator of Surya Siddhanta cannot be identified either with Aryabhata I or with Aryabhata II but cannot be placed in a later period because he was known to ancients. Hence, the commentator of Surya Siddhanta must have existed long before Aryabhata I (the author of Aryabhata): this is the view of Al Beruni and some others. But careful examination of Aryabhatiya proves that it is merely an Audiyika version of Ardharaatrika Suryasiddhanta, but details of this intricate Karana techniques cannot have explained here due to its intricacy and details.

Grahalaghava of Ganesh Daivajna was written around AD 1519, and in it Ganesh says that his mean Mars, Jupiter and Saturn are based upon those of Aryabhata. Actual computations show that the mean positions of Mars, Jupiter and Saturn according to Grahalaghava for different periods broadly conform to those of Surya Siddhanta of Makarandacharya (except in the case of Mars, in which Makarandacharya forgot beej corrections but Aryabhata the Elder did not err). Mean motions of Aryabhata I or Aryabhata II do not conform to those of Grahalaghava. Hence, the author of Grahalaghava was certainly referring to the Surya Siddhantic Aryabhata, whose commentary was extant around AD 1519. Grahalaghava is among the most popular treatise from which traditional almanacs are still being made in a large part of India, and the statement of its author carries much weight.

2-1-3-4. Deduction of modern Astronomical constants from Surya Siddhanta:

Kamlakara Bhatt (author of Siddhant-tattva-viveka, as yet untranslated), an ardent supporter of Surya Siddhanta and an opponent of Bhaskara II, had strongly advocated in 16th century that Surya Siddhantic planets are to be distinguished from the material planets. In the beginning of 20th century, terms like Drik-paksha and Saur-paksha came into vogue in India, to distinguish planets and phenomena of Sensory World from that of Surya Siddhanta. Drik-paksha meant the world perceived by means of sense organs, and therefore it denoted the field of modern astronomy, while Saurpaksha denoted the gods of Next World bearing the same name as the material planets but being non-material. Ketaki system of almanac used these concepts in actual practice. But the Surya Siddhantic viewpoint of Drikpaksha was never elaborated by anyone. Unfortunately, after the

disappearance of the Surya Siddhantic commentary of Aryabhata the Elder, even the Saurpakshiya mathematics became obscure, and all the commentators kept on repeating hackneyed phrases whose practical significance was clear to none. Ranganath, Kamlakar Bhat, Sudhakar Dwivedi, Kapileshwar Shashtri, etc. wrote voluminous commentaries on Surya Siddhanta, elucidating everything except the practical ways of using the formulas and the Meru centric geometrics.
Let us examine some orally transmitted occult theorems of Surya Siddhantic school which show that Drikpaksha can be deduced from Saurpaksha mathematically, without the aid of any observatory (Vinay Jha,2006).

Theorem of Drikpakshiya Sidereal and Tropical Years and of Processional Period.
Saurpakshiya eccentricity of Sun's elliptic orbit around the centre of Cosmos (Mt Meru) is exactly equal to 1/60 (= ε), although saurpakshiya equation of centre requires an equant, which will be elaborated in the section 'The True Places of Surya Siddhantic Planets'. Let us denote 1/60 by ε and 'pi' by π. Then,

(1). Ys′=[1π2∗ε2+12(1+ε2)] =[3600π2+0.5+17200]
=365.25640000130486608685495644391days.

This is the limiting value of scientific sidereal year by means of Vedic (i.e., Surya Siddhantic) equation. The Vedic (i.e., Surya Siddhantic) theorem of scientific Tropical Year Yt (=365.24219878125) will be demonstrated later, let us first get the value of mean sidereal year with the help of following equation:

(2). Ys=(Ys′+1) (1+1Yt)
=366.2564000013048660868551+1365.24219878125=365.256361225816672416892590032526
68days
Now we can get the Period of Precession PP:

(3). PP=Yt(Ys−Yt) =25789.488323276570161593347095778years
This mean value needs two complex corrections which are too intricate to be shown here. Let us deduce the value of scientific Tropical Year first. We will not explain all the intermediate terms here, which can be easily recognized by students of modern astronomy.
Let sidereal lunar month be equal to:

Mss = 27. 321660641391789747802454274321 days, which will be proven later. Then, synodic month Ms will be:

(4). Ms=Ys(YsMss−1) =29.53058780664716371374days.
Metonic Year Ym is equal to:

(5). Ym=235Ms19=365.246743924320182775185653635days
Processional Period due to Moon's effect (PPM1):

(6). PPM1=1(YsYm)−) =37978.09022183997109169737years
Processional Period due to Sun's effect (PPS1), intermediate term:

(7). PPS1=11PP−1PPM1=80356.674413324332490977057144470years
Processional Period due to Sun's effect from alternative equation (PPS2), intermediate term:

(8). PPS2=1Ys(1Yt−1Ym) =80356.674413324332490977057250561years
The difference between PPS1 and PPS2 is due to computer's errors and is equal to a negligible quantity:

(9). Difference=1.320251252∗10−27years
Intermediate terms are:
A1 = PPS1 / PPM1 = 2.1158692799964388041303958720096.
A2 = PPS2 / PPM1 = 2.1158692799964388041303958748028.
Processional Period due to Sun's effect (PPS), final value:
PPS = PPS1 + A1 = 80358.790282604328929781187540342
PPS = PPS2 + A2 = 80358.790282604328929781187646436
There is a difference in two values of solar processional period shown above (PPS) in 27th digit only. Hence, the computations are highly reliable.
There are three equations for obtaining scientific Tropical Year (in days):

(10). Yt.1=Ym1+1(PPS1+A1) =365.24219878124999999999999999638527125.

(11). Yt.2=YmPPS=365.24219878124999999999999999638595267.

(12).Yt.3=Ym1+1(PPS2+A2) =365.242198781249999999999999999999972349
Drikpakshiya Tropical Year is the most precise constant known to modern astronomy, whose empirical value is 365.24219878125 ± 0.00000000058 days.

The error of ± 0.00000000058 days is due to errors in modern instruments. The three values we obtained above through Vedic equations have errors in 34th digit which is due to 34-digit precision of Windows Calculator used to obtain above results. The net result is startling: value of 'pi' is the basic term used to deduce the exact value of most important astronomical constants, if you know the exact value of 'pi' then you can deduce the exact value of astronomical constants. Modern physicists know many such equations, which are called "coincidences" by atheists, and as proofs of Intelligent Design of Universe by believers in God.
Vedic (i.e., Surya Siddhantic) Theorem of Lunar month

M1 = 365.256400001304866086855 / (42/π) = 27.321114831446531255657
K1 = M1 / (Mss - M1) = 50056.095658915529
K2 = 42000(Ys-Yt) = 594.8226718002415
Now raise (Ys/360) to the power (1/K2):
Z1 = (Ys/360)^(1/K2) = 1.014601^(1/594.82267) = 1.000024369635568 degrees.
K3 = 1-[(180/π)* {(Sin(Z1+1)-Sin(Z1)}]
= 1-[57.296*{(Sin(2.000024369635568)-Sin(1.000024369635568)}]
= 0.00035537415305595585466208556289 39
K4 = K3 * 1000000 = 355.37415305595585466208556289 39
K5 = 1+(1/K1)
Now we get the value of Drikpakshiya synodical or lunar month :

Ms = [(K4 / K5)-1}/12 = 29.53058780664716371373841555 days.
Sidereal lunar month will be :
Mss = Ys / [(Ys/Ms)+1] = 27.321660641391789747802454274321
Now we show some more intricate Vedic (Suryasiddhantic) theorems. First of all, let us see:
Lunar Binomial Theorem:
A1 = 12/(K4-1) = 1 / 29.5311794213296538
A2 = Ys / 365.256400001304866086855.

(13) $A = A1 * A2 * (42\pi) = 0.45270842758190827172$
Here is the Lunar Binomial Equation:

(14) $(A * M2) + M - Ys = 0$
Roots of this binomial are:
M1 = [-1 + Sqr(1-(4A*Ys)] / 2A = -29.5305886713712313156 days.
M2 = [-1 - Sqr(1-(4A*Ys)] / 2A = +27.3216613815891770963 days.
M2 - Mss = 0.063953054266910187950698752 seconds.
This apparent 'error' is equivalent to the error of 104.643228673117 years in 4.1748 billion years (= 14 manavantara of 71 Mahayugas each, each Drikpakshiya mahayuga being of 4.2 million years). This is the value of Drikpakshiya correction in Kalpa-Mandochcha, for which Bhaskaracharya deduced the value 93 in Siddhantashiromani and stated Kalpa-Mandochcha to be equal to 480 (= Saurpakshiya Kalpa Mandochcha 387 + 93 Drikpakshiya correction). Its elucidation will be shown later.

Surya Siddhanta states Saurpakshiya period of precession to be of 24000 years exactly, while modern value is near the Drikpakshiya value of PP deduced above (= 25789.4883233 years). Let us see its logic.
1/K' = (1/24000) - (1/25789.4883233) = 1/ 345879.71975438125
Mt = Mss - (Mss/K') = 27.32158164959469683453 days.
This constant Mt is the modern value of tropical sidereal lunar month!

12.Exact differential equation of Mean Moon of modern physics from Suryasiddhanta:
Here is NC Lahiri's formula of Mean Moon published by him in Bengali book "Panchaanga Darpana". Latest equations do not differ significantly.

(15). $NirayanaMeanMoon = 261{:}10'{:}1.24'' + (17325593.8031'' * T) + (6.03'' * t2) + (0.0067'' * t3)$
where T = Julian years of 365.25 days,
t = Julian centuries of 36525 days
261:10':1.24" is Mean Moon on Zero date of 1900 AD (Greenwich Noon 31 Dec 31, 1899)
Here is my Siddhaantic Drik formula of Nirayana Mean Moon on the same pattern, published in Hindi in 2005 Shivraatri, built from purely Suryasiddhaantic terms using Taylor's and Lagrange's formulas of modern differential calculus (setting up an empirically correct planetary differential equation is most difficult part of modern astronomy or higher mathematics):

(16). $NirayanaMeanMoon = 261{:}10'{:}1.24'' + (17325593.803064287678'' * T)$
(17). $+100 * 6.0337456626113312731046134872458'' * t2$
(18). $+10-3 * 6.5095055710038624734367'' * t3$

(19). +10−6∗4.681852716188407032"∗t4
(20). +10−9∗2.525508037859365516483207"∗t5
(21). +10−12∗1.089857581762611529246014535145"∗t6
(22). +10−15∗0.39193089427273663825034568365639"∗t7
(23). +10−18∗0.12080988126146805887553801248113"∗t8
(24). +10−21∗0.03258393040897135345673870555868"∗t9
(25). +10−24∗0.0078118151691312247782389032276435"∗t10+......

This explanation of this theorem is very long, which was published in my Hindi book in 2006 AD. It will soon be translated into English to be uploaded here.

2-1-3-5. Surya Siddhanta theory of the rotation of material Universe:

Surya Siddhantic universe is much smaller in comparison to material universe, and Sun's distance from Earth is only 861.7 times of Earth's equatorial radius. Material Sun's distance is 23455 times of Earth's equatorial radius! Ptolemy used a figure 1210, which is not much removed from Surya Siddhantic figure. Ptolemaic system is well known, but Surya Siddhantic system is rather obscure, known to a few initiated Brahmana’s only. Due to lack of knowledge of orally transmitted and unpublished portions of original Surya Siddhanta, European commentators believe that Surya Siddhantic system was influenced by Ptolemy's Almagest. But those who know the secrets of Surya Siddhanta say that its framework is too complex and organically self-constrained to have been influenced by any other system. For instance, Surya Siddhantic daily motions of all planets are exactly equal to a constant, but this rule is not followed in Almagest. Surya Siddhantic system is based upon a cosmic centre at Meru, which is absent in Almagest. Surya Siddhantic solar epicycle is equal to 14 yojanas per degree, which is equal to 5040 yojanas for 360 degrees. Its diameter is 1604.3 yojanas, which is 4.3 yojanas more than Earth's equatorial diameter. 4.3 yojanas equals 5.199 kilometres (height of Mt Meru or Mt Kenya) plus 28.913 kilometres. Solar epicycle equals to 14 yojanas, which gets reduced to 13:40 at perigee of this elliptical epicycle, which when divided by 2π gives 2:10:31 degrees, which is the maximum value of equation of centre (Mandaphala = difference between mean and true Sun) for Sun. Surya Siddhantic theory, therefore relates yojana to degrees in an intrinsic manner, which makes it clear that it was not borrowed from Almagest. Earth's diameter is an integer 1600 yojana. Moon's diameter is also an integer 436 yojanas. These rations are perfectly scientific. Such integral values seem to be mysterious when they are confirmed with modern science. This value of yojana was not only prehistoric, manifest in the story of Jarasandha's 99 yojanas cited above but was also intrinsically related to many native concepts of Surya Siddhanta, discussed in other sections of this article.

2-1-4. Ancient Cosmogony and Geography

Surya Siddhantic system is neither is located heliocentric nor geocentric. It clearly states in Bhoogoladhyaya that Mt Meru resides at the center (equator) of globe in the region of jambudweep. In Africa, Mt Kenya is situated upon equator in a region where many modern place names are reminiscent of Surya Siddhanta: Meru town near Mt Kenya, another Mt Meru slightly southwards, a place named kinyan-giri which means Mt Kinyan or Mt Kenya in Sanskrit, river Zamboonadi > *zamboodi > *zambedi > *zambezi, Mu-zambique, Zambia, Zimb-abwe, Gabon (< *Zamboon), Congo (< *Gongo < *zambo), etc. Homo genus of mankind is known to have

evolved in that region around 4 million years ago. Indian Puranic tradition also mention that modern races of mankind evolved near Meru in 3891194 BCE when the present Mahayuga commenced. Surya Siddhantic formulae of making true planets from mean ones require the use of distance from Earth's center to a point in space 28.913 kilometers above the top of Mt Meru (Mt Kenya), which was believed to be center of all universes by puranic authors.
Siddhanta Darpana.

Siddhanta Siromani - Circumference = 4,800 yojana (This is followed by Siddhanta Darpana also) Thus, yojana is 5 miles according to Siddhanta Shiromani and 7.52 miles according to Aryabhata. Anuyogadvara Sutra (Jain) gives.

1 Atma yojana = 7,68,000 angula = 9-1/11 miles estimated according to current measurements of earth. Dr. L.C. Jain opines that 1 Pramana yojana is 500 Atma yojana = 4,5 45.45 miles. M.B. Panta opines that 5 yojana (40 or 45.5 miles) was called Mahayojana used for measuring distances of stars. For example, 'Trisanku' star is named on basis of its distance from earth.

Tri-Sanku = 3 x 10 13 Mahayojana = 207 light years. This is actually the distance of that star now known as Beta-cruces in Southern cross constellation.

Similarly, it is said that Agastya had crossed Varidhi (10 14) or drunk ocean and had gone south. It is now known as 'Argo-Navis' star at 80° 5' south latitude, indicating naval journey. This star is 652 light years away; 10 14 maha yojan is about 690 light years.

2-1-4-1. Jyothi Siddhanta Yojana Measurement:

The globe is totally 360° as per science, mathematical, but the Joythi Siddhanta is million years back measurements to earth is 21600 Kalas, each Kalas equal one degree. Now science is time calculated Greenwich time, but the million years ago Lanka is merriments time and which desha which Varsa is there and previous Sapta Sagharas and Sapata Dweepas, Nava Varshas, now nine continentals, five oceans is in globe.

“Paramanuvu Adhorenuhu Keshayuka Tila Yana
Karmadashta Gunita manangula Mudha Harutham” [Jyothi Shastra Shloka].

A Yojana is a much-disputed distance, as the concept of Yojana for some reason has lost its continuity very early in our civilization.
Yojana simply means a distance that can be travelled by an object in one run (a phase or stage) or travelled without stopping or travel ‘in a line’. Thus, Yojana by definition is a ‘relative’ distance and not an absolute distance. The Yojana baseline varies based on the object measured.

This principle is used in modern satellites where Satellites go around the earth with a velocity of 8000 meter per second or more. Earth’s gravitational pull attracts them, but since the earth curves every second for them they keep going around the earth rather than falling onto earth.

Surya Siddhanta says that the Earth’s diameter is 1600 Yojanas, which is 12800 km. Modern estimates are 12740 km.

The Yojana for Sun's surface measurements – Bha Yojana
The core of a Sun is 27 times that of Earth. Hence a Yojana in Sun would mean 27 times the Yojana of Earth. This comes to 216km as a Yojana, when it comes to measuring distances of Sun's surface. This is called the Bha Yojana. (Bha means one that shines)
Surya Siddhanta says Sun's diameter is 6500 Yojanas, which is 1.4 million km (6500*216) approx. Modern estimates are the same.

The Yojana for distances between Earth and Sun – Bha Yojana
Surya Siddhanta also says that the Orbital Circumference of Sun's movement (earth around the sun) is 4.33 million Yojanas (216km a Yojana as above which means 953 million kilometers) whose orbital radius roughly translates to 149 million kilometers. Indeed, the average Earth-Sun distance is 150 million kilometers.

The reason for using the Bha Yojana is simply that of the two measures involved, Bha Yojana is the greater one.
The Yojana for speed of Surya Jyoti – Bhu Yojana
The fourth verse of the Rigveda hymn 1:50 (50th hymn in book 1 of Rigveda) states
"*taraNir vishvadarshato jyotishkrdasi surya vishvamaa bhaasirochanam"*
which means "Swift and beautiful, O Surya, maker of the light, Illuminating the Universe".
Commenting on this verse in his Rigveda commentary, Sayana who was a minister in the court of the great Vijayanagar Empire wrote.

"*tatha ca smaryate yojananam sahasre dve dve sate dve ca yojane*
ekena nimishardhena kramaman"

which means "It is remembered here that Sun (light) traverses 2,202 yojanas in half a nimeSa"
This has been variously discussed by many people in many places. I interpret it this way.
Unmesa and Nimesa are two aspects of blinking of eyes. Nimesa is closing of eye-lids and Unmesa is opening of eye-lids. Closing of eye-lids, Nimesa, takes 50-120 milliseconds, according to modern science. Total blinking of eye takes 400-750 milliseconds as opening of eye-lids (Unmesa) takes longer time.
Hence, I map Nimesa close to 120 milliseconds. Half-a-nimesa is 60 milliseconds in which sun travels 2202 yojanas. The Yojana used here is the Nara Yojana or Bhu Yojana, but not the Bha Yojana, as it is about sunlight reaching us or earth, and not Sun itself.

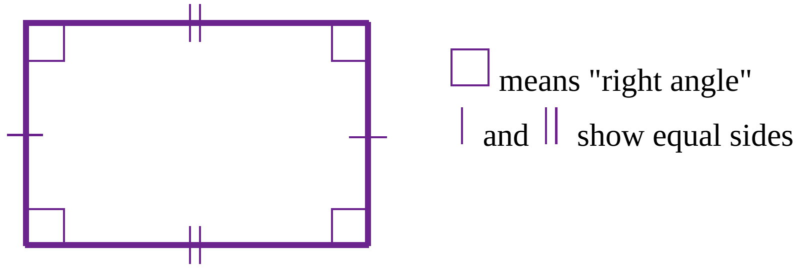
Using Bhu Yojana, 2202 yojanas become 17616km. This translates to 293000 km per second which is close to speed of light.
The Yojanas for Surya Loka
Garuda Purana talks about 88000 Yojanas for Yama Loka and 100,000 Yojanas for extent of Surya Loka.
This Yojana is not about the Sun's surface or distance between Sun and Earth. It is the extent to which the Surya Loka is spread. The Yojana used here is the Atma Yojana. Atma for us is the Surya and the Atma of Sun is its Core.
The radius of the core of Sun is the distance of Atma Yojana, which is around 150000 kms. The radius of the core is the distance to the Atma (Center) of Atma (Outside of Core).

Thus, Surya Loka has a radius of 150000*100000 km. The distance between Sun and Earth is 1000 Atma Yojanas, which is 150 million km. This is approximately the modern estimate too and is called one AU. The Solar system according to modern estimates spans 100 AU, which is same as what Garuda Purana says.
Yama Loka of Solar System – Helios heath

At distance of 80-100 AU from sun, modern science calls this region, Helios heath. Garuda Purna calls the region from 88 AU as Yama Loka or the world of Controller. This comes just after a turbulent region called ‘termination shock’, where the solar winds meet the interstellar winds and create a shock wave. The Helios heath is also a turbulent region.
Look for other relevant definitions:
Searches found 50 related definition(s) that might help you understand this better. Below you will find the 15 most relevant articles:
· Aṅgula: aṅgula: (nt.) an inch; a finger-breadth. (adj.), (in cpds:) measuring so many i... 5 desc.
· Panca: Panca means five.4 desc.
· Panca Sutta: See Anattalakkhana Sutta. S.iii.66. 2 desc.
· Pañca ābādha: Pañca, (adj-num) (Ved, pañca, Idg*penqǔe; cp, Gr. pέnte, Lat, quīnque, Goth, fimf, Lith...1 desc.
· Dhanu: dhanu: (nt.) a bow.4 desc.
· Vitasti: Vitasti (वितस्ति): A unit of measurement of distance, according to the Vayu P...2 desc.
· Pradesha: Spatial unit; Space unit; A spatial unit or space point (pradesha) is the...3 desc.
· Gavyūti Gavyūti: ancient Hindu unit of measurement of distance. 2000 Dhanus make 1 Ga...2 desc.
· Addha: addha: (m.) a half. || aḍḍha (adj.) 1. opulent; wealthy. (m.) a half. addhā (in...2 desc.
· Hasta:1) Hasta (hand), a Sanskrit word meaning hand gesture or position 2) Hast...5 desc.
· Ratni: Aṅgula; ancient Hindu unit of measurement of distance. 21 Aṅgulas make a sing...2 desc.
· Kiṣku: Kiṣku; ancient Hindu unit of measurement of distance. 2 Ratnis or 42 Aṅgulas ...2 desc.
· Yojanika: yojanika: (adj.) having a yojana in extent…2 desc.
· Nagara: The name of King Maddas capital (?) J.v.310.6 desc.
· Kheṭa: kheṭa: (nt.) a shield.3 desc.

5-1-5. Rectangle area, perimeter and prism formulas

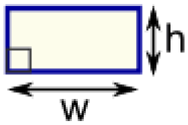
Rectangle Area, Perimeter and rectangular prism formulas
(Jump to Area a Rectangle or Perimeter of a Rectangle)
A rectangle is a four-sided flat shape where every angle is a Right angle (90˚).



→ Each internal angle is 90°

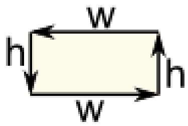
→ Opposite sides are parallel and of equal length (so it is a (Parallelogram).

Play with a rectangle:
Angles Sides Digs Reset
Area of a rectangle



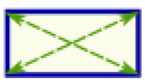
The Area is the width times the height:
Area = w × h

Perimeter of Rectangle
The Perimeter is the distance around the edges.

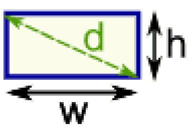


The Perimeter is 2 times the (width + height):
Perimeter = 2(w + h)

Diagonals of a Rectangle



A rectangle has two diagonals; they are equal in length and intersect in the middle.

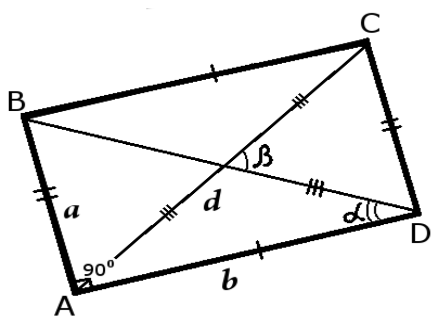


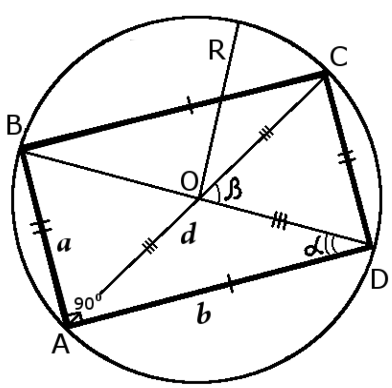
The Diagonal is the square root of (width squared + height squared):
Diagonal "d" = √ (w2 + h2)

Formulas for a rectangular prism:
Volume of Rectangular Prism:
V = l w h
Surface Area of Rectangular Prism:
S = 2(l w + l h + w h)
Space Diagonal of Rectangular Prism: (similar to the distance between 2 points)
d = √ (l2 + w2 + h2)
A cube is a special case where l = w = h. So, you can find the volume of a cube or surface area of a cube by setting these values equal to each other.
Calculations for a rectangular prism:
1. Given the length, width and height find the volume, surface area and diagonal of a rectangular prism
h, l and w are known; find V, S and d
V = l w h
S = 2(l w + l h + w h)
d = √ (l2 + w2 + h2)
2. Given the surface area, length and width find the height, volume and diagonal of a rectangular prism
S, l and w are known; find h, V and d
h = (S - 2lw) / (2l + 2w)

V = l w h
d = √ (l2 + w2 + h2)
3. Given the volume, length and width find the height, surface area, and diagonal of a rectangular prism
V, l and w are known; find h, S and d
h = V / l w
S = 2(l w + l h + w h)
d = √ (l2 + w2 + h2)
4. Given the diagonal, length and width find the height, volume and surface area of a rectangular prism
d, l and w are known; find h, V and S
h = √ (d2 - l2 - w2)
V = l w h
S = 2(l w + l h + w h)

Rectangle. Formulas and Properties of a Rectangle





The basic properties of a rectangle
Rectangle can be a parallelogram, rhombus or square in which all the angles right.
1. Opposite sides of the rectangle are the same length, i.e. they are equal:
AB = CD, BC = AD
2. Opposite sides of the rectangle are parallel:
AB||CD, BC||AD
3. Adjacent sides of the rectangle are always perpendicular:

AB ⊥ BC, BC ⊥ CD, CD ⊥ AD, AD ⊥ AB
4. All four angles of the rectangle are right:
∠ABC = ∠BCD = ∠CDA = ∠DAB = 90°
5. The sum of the angles of a rectangle is equal to 360 degrees:
∠ABC + ∠BCD + ∠CDA + ∠DAB = 360°
6. Diagonals of the rectangle are equal:
AC = BD
7. The sum of the squares two diagonals is equal to the sum of the squares of the sides:
2d2 = 2a2 + 2b2
8. Each diagonal divides the rectangle into two equal shape, namely a right triangle.
9. A diagonal of a rectangle in half divides each other:

$$AO = BO = CO = DO = \frac{d}{2}$$

10. Intersection point of the diagonals is called the center of the rectangle and also a center of the circumcircle (in center).
11. Diagonal of a rectangle is the diameter of the circumcircle.
12. Around the rectangle can always describe a circle, because the sum of the opposite angles is 180 degrees:
∠ABC = ∠CDA = 180° ∠BCD = ∠DAB = 180°
13. In rectangle with the different size of sides never enter the in circle.
A rectangle sides
Definition.
The length of rectangle is called the length of the longer pair of its sides. The width of rectangle is called the length of the shorter pair of its sides.
A rectangle sides formula:
1. Formula of rectangle sides in terms of diagonal and another rectangle side:
a = √d2 - b2
b = √d2 - a2
2. Formula of rectangle sides in terms of area and another rectangle side:

$$a = \frac{A}{b}$$

$$b = \frac{A}{a}$$

3. Formula of rectangle sides in terms of perimeter and another rectangle side:

$$a = \frac{P - 2b}{2}$$

$$b = \frac{P - 2a}{2}$$

4. Formula of rectangle sides in terms of diagonal and angle α:
a = d sinα
b = d cosα
5. Formula of rectangle sides in terms of diagonal and angle β:

$$a = d \sin \frac{\beta}{2}$$

$$b = d \cos \frac{\beta}{2}$$

The diagonal of a rectangle

Definition.

The diagonal of a rectangle is any segment that connects two opposites of a rectangle.

Diagonal of a rectangle formulas:

1. Formula of rectangle diagonal in terms of rectangle sides (by the Pythagorean theorem):

$d = \sqrt{}a2 + b2$

2. Formula of rectangle diagonal in terms of square and rectangle side:

$$d = \frac{\sqrt{}A2 + a4}{a} = \frac{\sqrt{}A2 + b4}{b}$$

3. Formula of rectangle diagonal in terms of perimeter and rectangle side:

$$d = \frac{\sqrt{}P2 - 4Pa + 8a2}{2} = \frac{\sqrt{}P2 - 4Pb + 8b2}{2}$$

4. Formula of rectangle diagonal in terms of radius of circle (ex; circle):

$d = 2R$

5. Formula of rectangle diagonal in terms of diameter of circle (ex; circle):

$d = Dc$

6. Formula of rectangle diagonal in terms of sine of the angle that adjacent to the diagonal and the opposite side of the angle:

$$d = \frac{a}{\sin \alpha}$$

7. Formula of rectangle diagonal in terms of cosine of the angle that adjacent to the diagonal and the adjacent side of the angle:

$$d = \frac{b}{\cos \alpha}$$

8. Formula of rectangle diagonal in terms of sine of the acute angle between the diagonals and the area of a rectangle:

$d = \sqrt{}2A: \sin \beta$

The perimeter of a rectangle

Definition.

The perimeter of a rectangle is the sum of the lengths of all rectangle sides.

Perimeter of a rectangle formulas

1. Formula of rectangle perimeter in terms of rectangle sides:

$P = 2a + 2b$

$P = 2(a + b)$

2. Formula of rectangle perimeter in terms of area and rectangle side:

$$P = \frac{2A + 2a2}{a} = \frac{2A + 2b2}{b}$$

3. Formula of rectangle perimeter in terms of diagonal and rectangle side:
P = 2(a + √d2 - a2) = 2(b + √d2 - b2)
4. Formula of rectangle perimeter in terms of radius of circle (ex; circle) and rectangle side:
P = 2(a + √4R2 - a2) = 2(b + √4R2 - b2)
5. Formula of rectangle perimeter in terms of diameter of circle (ex; circle) and rectangle side:
P = 2(a + √Dc2 - a2) = 2(b + √Dc2 - b2)

The area of a rectangle

Definition.

The area of a rectangle the space is restricted rectangle sides or within the perimeter of a rectangle.

Area of a rectangle formulas

1. Formula of rectangle area in terms of rectangle sides:
A = a · b
2. Formula of rectangle area in terms of perimeter and rectangle side:

$$A = \frac{Pa - 2a2}{2} = \frac{Pb - 2b2}{2}$$

3. Formula of rectangle area in terms of diagonal and rectangle side:
A = a√d2 - a2 = b√d2 - b2
4. Formula of rectangle area in terms of sine of the acute angle between the diagonals and the diagonal of a rectangle:

$$A = \frac{d2 \cdot \sin \beta}{2}$$

5. Formula of rectangle area in terms of radius of circle (ex; circle) and rectangle side:
A = a√4R2 - a2 = b√4R2 - b2
6. Formula of rectangle area in terms of diameter of circle (ex; circle) and rectangle side:
A = a√Dc2 - a2 = b√Dc2 - b2

The circumscribed circle of a rectangle (circumcircle)

Definition.

The circumscribed circle of a rectangle (circumcircle) circle which passes only four vertexes of the angle and has a center at the intersection of the diagonals of the rectangle.

Radius of a rectangle formulas:

1. Formula of rectangle circumscribed radius in terms of rectangle sides:

$$R = \frac{\sqrt{a2 + b2}}{2}$$

2. Formula of rectangle circumscribed radius in terms of perimeter and rectangle side:

$$R = \frac{\sqrt{P2 - 4Pa + 8a2}}{4} = \frac{\sqrt{P2 - 4Pb + 8b2}}{4}$$

3. Formula of rectangle circumscribed radius in terms of area and rectangle side:

$$R = \frac{\sqrt{AS2 + a4}}{2a} = \frac{\sqrt{S2 + b4}}{2b}$$

4. Formula of rectangle circumscribed radius in terms of diagonal:

$$R = \frac{d}{2}$$

5. Formula of rectangle circumscribed radius in terms of diameter of the escribed circle (ex; circle):

$$R = \frac{Dc}{2}$$

6. Formula of rectangle circumscribed radius in terms of sine of the angle that adjacent to the diagonal and the opposite side of the angle:

$$R = \frac{a}{2\sin\alpha}$$

7. Formula of rectangle circumscribed radius in terms of cosine of the angle that adjacent to the diagonal and the adjacent side of the angle:

$$R = \frac{b}{2\cos\alpha}$$

8. Formula of rectangle circumscribed radius in terms of sine of the acute angle between the diagonals and the area of a rectangle:

$$R = \frac{\sqrt{2A : \sin\beta}}{2}$$

An angle between the diagonal and rectangle side

An angle between the diagonal and rectangle side formulas

1. Formula of angle between the diagonal and rectangle side in terms of diagonal and rectangle side:

$$\sin\alpha = \frac{a}{d}$$

$$\cos\alpha = \frac{b}{d}$$

2. Formula of angle between the diagonal and rectangle side in terms of angle between the diagonals:

$$\alpha = \frac{\beta}{2}$$

An angle between the rectangle diagonals

An angle between the rectangle diagonals formulas:

1. Formula of angle between the rectangle diagonals in terms of angle between the diagonal and rectangle side:

$\beta = 2\alpha$

2. Formula of angle between the rectangle diagonals in terms of area and rectangle diagonal:

$$\sin\beta = \frac{2A}{d2}$$

PART-2

2-2-1. Physical measurements table of Sethu (the great ridge, City of Lanka, Sri Lanka (Simhala) and City of Ayodhya.

2-2-1-1. Physical measurements of Sethu or Varadhai (the great bridge) measurements:

One yojana is equal to=7.957753881kms/4.944719017 miles (as per Surya Siddhanta)
Sethu length=100 yojanas of converted into miles =494.4719017 miles
Sethu width=10 yojanas of converted into miles =49.44719017 miles

Units	Length	Width	Height	Diagonal	Surface Area	Volume
Miles	494.4719017	49.44719017	22.4759955	497.446134	24450.246157081 2	549543.6218

Rectangle Area

Unit	Rectangle Area
	S = l × w
	= 24 450.2461571
centimeter²	6.332584684 × 10+14
foot²	681 633 742 466
inch²	9.815525892 × 10+13
kilometer²	63 325.8468417
meter²	63 325 846 841.7
mile²	24 450.2461571
millimeter²	6.332584684 × 10+16

2-2-1-2. Physical measurements of City of Lanka:

One yojana is equal to=7.957753881kms/4.944719017 miles (as per Surya Siddhanta)
City of Lanka length=100 yojanas of converted into miles =494.4719017 miles
City of Lanka width=30 yojanas of converted into miles =148.34157051 miles

Units	Length	Width	Height	Diagonal	Surface Area	Volume
Miles	494.4719017	148.3415705	114.052119	528.69232	73 350.7384712 miles2	8365807.14 miles3

Rectangle Area

Unit	Rectangle Area S = l × w = 73 350.7384712
centimeter²	1.899775405 × 10+15
foot²	2.044901227 × 10+12
inch²	2.944657767 × 10+14
kilometer²	189 977.540525
meter²	189 977 540 525
mile²	73 350.7384712
millimeter²	1.899775405 × 10+17

2-2-1-3. Physical measurements of Sri Lanka (Simhala):

City of Lanka length= 268 miles
City of Lanka width= 45.7641278 miles

Units	Length	Width	Height	Diagonal	Surface Area	Volume
Miles	268	139	45.7641278	305.3512	37252 m2	1704805.29 m3

Rectangle Area

Unit	Rectangle Area S = l × w== 37 252
centimeter²	9.648223709 × 10+14
foot²	1.038526157 × 10+12
inch²	1.495477666 × 10+14
kilometer²	96 482.2370862
meter²	96 482 237 086.2
mile²	37 252
millimeter²	9.648223709 × 10+16

2-2-1-4. Physical measurements of City of Ayodhya:

One yojana is equal to=7.957753881kms/4.944719017 miles (as per Surya Siddhanta)
Ayodhya length=12 yojanas of converted into miles =59.336531004 miles
Ayodhya width=3 yojanas of converted into miles =14.834132751 miles.

Units	Length	Width	Height	Diagonal	Surface Area	Volume
Miles	59.336531	14.83413275	5.93365	61.4498	880.205977897 mile2	5222.84 mile3

Rectangle Area

Unit	Rectangle Area
	S = l × w
	= 880.205977897
centimeter²	2.279723017 × 10+13
foot²	24 538 734 334.2
inch²	3.533577744 × 10+12
kilometer²	2 279.7230174
meter²	2 279 723 017.4
mile²	880.2059779
millimeter²	2.279723017 × 10+15

2-2-2. Different types of units of Distance

In Indian mythology Meru is a sacred mountain which is usually identified as the golden mountain, the great central mountain of the world and the naval of the earth. Verse 1.59 of the Suryasiddhānta gives the diameter of the Earth as1600 yojanas

A yojana is a Vedic measure of distance used in ancient India the exact measurement is disputed amongst scholars with distances being given between 6 to15 km (4 and 9 miles). According to the Suryasiddhānta, the diameter of the Earth is 1600 yojanas.

__________________ *Ebenezer Burgess,

Surya-Siddhanta: A Text Book of Hindu Astronomy, Kessinger Publishing Company, 1998.

1. Table:

1.The Arthasastra- One Yojana	4.5 miles
2.Professor Chiders- One Yojana	12 miles
3.Boursther-One Yojana	20.48 kms (12.73 miles)
4.Stein-One Yojana	about 6 miles
5.Vedic Measure-One Yojana	6-15 kms (4-9 miles)
6.A.C. Bhaktivendata Swamy Prabhupada -One Yojana	13-16 kms (8-10 miles)
7.Alexander Cunningham-One Yojana	8 miles
8.Surya-Siddhanta-One Yojana	5 miles
9.Aryabhata-One Yojana	8 miles
10.Bhaghavat Purana-One Yojana	13-16 kms (8-10 miles)
11.Ancient Geography of India-One Yojana	8 miles

2. Table Unit of Distance: Yojana:

Yojana is defined in Chapter 6 of Book 1 of the ancient Vedic text “Vishnu Purana” as follows

10 Param Anus	1 Parasukshma
10 Parasukshmas	1 Trasarenu
10 Trasarenus	1 Mahirajas (particle of dust)
10 Mahirajas	1 Balagra (Hairs point)
10 Balagra	1 Likhsha
10 Likhsha	1 Yuka
10 Yukas	1 Yavodara (heart of barley)
10 Yavodaras	1 Yava (barley brain of middle size)
10 Yava	1 Angula (1.9 cm or approx 3/4 inch)
6 fingers	1 Pada (the breadth of it)
2 Padas	1 Vitasti (span)
2 Vitasti	1 Hasta (cubit)
4 Hastas	a Dhana, a Dandi, or Parisa 9a man's height) or 2 Narikas=6 feet
2000 Dhanus	1 Gavyuti (distance to which a Coe’s call or lowing lancehead) =12000 feet
4 Gavyutis	1 Yojana=9.09 miles

3. Table:

1.Yojana	One Yojana
2.NityaYojanaVishalah	One million Yojanas (8 million miles)
3.NavaYojanaSahasra	72,000 miles in length
4.Yojana	Yojana (8 miles each)
5.AyutaYojanaUtsedhah	Ten thousand Yojanas high
6.AyutaYojanaVistaraunnathah	Which measure ten thousand Yojanas sigh and wide
7.SahasraYojanaUnnathah	One thousand Yojana high
8.SataYojana	One hundred Yojana
9.EkadassaSataYojanaUttunga	1,100 Yojanas high
10.AstadasaYojanasSahasram	18,000 Yojanas
11.Yojana	Yojana
12.Yojana	8 miles
13.SatTrimsatLaksaYojanaAyatah	3,600,000 Yojanas
14.NavakotiYojanas	At distance of 1600,000 miles
15.DviLaksaYojanaAntaraGatah	Situated at a distance of 1,600,000 miles
16.YojanaLaksaYojanaAntare	At distance of 1.100.000 Yojanas
17.TrayodasaLaksaYojanaAntaratah	Another 1,300,000 Yojanas
18.Yojana	A measurement equal to 8 miles
19.Yojana	A distance of 8 miles
20.SataYojana	One hundred Yojanas
21.YojanaAyutaAntarepa	With an interval of ten thousand Yojanas (8,000 miles)
22.YojanaAyutaAyutam	A distance of 8,000 miles

23.Yojana	8 miles' unit of measurement
24.AyutaYojanaParimamadala	Having a circumference of eight thousand miles
25.YojanaSata	Eight hundred miles
26.Yojana	A measurement of eight miles
27.LaksaYojana	One hundred thousand Yojanas (eight hundred thousand miles)
28.Yojanasatam	Hundreds of miles
29.YojanaAyama	Occupying eight miles of land
30.Yojana	Yojanas (one Yojana measures about 8 miles
31.Yojana	Length of eight miles
32.Yojana	Eight miles
33.SaharaYojana	Thousands of miles
34.KarilaYojana	Harnessed
35.ParaYojana	Gola
36.Yojana	A distance of eight miles
37.PancasatKotiYojana	Four Billion miles

4. Table:

One Angula	¾th of present-day inch
4 Angulas	One Dhanush (Bow grip) 3 Inch's
8 Angulas	One Dhanurmusti (first with thump raised) 6 inch's
12 Angulas	One Vistasta (span distance of stretched our Pala between the tips of person's thumb and litter finger) 9 inch's
4 Vistasta	One Aratni/one Hasta (cubit) 10 inch's
4 Arathis	One Danda/ Dhanus (bow) 6 feet's
10 Dandas	One Rajju (60 feet's)
2 Rajjus	One Paridesha (120feet's)
2000 Dhanus	One Krosa/ Goruta (4000 yards or 2/¼ miles, nearly 3.66 kms)
4 Krosas	One Yojana (9 miles nearly 15 kms so Yojana could be the highest unit of distance or length used in ancient days.

5. Table:

8 Paramanus	One Renu
8 Renus	One Kesham
8 Keshas	One Yuka
8 Yukas	One Thila
8 Thilas	One Yava
8 Yavas	One Manangula
12 Manangulas	One Muru
4000 Murus	One Krosa (small)
8000 Murus	One Krosa (big)

2 Small Krosas	One Aamada (small) 2/22/24 miles
2 Aamadas	One Yojana (small) 4/5/6 miles
2 big Krosas	One big Aamada (4/22/24 miles
2 big Aamadas	One big Yojana (9/5/6 miles

6. Sulva Siddhanta Table:

8 Paramanus	One Trasarenu
8 Trasarenus	One Renu
8 Renus	One Balagha
8 Balaghas	One Likhya
8 Likhyas	One Yuka
8 Yukas	One Yava
8 Yavas	One Angula
24 Angulas	One Hasta
8 Hasta	One Danda
2000 Dandas	One Krosha
8 Kroshas	One Yojana
One Danada	One meter=one Anguala-1. o416 circumference of heart

7. Measurement of distance: Kauntily Table:

8 Atoms	One Paricle
8 Particles	One Liksha
8 Likshas	One Yuka
8 Yukas	One Angula (¾ of inches)
4 Angulas	One Dhanur Graham
8 Angulas	One Dhanur Mushti
12 Angulas	One Vitasti or Chhaya or Paurusha
14 Angulas	One Sama, Sala, Pardrya, Pada
2 Viststis	One Arthi or Praja or Patyabasta
2 Vistastis+1 Dhanurmusti	One Kishku or Kamas
42 Angulas	One Kishku
54 Angulas	One Hasta
84 Angulas	One Vyam
4 Arathis	One Dhanda
108 Angulas	One Pavrusha
6 Kanas or 192 Angulas	One Danda
10 Dandas	One Rajju
2 Rajjus	One Paridesa
3 Rajjus	One Nivartana
3 Rajjus+2 Dandas	One Bahu

100 Bahus	One Krosa
4 Krosas	One Yojana

8. Lengths - Imperial and Traditional Table:

Digit	28th part of a cubit. Width of a finger. Approx.
To half-inch	To steal (slang). Rhyming slang for "pinch.
Inch:	10 lines. 1000 thou. or mils. Width of man's thumb, length of 3 barley corns (Anglo-Saxon).
Palm:	3 inches. Width of man's palm.
Hand:	4 inches. Width of man's hand; used for height of horse at its withers (shoulders). Formerly, approx. 5 inches.
Shaftment:	6 inches. 6½ inches until 12th Century.
Span:	9 inches. Width of man's spread fingers.
Natural foot:	9.8 inches (approx.). Anglo-Saxon.
Roman foot (pes):	11.6 inches (approx.). Roman. 12 Roman uncials.
Foot:	12 inches. Length of (large) man's foot.
Cubit:	2 spans, 28 digits. Elbow to middle finger tip. Approx. 18 inches.
Military pace:	30 inches. Single step.
Megalithic yard:	2.72 feet. Proposed by some archaeologists.
Yard:	3 feet. Length of man's pace. Man's reach from nose to fingertip.
Ell:	3 feet 9 inches. Measurement of cloth. Double forearm.
Roman pace (passes):	3 feet. Length of man's pace. Man's reach from nose to fingertip.
Ell:	5 Roman feet (pedes). 58 inches (approx.). Double step.
Roman pace (passes):	
Geometric pace:	5 feet. 60 inches. Modern version of Roman pace.
Reed:	9½ feet (approx.). 6 Hebrew cubits, possibly a measurement tool rather than a unit.
Rod, pole, or perch:	5½ yards. Anglo-Saxon. Approx. 20 "natural" feet.
Acre (width):	22 yards. 4 rods. Width of a strip in the strip field farming system. See also Acre (area), 22 by 220 yards, now simply 4840 square yards.
Chain (Gunter's or Surveyor's):	22 yards. 100 links. Length of cricket pitch. Each tenth link is a brass tag.
Chain (Ram den's or Engineer's):	100 feet. 100 links. Less common.
Bolt:	40 yards. 32 ells. Measurement of cloth.
Roman stadia:	125 passes. Approx. 608 modern feet. Similar to cable and furlong.
Furlong:	220 yards. 40 rods. 10 chains. Length of an Ox plough furrow; length of a medieval strip field.

Roman mile (mile):	5000 Roman feet. 1000 Roman passes. 8 Roman stadia. Approx. 4860 modern feet.
English & USA mile:	80 feet. 1760 yards. 8 furlongs. 80 chains. Changed from 5000 feet during the reign of Queen Elizabeth I.
Scottish mile:	5952 feet. 1984 yards. Old measure.
Irish mile:	6720 feet. 2240 yards. Old measure. Beware when told that an Irish distance is "a mile and a bit." The bit may be longer than the mile!
Country mile:	vague, long distance — often much longer than a measured mile.
Roman league legal Gallic, also leuca Gallic, (the league of Gaul.):	7500 Roman feet. 1½ Roman mile. 12 Roman stadia. Approx. 7290 modern feet.
League (Devonshire Doomsday Book):	1½ miles. As used in the Devonshire Doomsday Book.
League:	3 miles (usually). Many different definitions; often approx. the distance a person or horse can walk in one hour.
Swedish mile:	10 kilometres. Old measure.

9. Table:

10 Millimetres	One centimetre
10 Centimetres	One decimetre
10 Decimetres	One meter or 1000 millimetres or 100 centimetres
10 Meters	One Decametre
10 Decametres	One Hectometre
10 Hectometres	One Kilometre or 1000 meters or 1,00,00,00 millimetres or 10,00,00centimetres.

10. Table:

144 square inches' (in^2)	One square foot (ft^2)
9 square feet's	One square yard (yd^2) 1296 sq. inches
272¼ square yard's	One square rod ($sqrd^2$)
160 square rods	One acre (43560 sq. feet's)
640 Acre's	One square mile (mi^2)
One-mile square	One section of land
6-mile square	One town ship (36 sections, 365 sq. miles)

11. Table:

100 square millimetres (mm^2)	One square centimetre (cm^2)
100 Square centimetres (cm^2)	One square decimetre (dm^2)
100 Square decimetres (dm^2)	One square meter (m^2)
100 Square meters (m^2)	One square decametre ($decm^2$) one area

100 Square meters (m^2)	One square hectometre (hm^2) one hectare
100 Square hectometres	One square kilometre (km^2)

12. Metric-System prefixes order of Magnitude Table:

Long Scale	Small Scale	Prefix	Symbol	Decimal	Power of Ten	Order of magnitude
Quadrillionth	Septillionth	yacto	y	0	10^-24	
Trilliardth	Sextillionth	zepto	z	0	10^-21	
Trillionth	Quintillionth	atto	a	0	10^-18	
Billiardth	Quadrillionth	femto	f	0	10^-15	
Billionth	Trillionth	pico	p	0	10^-12	
Milliardtg	Billionth	nano	n	0	10^-9	
Millionth	Millionth	micro	μ	0	10^-6	-
Thousandth	Thousandth	milli	m	0	10^-3	-3
Hundredth	Hundredth	centi	c	0	10^-2	-2
Tenth	Tenth	deci	d	0	10^-1	-1
One	One			0	0	0
Ten	Ten	Deca	da	10	10^1	1
Hundred	Hundred	Hecto	H	100	10^2	2
Thousand	Thousand	Kilo	K	1	10^3	3
Million	Million	Megha	M	1	10^6	6
Milliard	Billion	Giga	G	1	10^9	9
Billion	Trillion	Teta	T	1	10^12	12
Billiard	Quadrillion	peta	P	1,000,000,000,000,000	10^15	15
Trillion	Quintillion	exa	E	1	10^18	18
Trilliard	Sextillion	zetta	Z	1	10^21	21
Quadrillion	Septillion	yotta	Y	1	10^24	24

13. Table:

12 inches	One Foot
3 feet’s	One Yard
5½ yard’s	One Rod
40 Rod’s	One Furlong
8 Furlong’s	One mile (1,760 yards or 5,280 feet’s)
1852 meters	6076.11549 feet’s=one international mile

14. Units of Length-International Measure Table:

Units	**Inch's**	**Feet's**	**Yards**	**Miles**	**Centimetres**	**Meters**
One inch	1	0.0833333	0.02777778	1.57838E-05	254	0.0254
One foot	12	1	0.3333333	0.000189394	30.48	0.3048
One yard	36	3	1	0.000568182	91.44	0.9144
One mile	63360	52800	1760	1	160934.4	1609.344
One centimetre	0.3937008	0.0328084	0.01093613	6.21371E-06	1	0.01
One meter	3937008	3.28084	1.09613	0.000621371	100	1

15. Units of Length-Survey Measure Table:

Units	Link	Feet	Roads	Chain	Miles	Meters
One link	1	0.66	0.04	0.01	0.000125	0.2011684
One feet	1.515152	1	o.06060606	0.01515152	0.000189394	0.3048006
One rod	25	16.5	1	0.25	0.003125	5.62921
One chain	100	66	4	1	0.0125	20.11684
One mile	8000	5260	320	80	1	1609347
One meter	4.97096	3.280833	0.1988384	0.0497096	0.00062137	1

16. The distance between worlds from the point of the equator"

(These are worlds, but are not planets, asteroids, where the positions of the gods are as follows)

1.Surya world	1 Million Brahmanda Yojana (The 30 miles 533 yard1foot)
2.Chandra world	2 Million Brahmanda Yojanas
3.Mars, the world	3 Million Brahmanda Yojanas
4.Mercury before the world	5 Million Brahmanda Yojanas
5.Jupiter world	7 Million Brahmanda Yojanas.
6.Venus is the world	9 Million Brahmanda Yojanas.
7.Saturn is the world	11 Million Brahmanda Yojanas.
8.Rasyadi god's world	12 Million Brahmanda Yojanas.
9.Stellar Olympus, the world	13 Million Brahmanda Yojanas.
10.Seven sage's world	14 Million Brahmanda Yojanas.
11.Druva- world	15 Million Brahmanda Yojanas

Land between the centre point and the	
1.Heaven	13millions Brahmanda Yojanas
2.Druva- world (polar)	15millions Brahmanda Yojanas.
3.Maharlokamu	One crore 15 lakh Brahmanda Yojanas.
4.Janalokamu	3 crores 15 lakhs Brahmanda Yojanas
5.Tapoloka	7crore 15 lakh Brahmanda Yojanas
6.Satya-Loka	15 crores 15 lakhs. Brahmanda Yojanas
7.Frescoes backed up (gorgeous ring wall)	24crores and 50lakh. Brahmanda Yojanas million.
8.Backed out of the atolls	25 crores and 50 lakhs Brahmanda Yojanas million.

17.Native land of the great oceans: Table:

1.Jambu- Dweepa (Indian Black berry tree)	1 million Brahmanda Yojanas
2.Lavana- Samudra (Salt Ocean)	1 million Brahmanda Yojanas
3.Plaksha- Dweepa (Ficus religiosa (Peepal tree)	2 million Brahmanda Yojanas
4.Ikshurasa- Samudra (Sugar cane Juice Ocean))	2 million Brahmanda Yojanas
5.Shalmai-Dweepa (Bombax tree)	4 million Brahmanda Yojanas
6.Sura- Samudra (Wine Ocean)	4 million Brahmanda Yojanas
7.Kusha-Dweepa (Grass)	8 million Brahmanda Yojanas
8.Ghrita-Samudra (Ghee Ocean)	8 million Brahmanda Yojanas
9.Kraunca-Dweepa (Mountain)	16 million Brahmanda Yojanas
10.Dadhi-Samudra (Curd Ocean)	16 million Brahmanda Yojanas
11.Shaka-Dweepa (Pine tree)	32 million Brahmanda Yojanas
12.Dugdha-Samudra (Milk Ocean)	32 million Brahmanda Yojanas
13.Pushkara-Dweepa (Maple tree)	64 million Brahmanda Yojanas
14.Swadujala-Samudra (Sweet water)	64 million Brahmanda Yojanas
15.Chaalchala Mountain	128 million Brahmanda Yojanas
16.Chakravaala Mountain	256 million Brahmanda Yojanas
17.Tamo land	1250 million Brahmanda Yojanas

Lokaaloka mountains beyond the sun's rays do not enter the area in between Andabhitti and Lokaaloka mountains Therefore darkness will be always present.
Andabhitti-be with a one crore yojanas thickness.

3.Methodology

Importantly, this research methodology was based on the Ramayana exposition and the distance of Yojana (The Vedic Distance Measurements) based on Surya Siddhant, Aryabhata Theory, Astrology, The Great Pyramid and the Earth Measurement.

Based on these are systematically written according to the research methodology.
In the Ramayana the lengths of Sethu, Lanka and Ayodhya cities are referred to as the Yojana standard.

These are described in the Sethu and Determination of the Island of Sri Lanka in *Brahmanda Srushti Vijnanam* written by *Sri Kota Ventachalam*, which is based on the idea of how easy it is to change the miles and kilometers of this distance standard.

Similarly, as described in the Ramayana, the grate bridge is 100 Yojanas long, 10 Yojanas wide, the City of Lanka length is 100 Yojanas, the width is 30 Yojanas, and the City of Ayodhya is 12 Yojanas long and 3 Yojanas wide.

Based on the Brahmanda Srushti Vijnanam, the Yojana Distance Standard is described in The Great Pyramid and The Bible. One Yojana = 7. 95775388 kilometers or 4.94471902 miles.

And according to Surya Siddhant, Aryabhata theory, the definitive standard for the Yojana distance standard is based on the fact that today's distant standards of the cities of Sethu, City of Lanka and Ayodhya are known.

The following standards are known when the yoga distance standards described above are incorporated into the distance standards of today.
One Yojana = 7. 95775388 kilometers or 4.94471902 miles.
The length of The Great Bridge (Sethu) by these standards = 795. 775388 km, width = 79. 5775388 km.
City of Lanka Length = 795. 775388 km, Width = 238.7326164 km,
Similarly, City of Ayodhya Length = 95.49304656 km, Width = 23.87326164 km.

Based on the above methods, a specific distance standard is specified. Based on these, The Great Bridge, City of Lanka as well as the City of Ayodhya.
According to Yojana, the distance between Kanyakumari to the southern equator, and Kanyakumari is the midpoint of the *Badamukha* Mountain (South Pole).
For today's distance standards, the difference between these standards is negligible.

According to the above methods, the Ramayana and today's sciences have an inherent connection.
The Ramayana, the most important of the texts of India, is a mimicry of other sciences.

4. Result

The oldest Sanskrit astronomical texts to survive were written around 600 A.D. One of the most notable of these texts is the Surya Siddhānta survives in a much-revised version. In 1858 Ebenezer Burgess published an annotated English translation of this text, available now as Surya-Siddhantha, a text-book of Hindu astronomy.
Surya (Sanskrit) the Sun, its regent or informing divinity; in the Vedas, Surya is the Sun-God. Surya presiding over the space of the solar system.
The Mount Meru may actually refer to the "centre of the world". In Indian mythology Meru is a sacred mountain which is usually identified as the golden mountain, the great central mountain of the world and the naval of the earth.

Verse 1.59 of the Surya Siddhānta gives the diameter of the Earth as 1600 yojanas. A yojanais a Vedic measure of distance used in ancient India. The exact measurement is disputed amongst scholars with distances being given between 6 to15 km (4 and 9 miles). According to the Surya Siddhānta, the diameter of the Earthis1600 yojanas.

Verse 1.59 of the Surya Siddhānta gives the diameter of the Earth as1600 yojanas. Geometry of the Great Pyramid.

Height of the Great Pyramid =147.6505019m
Circumference of the Circle A=147.6505019m²
d = 46.99865415m
Area of the Circle A= 1734.843719 m² = Area of the Square BC=41.65145518m
Width of the Pyramid's King Chamber = 206.0658189 inches = 10 Royal cubits =5.2340718 m
C=41.65145518m
41.65145518:5.2340718 =7.957753881
Verse 1.59 of the Surya Siddhānta gives the diameter of the Earthas1600 yojanas:
1600 · 7.957753881 = 12,732.40621 =in kilometres
It's the average diameter of the Earth.
12,732.40621 · 3.14159 = 40,000=in kilometres it's the average circumference of the Earth
40,000: 7.957753881 = 5026.543997 yojanas.
Conclusion: yojana=7.957753881km =4.944719017miles
1 yojana= 7.957753881 (km) =C Area of the Square B =63.32584683=Area of the Circle Ad =8.979367488Circumference of the Circle A = 28.20949111
28.20949111 · 3.14159= 88.62265518 = C
Geometry's source of the yojana
C = 88.62265518.

Area of the Square B =7853.975011(km²) =2500Pi = Area of the Circle Ad=100
Circumference of the Square A=314.159=100Pi

In Indian mythology Meru is a sacred mountain which is usually identified as the Golden Mountain, the great central mountain of the world and the naval of the Earth.

It has been proved: As per Pythagorean Theorem to find out Lanka and Sri Lanka distance.

Pythagorean theorem: In any right triangle, the area of the square whose side is the hypotenuse is equal to sum of the areas of the squares whose sides are the two legs. The theorem can be written as an equation relating the lengths of side a, b, and c, often called the Pythagorean equation. “c” represents the length of the hypotenuse, and “a" and "b" represent the lengths of the other two sides as pointed out in the introduction, if "c" denotes the length of the hypotenuse and "a" and "b denote the lengths of the other two sides, Pythagoras' theorem can be expressed as the Pythagorean equation.

if the length pf both "a" and "b" are known, then "c' can be calculated as follow.
If the length of hypotenuse c and one leg (a or b) are known, then the length of the other leg can be calculated with the following equations:

As pointed out in the introduction, if c denotes the length of the hypotenuse and a and b denote the lengths of the other two sides, the Pythagorean theorem can be expressed as the Pythagorean equation:

$$a^2 + b^2 = c^2.$$

If the length of both a and b are known, then c can be calculated as

$$c = \sqrt{a^2 + b^2}.$$

If the length of the hypotenuse c and of one side (a or b) are known, then the length of the other side can be calculated as

$$a = \sqrt{c^2 - b^2}$$

or

$$b = \sqrt{c^2 - a^2}.$$

1st Proofing:
AB=a=494.4719017: Nagercoil (Kanyakumari) to Lanka
BC=b=261.97608: Nagercoil (Kanyakumari) to Matara
AC=c=Lanka to Matara (Sri Lanka)? Asper Pythagorean theorem to find out AC distance.
a= Nagercoil (Kanyakumari) to Lanka: 494.4719017 miles
b= Nagercoil (Kanyakumari) to Matara: 261.97608 miles
c= Lanka to Matara (Sri Lanka): 559.58371 miles p=perimeter of Right Triangle
=a+ b+ c=1316.03169 miles
s=semi perimeter of Right Triangle=(a+b+c)/2=658.01585 miles k=Area of Right Triangle=(ab)/2=64769.90524 miles’ ha=Altitude a of Right triangle=b=261.97608 miles hb= Altitude a of Right triangle=a=494.4719 miles hc= Altitude a of Right triangle=(ab) /c=231.49318 miles.

Latitude and Longitude distance measurements.

	Kanyakumari	Colombo
Latitude:	77° 32′ 27.6″ E	79° 50′ 34″ E
Longitude:	8° 4′ 40.8″ N	6° 56′ 4″ N

Miles: 141.12146836103418
Kilometers: 227.11298837802022
Middle point : N 78 0 6.34, E 7 4 55.66

GPS Latitude and Longitude Distance Calculator
Colombo: Longitude A 6.93194
Latitude A 79.84778

Kanyakumari: Longitude B 8.2378
Latitude B 77.3324
From GPS Coordinates
Longitude A 6.559163999999996
Latitude A 79.508668
TO GPS Coordinates
Longitude B 8.14268
Latitude B 77.19944
Results

Distance	280967.15394936444	Meters
Distance	921808.2773595032	Feet
Distance	280.96715394936444	Kilometers
Distance	174.58456044951657	Statute Miles
Distance	151.70677283002786	Nautical Miles
Bearing	186.50472572297747	Degrees
Bearing	3.2551215343949185	Radians

As per Pythagorean Theorem:
Kanyakumari to Colombo (Sri Lanka) in between distana:151.706772 miles
Kanyakumari to Lanka (not Sri Lanka) in between distance:494.4719017 miles
Lanka to Sri Lanka in between distance?
$a^2+b^2=c^2$
a= Kanyakumari to Colombo (Sri Lanka) in between distana:151.706772 miles
b^2= Kanyakumari to Lanka (not Sri Lanka) in between distance:494.4719017 miles
$c^2=151.706772^2+494.4719017^2$.

Lanka to Sri Lanka distance=c=516.562677707 miles.
∴516.562677707-423.4190017=93.143676007 miles' difference
Colombo to Dondra Head +103.2 miles
∴ 103.2-93.143676006=10.056323994 miles' difference
Note: According to the details described above, Sri Lanka (Simhala) and the city of Lanka in the areas of difference between the shall appear. Planning of Ramayana, laid the standard for today's science to go beyond the standardized distance.
According to the latitude and longitude measurements of distance, Pythagorean theorem and Srimadramayana according to the distance of the Valmiki written in the standard planning kilometer equal to the present day and are miles.

As per Ramayana which measurements to equal of modern science.
As per Surya Siddhanta ruler's one yojana to converted in to Miles.
1. Mahindra mountains (India) and Southern Ocean melted place (Kanyakumari) to Lankanagara (upper side of equator) Northern side Suveladri Mountains in between distance: 495.50 miles.

2. Lankanagara to Pushpitaka mountain in between distance:650 miles
3. Pushpitaka mountain to Suryagiri in between distance:677.50 miles
4. Surayagiri to Vaidhyuta giri in between distance:600 miles
5. Vaidhyuta giri to Kunjara mountains in between distance :400 miles
6. Kunjara mountain to Vrushabha mountain in between distance:1400 miles
7. Vrushabha mountains to Chandanavana (Sandal forest) in between distance :1200 miles
8. Chandanavana to Badamukha mountains (south pole) in between distance :1328 miles.

$\therefore$ Kanyakumari to Badamukha mountains (south pole) in between: 6,750 mails
494.50+650+677.50+600+400+1400+1200+1328:6750 miles

As per modern science to measurement from Kanyakumari to South equator and South pole
Kanyakumari to South equator in between distance :561.098 miles
Kanyakumari to South Pole in between distance:6776.0529 miles.
The difference Ramayana measurements and Modern Science measurement:
6776.0529-6750:26.0529 miles.

5.Conclusion

It is small difference from Indian Mythology and Modern Science +26.0529 miles.
As describe in Ramayana, places and distance comply with modern Science.
1.Srimadramayana 5th chapter and 5th to 25th stanza in Balakhanda.

"*Aamataa dashachadvecha yojanaani mahapurii*
Srimati triNi vistirNaa suvibhaktamahapadaa"

length of 12 yojanas and width was 3 yojanas area covered the Ayodhya city
2.Srimadramayana 3rd chapter 23th stanza 3rd line in Uttarakhanda

"Trimshadhyojana vistirNaa shatayojana maayata"

100 yojanas length and 30 yojanas with area covered the city of Lanka.In the Valmiki Ramayana Epic, Hanuman crossed the ocean from Vindya mountains. He crushed the Mahendragiri mountain into the water when he was on the mountain. And he crossed the 100 yojana sea.

As per Valmiki Ramayana:

"'A number of days and nights passed, filled as we were with grief, having got lost our way intensely in a mountain-range called Vindhya. We were determined to forsake our lives because of despair in our non-fulfillment of work, in our overstepping of time-limit given by Sugreeva and in fear of the King Sugreeva."

"Hearing those delightful words of Sampati, we with our Chief Angada started soon from there. The monkeys were very much delighted and satisfied. They were making up their energy to see you, rose up from Vindhya mountain and reached the northern shore of the ocean. All the monkeys with their Chief Angada, in their anxiety to see you, reached the ocean. They were frightened after seeing the ocean there and they were again worried."

"Thereafter, seeing the ocean, I removed the serious fears of the army of monkeys who were worrying and crossed hundred Yojanas across the sea. Entering even Lanka, filled with demons in the night, I saw Ravana and you too who were immersed in grief. O the faultless princess! I told you all this as actually occurred. I am the messenger of Rama. Talk to me."

From the above all the monkeys were in Vindhya mountain searching Sita.

Now the task was to cross the ocean and Angadha asked each one to proclaim his prowess in jumping over the ocean which was 100 yojanas long. One said he can do 10, another said 20 and another 30 and thus each one added the number of yojanas they could cross and Angadha said that he could cross 100 yojanas but doubted whether he could come back the same distance. Jambavan said that he could cross 90 yojanas only due to his age but the sea was 100 yojanas long.

To another account, Ram Sethu is not 1.75 million years old or 3500 years old but is nearly 18,149,118 years old.

The Ramayana happened during 24th Treta Yuga. So, One Chaturyuga=Satyuga 1,728,000 years+ Tretayuga 1,296,000 years+ Dwapar Yuga 864,000 years+ Kali Yuga 432000 years.
=4320000 years. 4320000X4=17,280,000 years + 864000 years of Dwapara Yuga + 3,102isthe beginning of Kaliyuga years+2016 AD=18,149,118 years.

The distance between Mahendragiri and Lanka was about 100 yojanas during Ramayana.
1 yojana=7.957753881km =4.944719017 miles. As per Surya Siddhanta theory to profit.
Therefore 100 yojana=100×7.957753881 =795.7753881 Kms or 100×4.944719017 =494.4719017 miles.

Danushkodi is about 18 miles (29 km) West of Talaimannar in Sri Lanka.
3×7.957753881=23.873261643 or 3×4.944719017=14.834157051miles
Between
Madapam Railway station to Pamban=8.9 kms
Pamban to Rameshwaram= 12.6 kms
Rameshwaram to Dhanushkodi = 18 Km 659 Mtrs
Danushkodi to Talaimannar= 27 km 959.76 Mtrs
Total distance from Madapam to Talaimannar=68.118 kms.

Shall build a bridge from Rameshwaram from the Madapam and from Dhanuskodi shall build a bridge to Talaimannar. That is to build two bridges to Talaimannar from Madapam. But Rama was only a single bridge construction.
Madapam, Pamban, Rameshwaram, and Danushkodi these areas any kind of Mountain specially Mahendra hills. In this area, all the Eastern plains.
Now this distance has been reduced considerably and only 5 yojanas or 60 Kms. is the distance left.
As per the details available from the reference it is 3 yojanas only from Rameshwaram to Sri Lanka sea route.

Another version:
As mentioned in Valmiki Ramayana, the evidences for its location in Rameshwaram-Dhanushkodi are provided:

atra purvam mahadevah prasaam asoorot prabhu.

While returning to Ayodhya, together with Sita Devi, after killing Ravana, there are episodes related from Pushpaka Vimaana. Sri Rama notes, pointing to the starting point of Setu (Dhanushkodi), that Sri Mahadeva granted Anugraha to Sri Rama at this place.

Rama Sethu is 100 yojanas long, 10 yojanas wide, according to Valmiki Ramayana. This ratio of 10:1 is evidenced by the dimensions of Rama Sethu evidence at it is floating from south to south-east. The Sethu floating period 90 percent of Sethu was sink in ocean and remain part of 10 percent of Sethu can be seen every one in between Danushkodi to Talaimannar. These actual dimensions of Rama Sethu can be seen by everyone.

Kanyakumari to South equator and South pole distance.
Yojana distance measurements and Modern Miles or kilometer distance measurements are equal.
Distance measurements (Very important calculation)
As per google search datandtime.info distance measurements are given below:
Delhi, India to South pole in between distance
1.Delhi, India to Kanyakumari distance:2288.95 kilometers---1422.29 miles
2.Delhi, India to south equator distance:3190 kilometers---1982 miles
3.Delhi, India to South pole distance:13208 kilometers---8207 miles
4.Kanyakumari to Equator distance:3190-2288.95=901.05 kms
:1982-1422.29=559.71 miles
5.Kanyakumari to south pole distance:9436 kilometers---5863.3 miles
6.Sri Lanka (Colombo) to equator distance:772 kilometers---479 miles
7.Sri Lanka (Colombo) to South pole distance:10790 kilometers---6705 miles
Kanyakumari to Lanka distance:
795.7753881 kilometers---494.4719017 miles
(Grace of Sri Rama 5th Chapter)
Lanka to Equator distance:901.05-795.7753881=105.2746119 kms
:559.71-494.4719017=65.2380983 miles
Kanyakumari to South pole in between distance
Kanyakumari to City of Lanka (upper side of equator) Northern side Suveladri mountains in between distance= 495.50 miles.
2.Lankanagara to Pushpitaka mountain in between distance=650 miles
3.Pushpitaka mountain to Suryagiri in between distance=677.50 miles
4.Surayagiri to Vaidhyutagiri in between distance =600 miles
5.Vaidhyutagiri to Kunjara mountains in between distance =400 miles
6.Kunjara mountain to Vrushabha mountain in between distance=1400 miles
7.Vrushabha mountains to Chandana vana (Sandal forest) in between distance=1200 miles
8.Chandana Vana (Sandal forest) to Badamukha mountains (South pole) in between distance =1328 miles.

∴ Kanyakumari to Badamukha mountains in between=6,750 miles
494.50+650+677.50+600+400+1400+1200+1328=6750 miles.

As per modern science, measurement from Kanyakumari to South equator and South pole
Kanyakumari to South equator in between distance=561.098 miles
Kanyakumari to South pole in between distance=6776.0529 miles
The difference Ramayana measurements and Modern distance measurement:
6776.0529-6750=26.0529 miles.

Conclusion: It is small difference from Indian Mythology and Modern Science +26.0529 miles;
City of Lanka to South pole distance:6776.0529-494.4719017=6281.5809983
Sri Lanka to South pole, Lanka to South pole and Lanka to Sri Lanka in between distance:
Sri Lanka (Colombo) to South pole distance: 6705 miles

City of Lanka to South pole in between distance: 6281.5809983 miles
City of Lanka to Sri Lanka (Simhala) in between distance: 6705- 6281.5809983=423.4190017 =423.4190017 miles.

6.Appendix A Questionnaire for participants

1.Where does the word Yojana come from?

Ans: Meaning of Yojana: yojana. [Skt.] n. Joining, union, junction. cercadamu, kurpu. A measure of distance equal to four krosas, that is about ten miles, Amada. yojincu yojintsu. v. a. To join, unite. kurcu.

Yojana (nt) (Vedic yojana) 1. The yoke of a carriage J.Vi.38,42 (=Ratha-yuga).2. a measure of length; as much as can be travelled with one yoke (of oxen), a distance of about 7 miles, which is given by Bdhgh as equal to 4 gavutas (DhA.II,13). It occurs in descending scale of yojana-tigavuta-usabha at DhA, I,108, Dh,60: J.V,37(yojana-yojana-vitthata each a mile square).

2. How standard is yojana distance?

Ans: The distance standard is determined by the time of the sun's ray on the earth and the speed of the rays. With this distance standard, the Yoga is a standard for measuring the distance of planets, planets, worlds above and below.

3.What relationship does Yojana have to Ramayana?

Ans: The Ramayana is described in three main ways.
Sri Rama is described in terms of the distance of the settlements, the dimensions of the Ayodhya Nagar, the Sethu structure, as well as the dimensions of the city, which are referred to as the Yojana standard.

4. In what year is the distance measured in kilometers?

Ans: The kilometer (SI symbol: km; /ˈkɪləmiːtər/ or /kɪˈlɒmɪtər/), spelt kilometer in American English, is a unit of length in the metric system, equal to one thousand meters (kilo- being the SI prefix for 1000). It is now the measurement unit used for expressing distances between geographical places on land in most of the world; notable exceptions are the United States and the United Kingdom where the statute mile is the unit used.

By a decree of 8 May 1790, the Constituent assembly ordered the French Academy of Sciences to develop a new measurement system. In August 1793, the French National Convention decreed the metre as the sole length measurement system in the French Republic. The first name of the kilometer was "Millaire". Although the metre was formally defined in 1799, the myriametre (10000 meters) was preferred to the "kilometer" for everyday use. The term "myriamètre" appeared a number of times in the text of Develey's book Physique d'Emile: ou, Principes de la science de la nature,[10] (published in 1802), while the term kilometer only appeared in an appendix. French maps published in 1835 had scales showing myriametric and "lieues de Poste" (Postal leagues of about 4288 meters).

The Dutch, on the other hand, adopted the kilometer in 1817 but gave it the local name of the mijl It was only in 1867 that the term "kilometer" became the only official unit of measure in the Netherlands to represent 1000 meters.
Two German textbooks dated 1842 and 1848 respectively give a snapshot of the use of the kilometer across Europe: the kilometer was in use in the Netherlands and in Italy, and the myriametre was in use in France.

In 1935, the International Committee for Weights and Measures (CIPM) officially abolished the prefix "myria-" and with it the "myriametre", leaving the kilometer as the recognized unit of length for measurements of that magnitude.

5.What is the difference between kilometers and miles per Yojana distance?

Ans: One yojana equal to 7. 95775388 kilometers or 4. 944719017 miles.

6.Is this actress the difference in miles or miles to the Yojana distance standard in the Ramayana?
Ans: Mainly according to the Ramayana
1. The length of Sethu is equal to 100 yojanas 795. 775388 km
2. Distance between Kanyakumari from Delhi = 2288. 95 km
3. Distance between Delhi's south equatorial line = 3190 km
4. Distance from Kanyakumari to Lanka cities = 3190-2288. 95 = 901. 05 km
5. Length of serum = 795. 775388 km
6. Distance between Sethu and Sri Lanka = 901. 05-795. 775388 = 105. 274612 km
7.The city of Lanka is 105. 274612 km above the southern equator.

7.Distance measurements in the Ramayana are the differences in today's distance measurement?

Ans: According to the text of Sri Kota Venkatachalam in the Brahmanda Srushti Vijnanam in Sethu and the Island of Lanka (Island) Chapter and in the Ramayana, the difference between the measurements of the day and the present day is very brief.

Kanyakumari to South pole in between distance
Kanyakumari to City of Lanka (upper side of equator) Northern side Suveladri mountains in between distance= 495.50 miles.
2.Lankanagara to Pushpitaka mountain in between distance=650 miles
3.Pushpitaka mountain to Surya Giri in between distance=677.50 miles
4.Surayagiri to Vaidhyuta Giri in between distance =600 miles
5.Vaidhyutagiri to Kunjara mountains in between distance =400 miles
6.Kunjara mountain to Vrushabha mountain in between distance=1400 miles
7.Vrushabha mountains to Chandana Vana (Sandal forest) in between distance=1200 miles
8.Chandana Vana (Sandal forest) to Badamukha mountains (South pole) in between distance =1328 miles.

∴ Kanyakumari to Badamukha mountains in between=6,750 miles
494.50+650+677.50+600+400+1400+1200+1328=6750 miles.

As per modern science, measurement from Kanyakumari to South equator and South pole
Kanyakumari to South equator in between distance=561.098 miles
Kanyakumari to South pole in between distance=6776.0529 miles
The difference Ramayana measurements and Modern distance measurement:
6776.0529-6750=26.0529 miles.
Distance measurements in the Ramayana are related to today's distance measurements, and according to the above quotations, the difference between the two is quite small.

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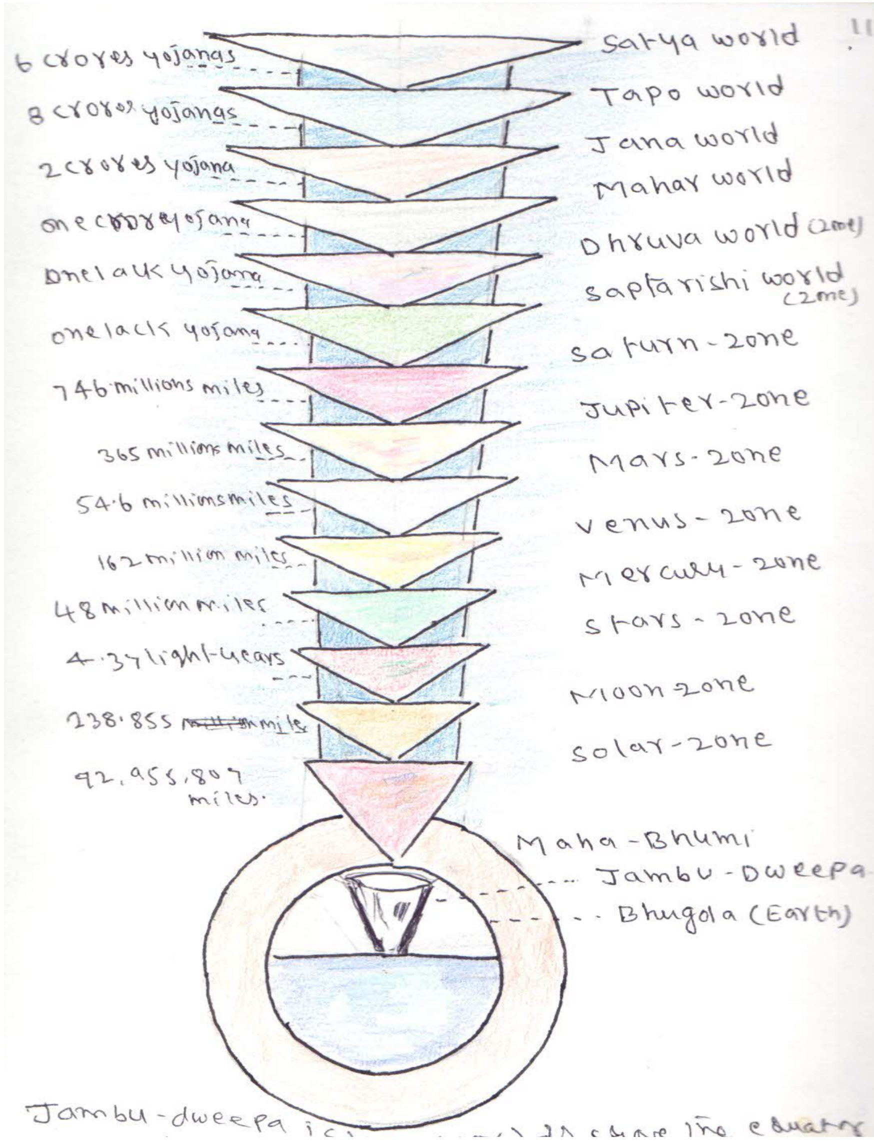
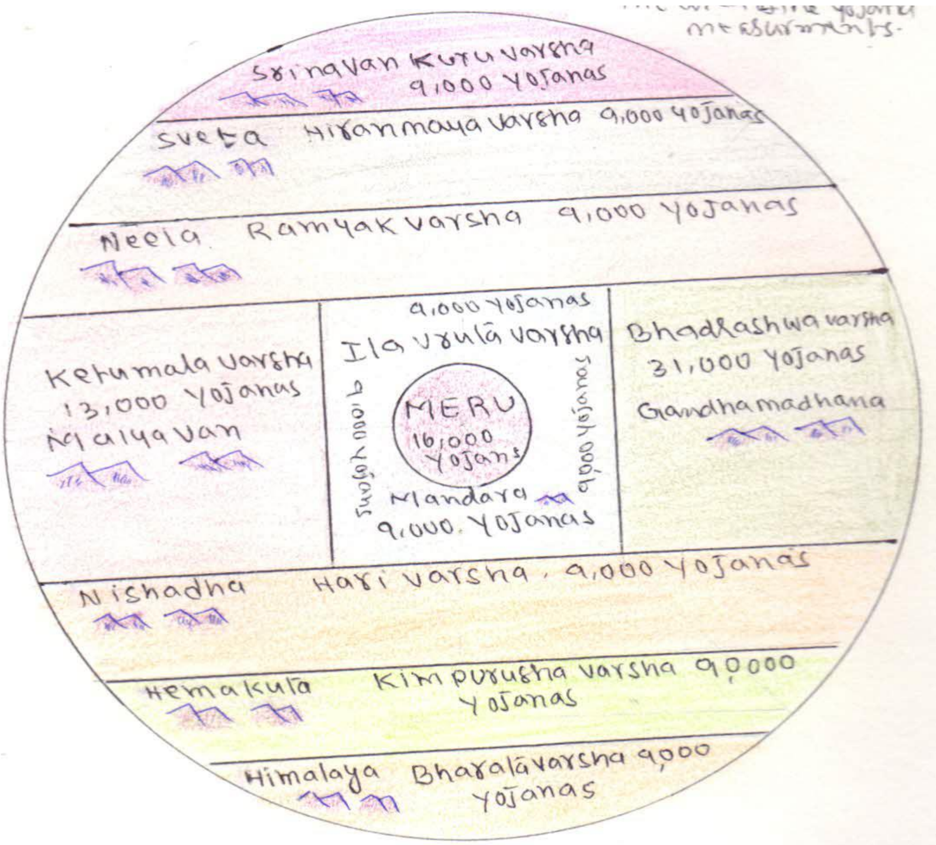
8. Graphical representation

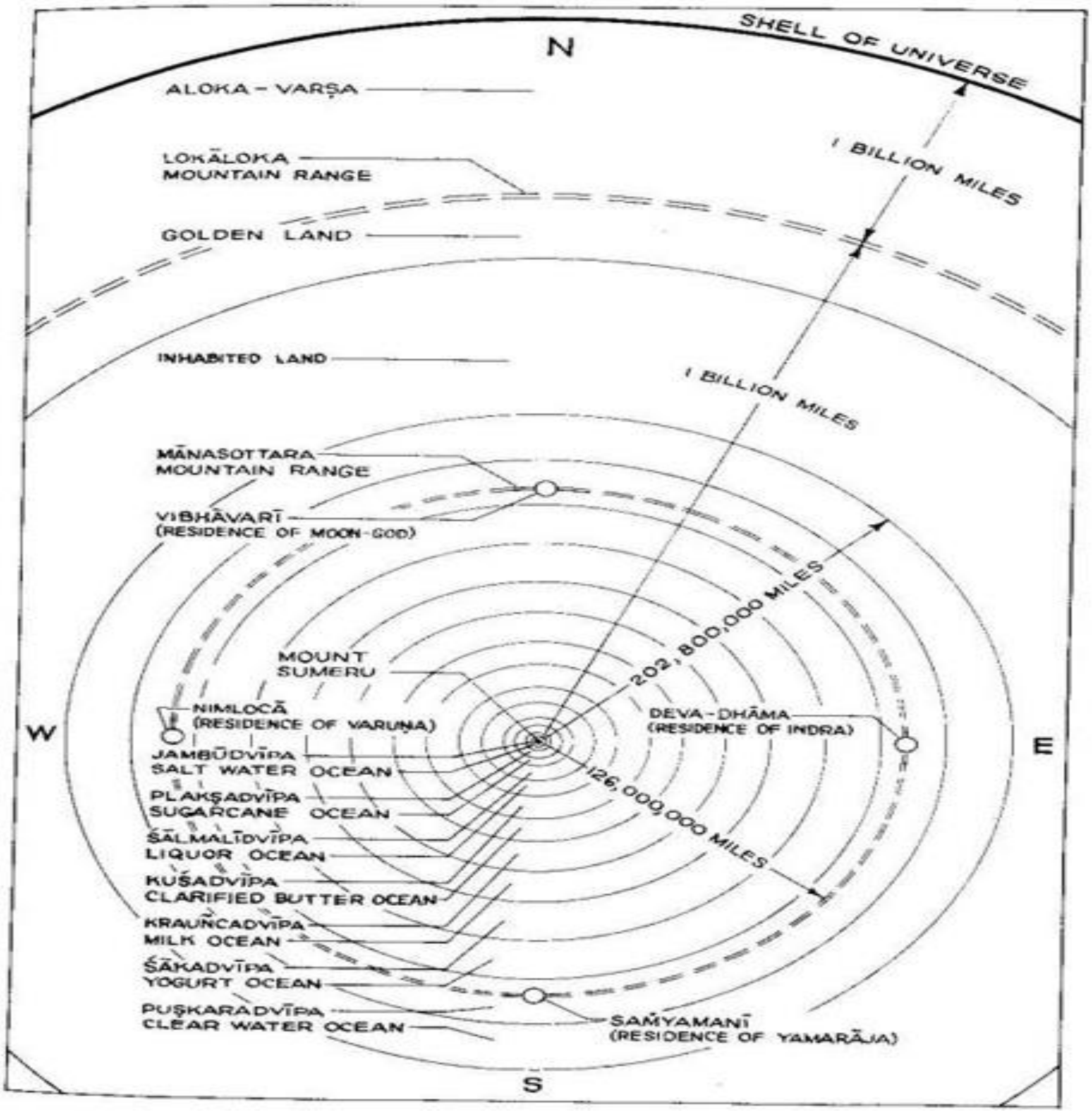


5-1-1-1-2-1. Distance between the worlds above the earth.

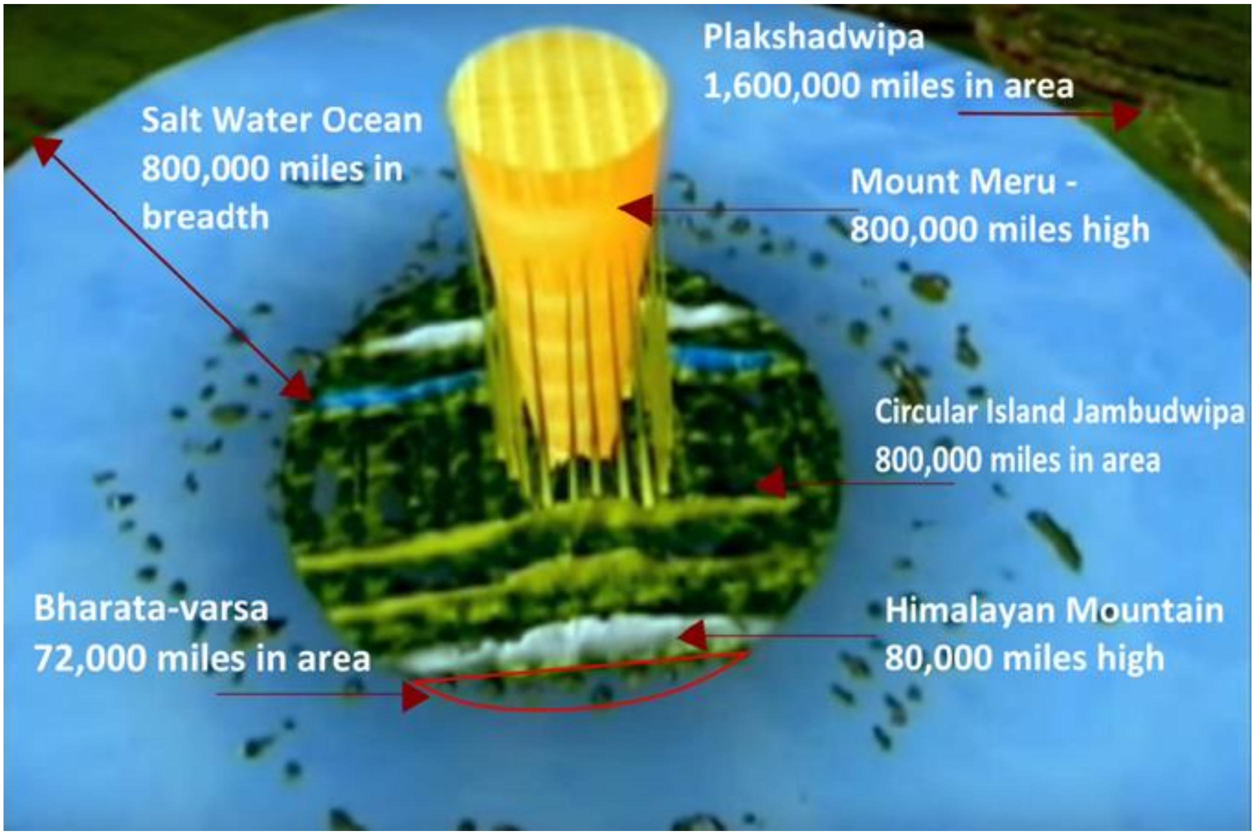


5-1-1-1-2-2. The Provinces of the Jambu-Dweepa are details of the areas in yojana units.
Jambu-Dweepa around 150,000 yojanas units

1.Bharatha-Varsha-9,000 Yojanas
2.Kimpursha-Varsha-9,000 Yojanas
3.Hari-Varsha-9,000 Yojanas
4.Ketumala-Varsha-13,000 Yojanas
5.Ilavryta-Varsha-36.000 Yojanas
6.Meru Mountain-16,000 Yojanas
7.Bhadhrashwa-Varsha-31,000 yojanas
8.Ramanaka-Varsha-9,000 Yojanas
9.Hiranmaya-Varsha-9,000 Yojanas
10.Kuru-Varsha-9,000 Yojanas



5-1-1-1-2-3. Bhu-mandala up to the point of Lokaloka mountain, Sukadeva Goswami summarizes his description in SB 5.20.38. Therein he states that learned scholars who are free from mistakes, illusions, and propensities to cheat, have calculated that the distance from Mount Meru to Lokaloka is 125,000,000 yojanas (1 billion miles), which is a quarter of the overall size of *Bhu-gola*.



5-1-1-1-2-4. Jambudwipa is the first and central island on this Earth plane and is described as being circular like a lotus leaf, and measuring 800,000 miles in area (SB 5.16.5).

9. Introduction of Author

Name: **Muthyala Ramakrishna Rao**

Born: 31 Jul 1956

Birth place: Hyderabad

Parents: Late Saraswathi Bai, Kondal Rao

Wife: Late Sulochana

Offspring: Two sons

1.The eldest son: Muthyala Sri Varun,

Daughter-in-law: Sandhya

Granddaughter: Swara

2.Youngest son: Muthyala Sri Haran

Daughter-in-law: Madhuri

Grandson: Vedant

Education

Name of Institution	Place of Institution	Year	Division
Board of Secondary School Secondary Certificate	Z.P.H.S. Gomaram/Medak district	1973	1st division
Board of Intermediate	Medichal/Rangareddy District	1975	3rd division
Bachelor of Arts (B.A)	Manav Bharati University/Himachal Pradesh	2011-2013	1st division
Master of Arts (M.A) English	Manav Bharati University/Himachal Pradesh	2013-2015	1st division
Master of Arts (M.A) History	Himalayan University/Itanagar.	2015-2017	1st division

Service

Professional Experience	Corporation	year	Particular
Greater Municipal Corporation of Hyderabad	Sanitary Supervisor (Health Section)	1981-2011	Retried in Service

Author

Author	Name of the book	Language	Year
	Sri Rama Ramayana	Telugu	1996-2009
	Geography of Ramayana (Research book)	English	2004-2019

Research

Research	Subject	Language	Year
Author	Geography of Ramayana	English	2004-2019
Research	Ramayana is connectivity Modern Science Sethu (the grate bridge), City of Lanka (not Sri Lanka), Sri Lanka and the bridge, described in the Ramayana, drifting towards the north-east side.	English	

Organization

Trust (nonprofit organization)	Year
Sri Rama Trust	Reg no: 98/BK-4, CS no: 106/ 2014

Membership other Associations

Current Membership	Country
1.Indian Author Association	Haryana/India
2.International Writer Association	USA
3.Asian society Centre India	India
4.The Author of Society	United Kingdom
5.United writer's association	Tamil Nadu, India
6.DK International Research Foundation	Tamil Nadu, India

International Journal Publication

International Journal Publication	Year
1.International Journal of Science &Research	2015
2.International Journal of Scientific and Research Publications	2015
3.1st International young Scientist Congress	2015
4.International Research Journal of Social Science Publication	2015

Contact No:91+9866420245
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Book: Geography of Ramayana
Section: Research aspects
Subject: Geography
Topic: The Yojana Theory (Vedic distance measurements)

10. VITA

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Professor name: Date of Birth:

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University of Leeds LS2 JT, United Kingdom

Doctor of Philosophy, Geography

Special Honors and award: Doctor of Philosophy

Research paper Title: **The Yojana Theory (Vedic distance measurement)**

Major Professor:

Publication: