THE

STORY OF CREATION

AS SEEN

BY THE SEERS
The Story of Creation
As Seen
By The Seers

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To
The Loving Memory
of
MY WIFE
Pandita Satyavati Shastri
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## CONTENTS

1. **Primordial Forms of Matter**  
   - Veda and *Sāṃkhya*  
   - Different kinds of *Paramāṇus*  
   - Western surmises about motion  
   - Properties of *Bhūta Tanmātrās*  
   - What are heat and light  
   
2. **Properties of Matter**  
   - Two forms: causal and effect: *Prithivī*  
   - Primordial seeds  
   - The Sun:  
   - Real Element: *Āpaḥ*  
   - Expansion of gases  
   - Real Element: *Agniḥ*  
   - A mistake in Physics  
   - Heat effect of *Astras*  
   - Anti-Atomic bomb  
   - How light rays travel  
   - Real Element *Vāyu*  
   - Forms of motion  
   - Real Element *Ākāśa*  
   
3. **Paramāṇus or Anus Unite**  
   - Similarity of Greek and *Bhāratīya* terms  
   - Mutual Entry of *Paramāṇus*  
   - Bomb explosion  
   
4. **Union of Two, Three or Four Anus**  
   - The Atom of modern Physics  
   - Molecule  
   - Causes of the union of molecules in substances  
   
5. **Creation and Dissolution Cycles**  
   - The Gods  
   
6. **The Night and the Great Ocean**  
   - Three States of water  
   - Gas presupposes a Chemical element
7. Garbha=Embryo or Anda=The Egg ... 101
   Prajāpati or Puruṣa ... 107
   Egypt reiterates the same Truth ... 109
   Bible repeats the same ... 110
8. Duration Period of Golden Germ State ... 112
9. Prajāpati: Creation Begins ... 114
   Prajāpati and the Word ... 116
   New Testament ... 116
   Bible proclaims the Truth ... 118
   What is North-East ... 121
10. Prajāpati Procreates: Birth of the Earth ... 124
    Earliest phase of the Earth ... 128
    Earth, a span in size ... 129
    Earth extended ... 130
11. Birth of Antariksha, Middle Region ... 138
    Necessity of the middle region ... 140
12. Birth of the Sun ... 142
13. Birth of the Moon and other Heavenly Bodies ... 145
    Black in the moon ... 147
14. Proximity of Heaven and Earth ... 150
    Naturally the Sun also near the Earth ... 154
15. Only once in a Cycle ... 158
16. The Worlds Began to Recede ... 159
17. The Middle Region Expands ... 162
18. Expansion of Heaven and Earth ... 165
19. The Sun Pushed up ... 168
    Killing of Vṛitra and Sun's place in heaven ... 173
    Once in Regions High, the Sun again came near the Earth ... 174
    Definite speed of Receding ... 177
20. Shaky and Unstable Worlds ... 179
    Bible repeats this Truth ... 180
21. The Worlds Made Firm ... 182
    Further Adjustment for firmness ... 192
    Quarters bestow firmness ... 192
    How Magnetic Fields ... 194
22. The Earth Again ... 196
    First Creation: Foam; Second Creation: clay ... 197
Bhūmi Expands; Small Prithvi
Rays cause Expansion
Third Creation: Shushkāpa
Fourth Creation: Ūsha—Saline Earth
Fifth Creation: sīkā—silica
Sixth Creation: sharkarā—Pebbles
Seventh Creation: Aśmā—stone
Eighth Creation: Iron, Copper etc.
Birth of Hiraṇya, gold
Agniḥ—Cause of Metals in General
Wet and Bald Earth
Bible
Ninth Creation, Plant Life
Urk—Source of Life
Creation of Seeds
Earliest Creation of Annual plants
Cellular Arrangement
Earliest Plants never dried up

23. Placing of Agniḥ on the Earth
Threefold Earth
Avoidance of Excessive Heat
Plants with dense Agniḥ molecules
Earth just like Lotus-stalk and Curd
Appearance of Clefts in the Earth
Earth appears shining at night
Atmosphere of the Earth

24. Antariksha
Mid-region, brilliant
Electricity and Lightning
Maruts and Magnetism
Field of the action of Maruts
Four kinds of Magnets
Earth surrounded by a Magnetic Field
The Cause of colour
Streams of mid-region
Earthquakes
25. Antariksha Continued, Maruts and Rains ... 273
  Robing of water and the action of rays ... 278
  Three causes of Rainfall ... 280
  Upper and Lower waters: Bible ... 283
  Apāṁ Napāt, Vayāṇśi ... 285
  Loose, Mid-region ... 286
26. Heaven and the Sun ... 288
  Word and the Three Worlds ... 288
  Rays and the Sun ... 289
  Not Bright at first ... 290
  Source of Rik Vibrations ... 291
  Veda Mantras 292
  Cosmos and its knowledge ... 293
  Noise in Jupiter ... 294
  Divine Horses ... 295
  Vibrations are Metres ... 297
  Fuel of the Sun ... 298
  The Rays ... 302
  Thousand Rays ... 306
  White and Black Rays ... 307
  Seven main Rays and the planets ... 308
  Heavenly bodies born of the Sun 308
  Rays again ... 311
  Motion of Rays ... 312
  Rainbow ... 314
  Mirage ... 316
  Ray reflection and Mirrors ... 318
  Gamow and Cleveland's suggestion ... 319
27. Adjustment and Settled Movement ... 320
  Motion, Side-ways ... 322
INTRODUCTION

Way back in Lahore, while I was a science student at the D.A.V. College, Svami Lakshmanananda, a yogi from my home town Amritsar, exhorted me to take to the study of Sanskrit. As a result thereof, after passing F.Sc., I joined B.A. with Sanskrit as an elective subject and took the degree in 1915.

As a student of Sanskrit I had been disappointed by the method of Sanskrit teaching then prevalent at the University. It was very faulty. Under the cover of ‘critical, scientific and historical’ method the ancient Indian lore was ruthlessly castigated and the minds of students poisoned against it. Consequently I refrained from joining Post-graduate classes.

My Sanskrit studies, however, continued according to the ancient Bhāratīya system, and my interest in these grew more and more each subsequent year. Besides intensive study of the ancient History of Bhārata, Vedic literature became my pet subject.

In due course I began to realize the great harm, which has been done by a group of occidental scholars to the cause of Vedic studies. Vedic texts, which are in reality a repository of Scientific Truths of the highest order, were awfully mis-interpreted. The so-called modern man failed to appreciate the existence of eternal truths in these “primitive books”.

In the June of 1922, at the age of 28, I married Satyavati Shāstri. She was the first girl to receive the Diploma of Shāstri from the Punjab University. Her knowledge of Sanskrit language was keen. She helped me immensely in my studies throughout the period that God allowed us to remain together. The first result of these studies was published in the form of three volumes of Vaidika Vānmaya Kā Itihāsa (History of Vedic literature).

The Seers—During all these years, I came across the highest reverence which was unanimously paid by all the ancient writers, teachers (ācāryas) and sages to the Rīgis or the human Seers of old. Who were these Seers? There was a class of them, who were endowed with the power of vision, were stainless of the impressions of rajas and tamas and saw the Truths face to face. Their inner eye was awake. When,
sometimes, the memory of a friend, who has passed away from this world, presents the very picture of him or her, and the picture is realized or even seen on account of the function of citra, then it is no strange a thing for an accomplished Yogi, who has crossed the limits of Time and Space, and has passed into communion with the all pervading God, to see the Truths of Nature face to face without the aid of outer senses. Such perfect Yogis or Seers saw and heard the Eternal Mantras. I found that the statements of these Seers, as well as the mantras they received in the recesses of their hearts, were all systematic and clothed in a definite and often a mystic technique. The key of that technique had to be secured. There is a passage in the Mahabharata:

स्तुत्यमशिन्ह देवाना देवा: सुब्रदा स्वयम्भुवा । शास्तिपर्वं ॥३॥

i.e., The Vedas were created by the self-existent Brahma, for the display of the superb qualities of gods in the universe.

The Science of Gods—The most ancient works of this science, the Deva Vidyā, are all obsolete now. However, enough has remained preserved in Brāhmaṇa works; but unfortunately the pandits in my country have altogether abandoned the study of these texts. The problem of bread and butter bars their way.

Mythology—This name was given to the science of gods by the ancient Greeks, who received its remnants from the Egyptian priests and the Brāhmiya savants of their times. The picture of this science as presented by them is hazy and in broken outlines only.

The Key—Gradually I gathered glimpses of the science in the ancient commentaries of Vedic works, in works of Ayurveda, in the Mahabharata, and in the ancient most parts of the Puranās. Further, I reached the conclusion that a deep study of the Sāṃkhya and Vaiśeṣika systems of philosophy is most essential. The available treatises of these systems, though sufficiently old, were actually based on the works of a hoary past, of Pancasikha, Āṣuri, Kapila, Uñaka and others, who were the expounders of the Vedic lore also. No doubt, the key of the cosmos lies embedded in the Vedas and the Brāhmaṇas. Leaving aside prejudice, modern science has to make experiments to verify the results.

Western Scholarship—The so-called ‘critical’ scholarship of the Sanskrit scholars of the west has created a hopeless mess of these facts by their unwarranted and pseudo-scientific
surmises. This will be evident in the course of many chapters of this book.

Mishap—Then came the fatal year of 1947, which witnessed the devastating effects of the deep British diplomacy and the continuous childish policy of the Indian National Congress in the political division of India. I had to leave Lahore, penniless and roofless. My studies would have come to an abrupt end, but for the godly help received from Miss U.M. Bozeman and Miss C.L.H. Geary (now Mrs. Norman Alexander). These gentle and noble ladies, even at the peril of their lives, rescued a major part of my library, located in my house in Model Town, Lahore, and sent it to Amritsar. Without the original Sanskrit texts, in which almost all important passages were underlined, and necessary notes jotted down, I would have been in quite a forlorn state in the matter of my studies.

First Flash—It will not be uninteresting to record the way in which, after years of travail, I first began to see the light. The highly scientific value of the observations of the Seers was realized. One day in the year 1952, I was teaching an Essay of Tyndall to my daughter Suvarchā, who was preparing for the F. A. examination of the Punjab University. It contained the following lines:

"This ball (the earth) has been molten by heat, chilled to solid, and sculptured by water."

I closed the book soon after, and began to ponder over an observation of the Seers, which I had already read. It was to the purpose that 'the Earth was at first wet and loose'. This difference of the two views aroused a feeling in my heart that I should deeply verify the standpoint of the Seers.

Veda-Vidyā Nidarshana—The result of my studies in this direction was published in March 1959, in the Hindi book, entitled Veda-Vidyā Nidarshana.

My studies did not stop there. In Dec. 1963, I published a booklet entitled "Extraordinary Scientific Knowledge in Vedic works", in English. Since then, I had decided to present a more connected view of the observations of the Seers on the subject of creation. The present book is a fulfilment of this idea.

General points about the book:—
1. At certain places the book is in the form of mere notes. I could not add any more material there, and so the use of imagination alone was deliberately avoided. Almost every statement is supported by a cogent authority.

2. When giving English equivalents for certain technical Sanskrit terms, I have used the word "corrupt form" for the corresponding word in the English language. Some of my readers may take ill of it; but I could not do otherwise. In spite of gigantic efforts on the part of some philologists to shield this truth, the fact remains there, and I could not go against it.

3. Portions of the book will appear quite dry to some of my readers. These contain Vedic passages and their translations only. It was essential to bring all such passages together to enable future workers for the advancement of knowledge. Moreover, it is an unswerved belief among Vedic savants that even a slight variant of a Vedic mantra does carry with it a different shade of meaning. It should not be regarded as a mere repetition.

4. The use of certain technical Sanskrit words was unavoidable. I could not find right English words to express the true sense of these terms. For example: Āpah is an earlier stage of water. It signifies a state in which the molecules pervade and are not compact as in water. What exactly is that state is yet to be discovered. So I have used the Sanskrit word Āpah in all such cases, where the word water did not convey the right sense.

5. The book reveals facts which do not support the unhistorical Marxist dogma of total progressivism. In the face of facts no obstinacy can avail. Long, long ago, in a hoary past, the sublime Veda-mantras began proclaiming the highest and subtlest scientific truths to mankind. Many of these truths are still unknown to modern science. How then can a man of science, with an open mind, accept misleading theories?

6. This book unfolds a way to the Ādhibhautika (of the Real Elements) and the Ādhidalvika (of the divine physical powers) exposition of Veda, which totally disallows all ingeniously coined "historical" data in these texts. It brings to light the pristine glory of Vedic knowledge and shows how the Vedic mantras emanate from Brīhaspati (Jupiter) and Sūrya (Sun). The authorities quoted so pro-
fusely, clearly indicate that these statements are not the mere outcome of the imagination of the author.

The first four chapters of this book contain the views of the ancient Bhāratiya authors about Matter, its various forms, and its properties. The properties are dealt with at length for the first time. It has further been concluded that the atom of modern science is neither the paramāṇu of the ancients, nor the atom of the Greeks. Paramāṇu is, in reality, an earlier and a simpler state of the atom of modern science, which is composed of a nucleus and electrons rotating in an orbit. The Bhāratiya and Greek conceptions appear to be similar. Suggestions have been noted down to fill in the gaps in modern science and to improve its modes of expressing facts.

As regards the Greek and Bhāratiya terms in the domain of philosophy, I have arrived at the conclusion that the Greek philosophers Democritus, Empedocles and Anaxagoras have simply translated many fundamental terms of Bhāratiya philosophy. These are: “Seeds” (śīla); “Roots” (dhātu); “Love and Strife” (bheda-saṁsarga); “Hot and Cold” (dvividhā laukika bhāvaḥ, śītāni uṣṇam iti priye), and so on.

The above conclusion will upset many of my western readers, who have, till now, suffered under the belief of “classical prejudice.” But one day the truth was to be unravelled. The world of the learned has to realize that the injustice done to the cause of Bhārata was to be washed away.

Further, in the pages of these chapters, the conception of the five Mahābhūtas has been cleared, and it has been shown that the elements of modern Chemistry are not the Real Elements. Agniḥ, the Mahābhūta, exists in the state of paramāṇus and molecules. As it has molecules which adhere to one another, so the usage of Sanskrit words: saṁśrīsto Agniḥ (80) and saṁmālalo Agniḥ (Rig.X. 6, 4). The paramāṇus of the four Real Elements are the basis of the cosmos. A side light on the astras of ancient warfare has also been thrown. This subject requires a separate volume for itself. The science of astras shows the way of producing Anti-atomic bombs. Certainly, every astra had its counter astra also.
From chapter V onwards the book is replete with passages from the Vedas and their Brāhmaṇas. The meanings of these passages are given, and the mistakes of as many as—sixteen—Western translators or their followers have been pointed out. They are: Caland F. W. (105, 116, 160, 238, 241), Chatterji K. C. (257), Eggeling G. (105, 160, 241, 242), Geldner (88, 103, 257), Griffith R. T. H. (88, 90, 103), Hopkins (262), Keith A. B. (110, 262), Ludwig (262), Maconochie A. A. (93, 156, 263, 285), Muir J. (90), Oldenberg H. (183), Raja C. K. (276), Roth R. (152), Velankar H. D. (191), Whitney W. D. (184, 240, 281) and Wilson H. H. (191).

In these chapters the Vedic story of Creation has been compared with the available allied accounts of the Egyptians (109) and the Jews (110, etc.). Both have borrowed directly or through succession from the Vedic knowledge, which was prior to them by thousands of years. The Vedic compound dyaṛābhūmi or dyaṛāprthivi has been translated by both in the same succession of words as: “heaven and earth.” The importance of The word (Veda and Bible) in connection with creation has been brought to light. The proximity of Heaven and Earth, the appearance of the mid-region and the pushing up of the Sun are stated in clear terms. Various creations on this Earth, and the passing downward of Aṅghī molecules to its core are related. The mid-region is not mere space, but is the abode of various physical powers or gods, which cause electromagnetic currents, is shown. The fascinating working of the Maruts (cosmic rays?) is also disclosed.

It is said that the fuel of the Sun will endure till the end of the present cycle. The Earth and the Sun, when separating, entered into a contract on this and other points. The source of the heat of the Sun is water, which rises up from the Earth in the shape of vapours, passes through the mid region, absorbs its electricity and again rises in the form of Āpaḥ molecules toward the Sun, and strikes and breaks on its surface into hydrogen, helium and other substances. The Sun is the cause of both hot and cold waves and sends rains to the Earth. The phenomenon of rain is very briefly described.

Nature of the rays of the Sun is also related. Heavenly bodies separated from the Sun and the Nakṣatras were hot like the Sun at first. They cooled down later. All these interesting phases will be found in these chapters.
Other important items can be noticed from a perusal of the contents. Every thoughtful reader will feel the great necessity for a fresh translation of the Vedas, so that the world at large may avail of the treasures of immense knowledge.

I have stopped here. The account of the four more worlds, which are beyond these three, and are the abodes of countless galaxies has not been given. The subject of the stars of our own galaxy, their origin, and the single ray (ekaraśmi) they radiate, is not touched.

This brief survey will make the reader realize that Veda, the book of knowledge, well deserves its name. Its deep and unbiased study is a great desideratum in the way of healthy progress of science.

The Story proper has been related in a very brief manner. Four volumes of the size of the present one, and a deep study for ten years more would have enabled me to do real justice to this subject. This required a tiresome patience, for which my health is not ready. My wife died on 14-1-67, after an illness of two days, and the sincerest help in the preparation and printing of the book was over for ever. Anyhow, as the book was already in the press, I decided to see it printed.

The work with the first press was not smooth, and over and above this it closed down in May, 1967. The next press was slow. Both presses suffered under the deficiency of types with diacritical marks. So this feature of the book is not encouraging, and the transliteration of Sanskrit words is not homogeneous. For a few mistakes of print, and some slips of language I beg pardon of my readers.

In the end I have to thank all the authors, whose works I have used, and especially the late Sir Brajendra Nath Seal, the author of “The Positive Sciences of the Ancient Hindus” (1916), who pioneered in a part of this field.

And now my duty of expressing my gratitude. The greatest help in all my researches for the last four years is from Śrī Narayana Swāmiji, the custodian of many śāstras. His constant encouragement, parental care, and fruitful consultations keep me going on for this sacred cause. But, for his help, it was impossible to publish three books during the last four years. Then is my esteemed friend Śrī J.N. Sharma, who opened the way for the printing of the book, with a substantial
contribution. Shrimati Shanti Devi and her son Adarsha Ratna, Malhotra, also gave timely help with money. I cannot here forget the encouragement which I always receive from my friend Sri Om Prakash Vaidya-Vaeeaspati. Sri Asvini Kumar M.A., and my son Sri Satya Shrava have often been reading the proofs and helping me with valuable suggestions. My esteemed friend Sri K. Narendra, the editor of the dailies Hindi Vira Arjuna and Urdu Pratap of Delhi, with his love of knowledge has evinced keen interest in the publication of the book. His effort brought me help for the paper of the book from the Hindu Dharma Sangha of the late Sri Jugal Kishore Birla. The indices are the work of Sri Asvini Kumar. And last but not the least of all is my old colleague and friend Professor Sant Ram Sayal, who has taken great pains in going through the book and improving it at many places. My sincere thanks are due to them all.

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SRI NARAYANA SVAMI
The Great Scholar
THE STORY OF CREATION
AS SEEN
BY THE SEERS
CHAPTER 1

PRIMORDIAL FORMS OF MATTER

Veda and Sāmkhya—In order to understand Vedic technique it should be remembered that Vedic knowledge is the oldest exposition of the Sāmkhya conception of matter. And Sāmkhya is nothing but science. The English word SCIENCE descends from the Latin word Scientia, which again is only a corrupt form of the Sanskrit word Sāmkhya. It is, however, strange how the last two letters (ee=se or ka) of the English form of the word have partly preserved the ‘kha’ sound of the Sanskrit original.

Matter—Bhūtas or Tan-mātrās will be dealt with later on. But it is, here, necessary to point out that the English word MATTER is only a corrupt form of the Sanskrit word mātrā. The old French form of the word matere is equally clear and indicates its indebtedness to the Sanskrit word.

Now, Sāmkhya and Vaiśeṣika systems of Bhāratīya philosophy have given us an idea of Prakṛti and its various subsequent transformations into Bhūtas and Mahābhūtas.

1. Prakṛti—the primordial cause of the universe, is the primary category, which is accepted by the Sāmkhyas and is remembered under the names of jyeṣṭha, X. 120. 1; tamaḥ, X. 129. 1 and svadha, X. 129.2 in the Rigveda.

2. Mahān—Prakṛti’s next transformation; Mahān, is

\[ \text{३१०० B. V.} \]

1. प्राचीनाः पृथ्विसद्वपिपासु� | सौधायास्य उपनिषद् ३ । ३ ॥
reminded in a Rik, quoted in Śatapatha Brāhmaṇa, II. 5. 1. 5.\(^1\) (3200 B. Vikrama) In an enigmatical verse of the Rigveda (I. 164. 31) the Mahān is explained as revolving again and again in the worlds [in the course of creation and annihilation.]

Brahma, Satya, salila are some of the synonyms of Mahān,\(^2\) which have been recorded by Yāskā.\(^3\)

Mahān resulted into Ahamkāra, and this gave rise to Tānmātrās.

3. Tān-mātrās—The Bhūtas or Tān-mātrās, which came into existence after Ahamkāra, are a mass of paramāṇus or “ultimate” atoms.\(^4\) Śatapatha Brāhmaṇa speaks of the Agni-mātrā, as also many other Upaniṣads.\(^5\) The Tān-mātrās are five in number. The Bhūtas are also called Dhūtās or the roots by many authors.

A Rik in Support—Three sanhitās of the Yajurveda read the following Rik, which very clearly describes the Tān-mātrās and their functions in the story of creation:—

\(^1\) भूतं गृहीतं महतं पुरुषं।

\(^2\) The Rigveda text has the reading ‘Brāhat’ instead of ‘mahat’ of the Sat. Br. The Br. had certainly some other Rik Sakha in view.

\(^3\) This important Rika is explained by Yaska, the greatest authority on Vedic exposition, in Nirukta XIV. 3. Some writers have doubted the authenticity of this appendix portion of the Nirukta, on account of its containing material, which they dislike. Their prejudiced desire is not fulfilled. I have proved in my Introduction to the Translation of the Nirukta that the appendices are an integral part of the text.

\(^4\) तस्मात् भूताःर्थम्।

\(^5\) ग्रह जृहत।

\(^6\) Pṛthvī Śānti. 37211. द्रव्यः हिंतिष्ठो नितिष्ठ।
Translation—From the five [Tan-mātrās], the creator created, whatever is, and gave birth to their sisters [co-existants], the five [senses], and the five [Mahābhūtas.] Of these five [Mahābhūtas] are the combinations, which assume numerous forms, wearing various [garments of] actions.

4. Mahābhūtas—Leaving aside the first one ākāśa, which is without particles or molecules, the Mahābhūtas are combinations of paramāṇus. With the Mahābhūtas begins the stage of creation, wherefrom substances become perceptible.

5. Paramāṇu—This word is found used in Yogasūtra I. 40. Here it is stated that the citta of a yogin finds its place in a paramāṇu even.² Vatsyayana=Kautalya (1400 B.V.) also uses this term.³

Citta—This substance is unknown to modern western psychology, which has not yet advanced beyond the range of the five external senses. Citta and its inner associates, Manas, Buddhi and Ahamkāra play a great role in the grasp of direct knowledge. Therefore, the observation of citta, as related by a yogin, is extremely scientific.

Seers—The greatest yogins or seers see with the divine eye; their pronouncement is not contradicted by any inference. This is, what the great logician, linguist, philologist and gram-

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1 cf. मेवादसौ ।
2 लेखिवादिनीगुरे गुप्तापूर्वस्तु पर्यक्षु पर्यास्परापूर्वस्तु संधमातृ तत्स्र तत्स्र रुपस्त्र वर्णसङ्केत । ब्यासिकाः ॥ ॥ वर्णवाच्यश्च दोषिनां शरमातः । वाक्षिदितिपूर्वः, पूर्व १४ ।
3 बस्तव्य नाल्दीयोजः तः परमात्मत्र प्रचलितेः हृत्ति । ब्यासिकाः ॥ ॥ ॥ ॥ ॥ ॥
marian Bhartri Hari (earlier than 3rd century of Vikrama) has remarked.3

The truth in the observation of a yogin will be evident in the following pages.

6. Different kinds of Paramāṇus. The paramāṇus are of four kinds,3 i.e. of Vāyu, Agniḥ, Āpah and Prithivi. They have their distinct and separate forms. Their different types and modes of actions are found described in many philosophical works, and are briefly enumerated here.

(a) Without parts or Molecules—The paramāṇus are nir-avayavah,4 i.e. without any parts. On the other hand, the present day conception of an atom, depicts it as composed of :

(i) “a tiny nucleus which is positively charged and contains nearly all the mass of the atom. Distributed about the nucleus and revolving about it in orbits are much massive negatively charged particles called electrons.........the atom as a whole is electrically neutral.”5

Thus it is clear, that an atom is a compound of positively and negatively charged particles. It has a nucleus (garbha)6 and

1 भ्रतीध्रान्न प्रसविनार् पञ्चवत्याध्यः चहुदा ।
बालवानं धर्मं ते सा नातुरामेन बाष्यले । वायुधातिय । १ । ३० ॥

2 मर्यादात्म हित । चतुरिक्षः : परमाशयः । वायुधातिय । १ । ३० । ठीकः ।
चतुरिक्षः : परमाशयः ज्ञित-जलामिन-गारूनाम । वाराहमिहिर, चूहस-हित । १ । ७ । उत्तर ठीकः । प्रत्यक्षमयः : शीतेश भ्रष्टपरमाशयः ।
विष्णुपुर । २१२।१४ ॥ पारिवर्तः : परमाशयः । विष्णुपुर । २१२।१४ ॥

3 निरवर्तः : परमाशयः । व्यक्तमयः, पूर्व । २२५ ।
The Jain view is a reiteration of the same :—

4 स्कन्धसङ्कल्पमयः । श्रद्धां भृकुटिते हृत ॥

5 निरवर्तः । प्रत्यक्षमयः । श्रद्धां भृकुटिते हृत ॥

7 Cfr. गर्भ यो अयभास । झूठ । १ । ७० । २ ॥
an outer circle of electrically charged electrons. It, therefore, can not be expressed by the Sanskrit word *paramāṇu*, which in itself is a simple indivisible entity.

This view is further supported by the following statements:

(iii) "it was clear that at least the nuclei of heavier elements did have a structure, that is, consisted of smaller “building blocks.” For example, occasionally a nucleus of radium disintegrated spontaneously into a nucleus of radon and a nucleus of helium."\(^1\)

"Thus, the radium nucleus was not a “simple particle.”\(^1\)

(iii) "It then became clear that nuclei consist of protons and neutrons;\(^2\)

This strengthens my viewpoint that the ‘atom’ of the physicists is a mixture of many independent structures, and is not the *paramāṇu* of the Sanskrit writers, which is a single indivisible unit.

(b) Without intermolecular or inter-‘atomic’ space—When a *paramāṇu* is an indivisible whole, the question of its intermolecular space does not arise. Still, the *Vyāsa-bhāṣya* makes it quite clear and states:

\[\text{प्रयुत्तिनिद्दात्वः संचात्त: संब्हिताम् परमाणुरिति ।} \]

i.e. with no separable union of molecules, a compact whole is a *paramāṇu.*\(^3\)

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2 Ibid. p. 15.
3 This passage was first noticed by B.N. Seal, in “The Positive Sciences of the Ancient Hindus,” p. 45. The phrase *प्रयुत्तिनिद्दात्वः* is also used in the *Padartha-dharma-samgraha* of *Prasastapada*, p. 58, and the sukti commentator on it, translates it as:

\[\text{प्रयुत्तिनिद्दात्वः संबंधा मिष्ठ: संब्हिताम् परमाणुरिति ।} \]

Again, Cakrapani, the commentator of *Caraka samhita* writes:

\[\text{प्रयुत्तिनिद्दात्वः संबंधा मिष्ठ: संब्हिताम् परमाणुरिति ।} \]
(c) Circular—*paramāṇus* are circular or spherical.

(d) Smallest—The *Vyāsa* exposition of *Yogasūtras* remarks in another context, that "the smallest part of matter is a *paramāṇu*." *Vātsyāyana* also expresses this idea in almost the same strain. The *Pāśupat Udyotakara*—the great logician, who brought down the fame of the Buddhist logician *Nāga-Arjuna*—holds the same view.

(e) Yet a hundred times grosser than Mahān—*Vāyu-purāṇa* says that ten times grosser than Mahān is Bhūtādi or Ahaṁkāra; and a *paramāṇu* again is ten times grosser than Bhūtādi. Thus Mahān is $1\frac{1}{10}$ times subtler than a *paramāṇu*. This comparison appears to be from the view-point of relative subtlety. It is further stated there:

(f) Imperceptible—A *paramāṇu* is extremely minute, is conceived by *bhāva* (=inner sense experience), and not by the naked eye. That which is the minutest indivisible in the world should be known as *paramāṇu*.

P.A.M. Dirac's view of "extraordinary" electrons, whose 'presence escapes any possible experimental detection", is a step further than the fact of the existence of an atom; but it is not all. The four kinds of *paramāṇus*, seen face to face by the seers, are the ultimate realities of the *Tan-mātrā* stage. The idea of positively or negatively charged particles, requires scrutiny.

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1 परिमण्डल्याः परमालेवः। व्योमवती, पृ० १९१
2 प्रकर्ष्टिकां श्रवं परमालेवः। १३ १३ २२
3 वतन्त्र नालपीयोपिनि तं परमालेव प्रचक्षते। १६ १६ २२ २२
4 सर्वराजसतमतां श्रवंकाष्ठमम्। संप्रत्यतः। परमालेवः। १३ ।
5 ज्ञानविनाशको भावार्द्धों न चतुष्याः।
6 गामोव, p. 410.
It is possible that Āpaḥ paramāṇus are negatively charged. It is these that pervade the whole universe, as their very name indicates.

(g) Formless and yet with a form—I have stated in (c) above that a paramāṇu is spherical; but the Vāyupurāṇa in some very important verses states that a paramāṇu has no shape, and yet it is with a shape (=mūrtimāṇa).

Mūrti and Rūpa—The difference between these two terms is important. Mūrti is shape or solidity and rūpa is something which gives the idea of appearance, colour or form. As regards shape (mūrti) Vyomasiva says:—“mūrti is the size of a confined substance.”

Some of the other qualities of a paramāṇu, as enumerated in the Vāyupurāṇa are, undecaying, inconceivable, with appearance and disappearance etc. A paramāṇu is also termed as maheśvara or supreme, i.e. endowed with all powers.

On account of the importance of this statement of the Vāyupurāṇa, I reproduce in the footnote below the necessary verses from it in toto.

1 Mūrti:—अथ्यापित्यप्रविष्टमाणुम् | व्योमवतीं, २० १५४ ।
cf. Vacaspati on Yogasātra, III. 44
Mūrti: संविदिकं कालिन्ययम्,
but this cannot fully apply to a paramāṇu.

2 (a) सूक्ष्म: प्रस्वचरित्ययस्त: प्रकृतय: संवता: ।
ब्रह्मोदिकानण्डो तस्योऽश्च क्षेत्रश्च प्रक्षेत: ।
तातु प्रक्षेत्रस्तूपस्तूपां ब्रह्मिष्ठात्मकम्ययम् ।
प्रचुपास्य परं चास्म परमाश्च परस्याक् ।
प्रक्षेत्रस्तु स्तूपस्तूप: ब्रह्मवर्त्तित्वमयमानिः ।
प्रदूषितस्तिरोर्भव: विष्णुविष्णुवेष्ण: ।
विष्णुविष्णुवेष्णाय: परमाधुःभव: ।
सतेः एव लेम्बोऽस्मि यः पुरस्तात् प्रकाशकः ॥
**THE STORY OF CREATION.**

**Rūpa**—The *Vyāsabhāṣya* accepts a rūpa—form of the five kinds of Bhūtas.

Vyomasiva says that the colour of the *paramāṇus* is imperceptible (to the human eye).

Form and imperceptibility—This fact of not being perceptible to the senses is further made clear by Jayanta Bhatta in his *Nyāya mañjari* :

How, then, the *paramāṇus*, which have a form, are imperceptible to the senses?

His interesting answer then follows, which should be studied in the original text.

(h) A molecule—Although the highest indivisible particle, yet in its turn, a *paramāṇu* is only a molecule in a Tan-mātrā. This marvellous truth, which reveals a great fact, is the meeting place of the Sāṃkhya and Vaiśeṣika systems of Bhāratīya thought. We find this stated in the *Vyāsa bhaṣya*, as already quoted in footnote 3, of article 3, above.

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1. *भृतेय गुणयुक्तम् पद्मचक्रपेषु ॥ १ ॥ ४४ ॥
2. *परमाणुवाक्यायाम् प्रसर्यक्ष्यतात् ॥ पृ० १५१ ॥
3. *कप म कप्तनास्यि श्रेयश्च: परम्परात्: ॥ पृ० १२४ ॥
4. *तन्मात्र भूतकारणं तत्त्वाकोशवः: परमाणुः वामायनिष्ठेऽविभागः स्पतिविद्यायवाचनुः समुदायः: ॥ ३ ॥ ४४ ॥
(i) Motion and the property of encircling—The para-
māṇus are active and remain in motion, and possess the pro-
erty of encircling, revolving or separating. The property of
motion is due to their union with Ātman (=Mahān). And
without motion no energy (=in reality Karma or action) is
ever possible. 8

Western surmises about motion—The following passages
from the book, “The Magic of Rays”, will not be out of place
here. I quote and examine them:—

1. "How does one supply an atom with energy?.......
One way, for example, is to use heat." p. 26.

2. "The atom is thus very fastidious. It absorbs only
energy that corresponds to "its nature"." p. 27.


These lines contain the following statements:—

1. Heat supplies energy to an atom.
2. The atom is fastidious i.e., easily disgusted.
3. An atom absorbs energy.
4. Atom absorbs only that energy, which corresponds to
its own nature.
5. Heat and movement are synonymous.

Examination

Of these five,
1. The first statement is correct.

1 सामान्याभावातुं प्रभावकारणात्मकोत्तर: परमात्मास्वाभावकारणात्मकोत्तर: इति।
बैशाखिक मूस, प्राज्ञातकुलसूत्र दीक्षा, व. १, १, ११।
Cf. प्रत्ययंप्रभावकारणात्मकोत्तर: परमात्मानुपाय दीक्षा। ततोबैशाखिकमार्गस्री
सिद्धांतिरस्मिं। पदार्थार्थकारण, सेतु-दीक्षा, पृ. २६८।
2 परमात्मानुपाय वेदकर्मणी भ लिख्य: "...वेद विना कमलमार्गस्री:।
सेतु-दीक्षा, पृ. २६६।
2. The second also is correct.

3. The third statement is against facts. It is due to a misconception of long standing. 'An atom absorbs energy', is on the very face of it a confused statement.

Energy is only a property; nay, no more than a property. And a property must have a substance at its back. Unless modern scientists discover that substance, their statement will be regarded as illogical.

4. This part of the statement shows that the atom has in its nature a kind of energy. This energy should correspond in its nature to an outer energy, and then the outer energy is absorbed by the atom.

This asks us to believe that one energy is in the atom, and the other energy is outside that atom, rather without the support of any other substance. Such a conception is absurd. Every energy (=Karma) is in some one atom or the other. Hence, a real scientist should say that 'an atom absorbs another particle, which contains energy of a corresponding nature.'

The above discussion will be further clarified from the following observations:—

The seers say that heat is nothing but the result of the paramāṇus of Agniḥ. They combine into molecules of a certain type, and cause heat. They give rise to 'energy'. So, if the statement is to be logical, we should say that the atom, which is not a paramāṇu but is a compound of paramāṇus, does contain an Agniḥ paramāṇu, may it be in the nucleus, which possesses a certain kind of energy. And the outer energy, which is in another Agniḥ paramāṇu is absorbed by the previous atom along with the paramāṇu itself.

5. Different kinds of Energy. These are due to the different arrangements of the paramāṇus of Agniḥ. Some of these
cause heat, others light, and still others electricity and magnetism. Of these, the heat paramāṇus cause motion.

Nor is this all. It should be remembered that there are paramāṇus of Vāyu also. Individually, these had, at first, during the earliest phase of creation, no contacts with the paramāṇus of Agniḥ, and yet they enjoyed the inherent property of motion. Besides Agniḥ and Vāyu, motion is inherent in the paramāṇus of Āpāh and Prithivi also.¹ In reality motion is the property of all the four kinds of paramāṇus.

This motion, began in the beginning of creation,² on account of the contacts of these paramāṇus with Mahān.

As western science has not been able, till now, to differentiate between the four kinds of paramāṇus, it has not been able to reach at the reality.

Paramāṇus or molecules vibrating even in themselves do not give rise to a vibrant whole. Therefore, the paramāṇus in motion do not cause the whole, which may be composed of them, to be in motion.³

7. Properties of Bhūta Tan-mātrās—These are indicated by the expressions, active, not formidable, and purposeful.⁴ The exact exposition of these terms is yet to be determined. A passage from the Mahābhārata, however, will help in grasping the true nature of the Tan-mātrās:—

¹ भाध्यायां दास्यां नास्ति भाद्रेव: सागरे यथा। शास्तियय पृ१। १६॥
² समाध्यायां दास्यां नास्ति भाद्रेव: ॥ जी० सूर्य दौ। १। ५॥
³ भाध्यायां दास्यां नास्ति भाद्रेव: ॥ १। २॥ १॥
⁴ भाध्यायां दास्यां नास्ति भाद्रेव: ॥ १। ३॥
THE STORY OF CREATION

i.e., Mahābhūtas originate from the Bhūtas, just as waves originate in a calm ocean.

Waves—Waves are nothing, but the ocean itself. The ocean water vibrates with sweeping motions, and causes the waves; similarly the paramāṇus become violent or formidable and give rise to the Mahābhūta stage.

Synonyms of Tan-mātrās—In the Jayamaṅgalā commentary of the Sāṁkhya saptati, we find the following line:

सूक्ष्मक भित्तिया भ्रणव इति तन्मात्रपययियाः । २२।
i.e., sūkṣma, atisayah and anavyah are the synonyms of the Tan-mātrās.

8. Mahābhūtas—These are really molecules in the Tan-mātrās. As stated above, they appear as waves in the Tan-mātrās. Originally the paramāṇus in the Tan-mātrās, though extremely active, are not formidable or violent; but under changed conditions, as soon as they assume the form of the Mahābhūtas, they become formidable.

Mahābhūtas and Mahidāsa—Mahidāsa Alitareya (3400 B. Vikrama), the teacher of the Alitareya Brāhmaṇa accepts the existence of these Mahābhūtas:—

इत्यादि च पञ्चमहाभूतानि पृथिबी वायुरकाश भ्रापो ज्योतिष्ठनि।
इत्यादि च शुद्धिमयानोऽव बीजानि। ऐ० उ० २१३।

i.e., these five Mahābhūtas are Prithivi, Āpah etc.; these, as if mixtures of tiny [particles], are seeds [of the universe].

The later part of the text is not very clear. The printed reading and its commentaries are not helpful. I have adopted the text of the Poona edition, which is more authentic than other printed editions.

1 तातीमानि चुरायौक्तकारवति भूतानि भवन्ति। ऐ० ५५, १०० ६।
Properties of the five Real Elements—Now, before proceeding further, it is important to know the properties of the four kinds of paramāṇus, and of the fifth, the all pervading ākāśa Mahābhūta. The true nature of the phenomenon of the universe can be understood only after this. Every molecule, every atom, and every paramāṇu, and all the combinations of molecules etc. have a story at their back. And once the back is grasped, the various forms of matter tell their own story. The properties of the paramāṇus and their subsequent transformations are the real key-note for a real knowledge of the working of matter.

Importance of Properties—These are the properties which differentiate paramāṇus of one real element from the paramāṇus of other real elements. Patanjali, the master of acute intellect says;—

भैद्य कुण्डः। भ्याकारणमहाभाष्यम् १ १ १ १ ॥

i.e., the properties are a distinguishing or a determining feature. Not this alone, they further help:—

इति कडाचिद्र गुणो गुरुविशेषको भवति । तत्तथा पतं: शुक्ल इति । कडाचिद्र गुरुणा गुणो व्यपदिशते । पटस्य शुक्ल इति ।

महाभाष्यम् १ ४ ४ २ ॥

i.e., in this world, at times, a property serves the purpose of distinguishing one object from the another i.e., cloth white. It is used as an adjective of a noun. And again, at another time, by a substance, which possesses a property, the property is designated, i.e. of the cloth, white.

Divyāvadāna, a Buddhist work, notes different kinds of Aruṇa—reddish brown:—

प्राभः । नीलाभः । पीताभः । ताम्राभः । माकान्दकाव्यां, ३६।

i.e., blue—Aruṇa; yellow—Aruṇa; copper-coloured—Aruṇa.

¹ Cf. केवल विशेषतः निविद्ध-संक्रोचनां विकाशां स्निश्चयं च।

पदार्थं सं, सैद्य दीक्षा ३० २६१।
Properties never create a substance—It is a plain fact that substances give rise to substances only, but properties never create a substance. Length, breadth and weight are properties. Keeping the above fact in view, no sane man on the face of the earth will ever say, that length and breadth have created a book, or a log of wood, or a wall, or further still, that length is travelling. In reality properties get converted into properties only. This fundamental truth is the basis of all science.

Hence the great Kanāda said:

द्रव्याणि द्रव्यान्तरमार्गन्ति। १।१। १८।१।
गुणाणि गुणान्तरस्। १।१। ६।१।

i.e., substances give rise to other substances.

Properties [give rise to] other properties.

What are heat and light—Heat and light are the properties of the paramāṇus or molecules of the substance Agniḥ. Therefore, an improvement is required in the modern books of science, in relation to expressions about the working of heat and light. For example:

"Heat conduction", 1 "heat to flow", 2 "Light Emission", 3 and "velocity of light", 4 "wave nature of light", 5 "properties of light" 6 etc. are expressions which require change.

It is true that water flows, but heat is not like water, which should flow. The expression,—‘heat is energy’ is some what correct, but it should be understood, that this energy due to the paramāṇus of Agniḥ. So in a purely scientific

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1 Gamow and Cleveland, p. 158.
3 Ibid, p. 277.
5 Ibid, p. 287.
language, we can say, that *Agniḥ paramāṇus*, in a special molecular arrangement possess an immense velocity, and cause light. Light in itself does not propagate through space, but *Agniḥ paramāṇus* propagate through space. This will be further clear later on.

**Einstein**—Earlier scientists mocked at this idea. It was to them an "old-fashioned" thing; but thanks to the deep insight of Einstein who realized and said, that—"matter and energy are indistinguishable."¹ Still further, thanks are due to the latest researches of the followers of Max Planck, scientists have come to know of photons—the light particles.² Gamow and Cleveland also remark,—"light is emitted a photon at a time by separate individual atoms".³ These *energy quanta* or *energy particles* are really *Agniḥ* particles. I may here add, that energy also is not a fully correct term for these *Agniḥ* particles.

In short, the reality of the properties should never be forgotten.

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¹ The Universe and Dr. Einstein, p. 10.
² The Magic of Rays, p. 33.
³ Gamow and Cleveland, p. 270.
Chapter II

Properties of Matter

Real Element Prithivi=original earth, and its subsequent forms

Matter according to the seers exists in the form of five elements, i.e., Prithivi, Āpāh, Tejas, Vāyu and Ākasa. The modern Chemists and Physicists used to believe that gold, silver, iron, sulphur, oxygen and hydrogen etc., were all elements, for they defied any analysis. But with the discovery of the atom and the progress of nuclear physics this view has undergone a marvellous change. Uranium, thorium, radium, polonium are the so-called elements which slowly and slowly get reduced to lead. These have been analysed. Yet the scientists are using the term elements for them. They have announced the number of these elements as 101.1

The reason, for the inability of the scientists, to use a better term is evident. European languages do not possess a diction, capable of representing all the truths of Nature. Therefore, a word which had a meaning of its own for centuries is now being used for substances (—dравyas) whose structure contradicts the essence of that very meaning.

Under the above circumstances, I have, used the term Real Elements for the Mahābhūtas.2

If, therefore, the term element has to be used by modern

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1 Gamow and Cleveland, p. 401.
2 महाभूताः=प्रत्ययः=विजेत्या=खातवः। ब्रस्मिकुम्यालं सूचिष्टितो श्राध्वचोदिताः। हृदिभं, १६०॥१६॥ वतोः
ब्रस्मयश्चेते विजेत्या विभयते-इस्थानायाचायाः। वै० टोका, १२०॥१६॥
science, the term should represent electrons, protons, neutrons etc.

I. Two forms—Prithvi exists in two forms, the causal and the effect one.¹

[Sources. (1.) Yukti Dipika, an ancient Sāmkhya work, p. 141. (2.) Vācaspati’s commentary (898, Vikrama) on the Vyāsabhadāya, III. 44. (3.) Nāgoji Bhaṭṭa’s vritti on Yogasūtras, III. 43. (4.) Mahābhārata, Sāntiparva, ch. 261. (5.) Caraka Sāmhitā, sūtra, ch. 20; śārīra, ch. IV. 12.]⁴

(a) भाकारो गोरवं रीढ़ां वरण स्वैयंमेव च।
स्वतिमेव: क्षमा कृष्णव्या सर्वोपस्योयता। सुक्ष्मिदीपिका।

Variants in Vācaspati:—

(b) भूतिमेव: क्षमा कार्यी काठिंयं सर्वोपस्योता।

(c) सूस्यं स्वैयं गुहतं च काठिंयं प्रसवाश्च।
गन्धो भारवभ शक्तिश्च संचाल न्यायणवते हृति।

(d) पृष्ठेत्यालमकं……..गोरवं स्वैयं मूलित्वेव।
चरक सौ, शारीर, ४। १२।

Now, I will take them up one by one.

1. Akāraḥ—form; all matter, which has assumed shape or form, is the result of this property of Prithivi. Vātsyāyana—Kautalya writes in his commentary on the Nyāya-sūtras:—

सत्वावयवानां तद्वयवानां च नियतो वृहूः प्राकृतिः। २। २। ६। १।

i.e. form is the particular arrangement of the molecules of a substance, as well as of the further molecules of the molecules themselves.

Nāgoji explains:—

भाकारोववस्थान-विवेष:। योगबृत्ति:। ३। ४। ३।

i.e. form is a particular contact of molecules.

¹ परमाणुक्षेत्र निर्भयः। कायेलक्ष्यः त्वनिश्चयः। प्रस्तर, ४। २। ६। १।
² Cf. also the com. of Raghava Bhatta on Sarda Tilaka, 1. 27.
The paramāṇus of Prithivi, howsoever small their fraction, do confer shape on different material objects. The form of the sun, the moon, the forms of ants, cows, men, plants and trees are all due to the arrangement of Prithivi paramāṇus or molecules.

Primordial Seeds—These molecules, along with the molecules of Āpah etc. arrange themselves in the sperm, the plant seeds, and other objects and shape their offsprings in different ways.

The sage Vṛddha (3000 B. Vikrama) beautifully describes this act:

मनुष्यल पयः सतिमृतसानि लवण गुढः।
धान्यानि फलमूलानि मृदु-विकारा: सहाम्भसा।।
शालिपर्व २१४।१६

i.e. honey, oil, milk, clarified butter, different kinds of flesh, salt, molasses, cereals, fruit and different roots, are all the transformations of earth in union with Āpah.

Form, due to close union of molecules—The Mahābhārata further clarifies the origin of form. Amongst the properties of matter in general there is a property called samghāta or union of molecules:

1 Cf. Sushruta, where the six tastes are said to be the results of the divisions of the one main Āpya rasa, scorched by its contact with the remaining Real Elements:

स बल्यप्यो रसः लेवमूलसंसर्गादी द्वायः पोष्य विभयते।
लघ्यः—मधुरोस्मलो लवणः कटुतिस्तः: शगय इति। सू० ४२।४।१।

The exact composition of these six kinds is further clarified in a passage of Pāṇḍita Prānaprada (earlier than 8th century A.V.) in his commentary on Prapancha sara, II, 31, 32:

प्राप्रापिको मांसः, वार्तापिको मान्तः। मूलात्मापिको लवणः।
वार्तापिको शिक्षः। प्राप्रापिको, उप्योः, वायु-स्वाविको कष्यः।
तथा—चरक सं०, सू०, २६।४०।१।
PROPERTIES OF MATTER

\[ \text{गुणस्वेच्छःपरस्तत्र संवात इति प्रोढः।}
\]
\[ \text{शाक्तिव्यक्तिरित्येती गुणा यस्मन् समाभिः॥}
\]
\[ \text{शान्तिपरम्, ३२९४०७॥}
\]

i.e. another property is there, the union or cohesion [of molecules]; and form and individuality, the two properties, rest in it.

Form, not eternal—Sage Patahjali's (circa 1200 B.V.) observation is also worthy of consideration in this matter. He says:

\[ \text{ब्राह्मणिः अतिरिक्। तदषि नित्य यस्मिस्तत्वं न विनियते।१}
\]
\[ \text{महाभाष्यम् १११४॥}
\]

i.e. form is perishable. Only that is eternal, where the Element does not perish.

The change in the order of the molecular arrangement can cause a change in the form. This phenomenon being very uncommon, the things perish and the form ends.

2. Gauravam — gurutvam — mass, gravity. The English word gravity is only a corrupt form of the Sanskrit word gurutva. This property bestows the power of stability or dwelling on different objects. It is said:

\[ \text{गौरववाख्याम् गृहस्यानम्। युक्तिदीपिका।}
\]
i.e. the objects become stable or take their place on account of gravity.

Gurutva is the cause of the things to be thrown up. Air etc. which are void of this property, cannot be thrown up:

यदा हि देववद्यः प्रयङ्गः करादद्वित गुरूतवस्तः पाषाणादिकस्म उत्त्सर्पति, तदोक्ष्ययैः पाषाणादिगतं गुरूतवं कारणम्।

Gurutva is the cause of the things to be thrown up. Air etc. which are void of this property, cannot be thrown up:

Price.

Mass—The word gurutva may also be translated as mass. Prithvi element is an outcome of the tamas part of Prakriti, and tamas gives rise to gravity and the power of covering. It is, therefore, stated:

गुरूतवस्ते तमः सांख्यकारिका, १३।

Bhāratīya astronomers opine that objects fall on the earth on account of its gravity. The opposite of guru is laghu or light. The cause of the letters “gh” in the English word discloses its indebtedness to the original Sanskrit word.

Bodies of great mass do not fall, sometimes—Its cause has been noted as follows:

स च द्रायो-उपेत्रो भिन्नरूपं वेगसंबन्धात् गुरूतवस्ताम् रप्पत्तनु-तुम्बवति। व्योमवती, पू १००।

i.e. The extreme momentum, [created by Vāyu] in the beginning, becomes the cause of no-fall of massy bodies.

Sun’s rays, void of gravity—The Vaiśeṣika sūtra, commentator Chandrānanda says:

प्रादित्यसमीयाम् गुरूतवात् १२।१२।। चन्द्रानन्द टीका ।

i.e. the rays of the sun are without gravity or weight.

The question now arises, if the rays are without mass? Its answer should be found out.
3. Rauksyam—roughness, hardness or dryness. Stone, copper, iron, gold etc. enjoy different degrees of hardness on account of this property. It is said:

रीक्षाद्वां संप्रहो वेस्वबः च मूतानाम् युक्तिदीपिका।

i.e. on account of roughness or dryness the Āpah molecules or even the water-drops hold themselves together. In many objects the projected parts of the particles fit in with other parts. Distinctness of molecules of different objects is due to this property.

Modern verdict—The distinctness of molecules of different objects is noted in modern physics. Gamow says:

"There are as many different kinds of molecules as there are different substances,..........There are the molecules of oxygen, the molecules of water, alcohol, and glycerine.........."

How this property causes the above difference is a matter for future research.

4. Varanam—encircling, covering or choosing association with other paramāṇus or molecules. This choosing takes place from amongst its own class, or from other classes also, is not made clear. It appears, however, to take place from both sides.

5. Sthairyam—firmness, calmness. The Prithivi paramāṇus bestow firmness on all objects. The great earth also is held firm on this account. The application of Karma or force disturbs the effect of this property, but the moment the application or momentum of that force stops, the objects again attain firmness or come to rest. It is said:

स्थैर्यं स्थिरता चिरकालावस्थापिविचित्तिः उदयन, किरणावली।

1 Gamow and Cleveland, p. 327.
2 Also quoted by B. N. Seal, Positive Sciences, p. 102.
i.e. *Prithvi*—the great earth will remain firm in this very form for a long period.

Another author expresses it in another way:—

तथा स्थवृर्त । पृथिविया प्रशान्तिक्षणमिति । व्योमवती, पूँ २२६ ।

i.e. the un-momentariness of this great earth.

In the *Yoga-sūtras*, this property, or this adjective is explained with an example:—

स्थिथरपद्म । यथा सर्प गोच्छ चेति । ३१२१।।

i.e. a firm foot, as the grasp of a serpent or an iguana.

Duration of the earth—*How long* is the period of duration of the earth can definitely be calculated by a knowledge of the mode, nature and intensity in which the viscosity of its various molecules has taken place.

6. *Sthiti* = *Vritti*—habit of bringing into close contact, *paramāṇus* of different kinds. Combination of different *paramāṇus* is due to this property.

7. *Behda*—disintegration. All earthy objects disintegrate on account of this property.

Nos. 6 and 7 help in the combination and disintegration of molecules of the endless types of matter.

8. *Kshama*—endurance. All blows are borne on its account. The *Artha śāstra* says:—

क्षमायान् पृथिवीसम: । १५७१५१।।

i.e. A man in a high office should be of enduring nature, like the earth.

Rigveda says:—

पृथिवी क्षमा । ३१०५०१६०२।।
i.e. the earth which endures all

Quality of keeping in contact. Mahābhārata, Śāntiparvā, records another truth, which is the result of this property:—

तत्स्मादुत्तिथ्थे विष्र देवाद् विश्वमुबः पते।
क्रमा क्षमावतं श्रेष्ठ यया भूमिस्तु युष्यते || शास्तिपार्वः, ३१४.६।।

i.e. from that mundane egg comes into existence that endurance, by means of which the earth remains in tact.

This quality appears in different grades in different objects.

9. Kārsṇyam—shadow or blackness, opaqueness in objects is due to this property. Glass is transparent, because Āpah and Agniḥ molecules abound in it, and Prithivi molecules are in a lesser quantity.

It should be remembered in this connection that silica, the main constituent of glass abounds in Āpah and Agniḥ molecules.

10. Kāṭhīnyam—solidity. This should be regarded as quite distinct from samghāta or union of molecules. It is different from sthiti (No. 6) as well.

Solidity and temperature. It is a matter of daily experience that all liquids become solids, when under the influence of the decrease of temperature, the molecules of Agniḥ vacate the space and the molecules of the liquids in general, come in closer contact, and the paramāṇus of Prithivi or their molecules behave in a changed way.

Minute differences between Kāṭhīnya=solidity, samghāta =close union, ghanatva=density, gurutva=mass, and bhāra=weight should be carefully settled. Their fine distinction is...
not yet fully clear to me. However, the word density in physics has some relation with them. I, therefore, quote below some of the facts noted by the seers, about the density of the Sun, and also the causes which are responsible for this phenomenon.

Sun's density—Here. I reproduce, one of the latest findings about the density of the sun:

"The Earth's density is some four times as great as the Sun's, since the mean density of the Earth is 5.5 times that of water, that of the sun (taking the density of water as unit) is 1.4. Already we are beginning to glimpse the fact that the Sun can not be in a solid state, for its constituent materials are on the average much less dense, than those solid materials of which the Earth is composed."

And again:

"The Sun's mean density, which is only a quarter of the Earth's, and since the time of Sacchi and Lockyear it has been realised and repeatedly confirmed that the sun is a wholly gaseous globe."

The above Truth known long-long ago—A major part of the above statements is true. It is based on sound reasoning. No doubt a great part of the sun, being a collection of rays, as already said in (2) above, is without gurutva or gravity; and the sun, therefore, is light as compared to the earth. But the picture of the "gaseous globe" requires improvement.

The Sun—A far better description of the sun and the matter it is composed of, is given by the Vedic seers. For example:

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1 Abetti, The Sun, p. 40.
2 ibid, p. 342.
PROPERTIES OF MATTER

(a) अपाह तेन गम्भीरम् कृतवर्जन लोकम् [२ अपाह०. १००२५२१२०]।

i.e. O ye, the wife of the Sun, climb to the region of Apah (most subtle water, which is neither primordial nor the ordinary one).

(b) इमपर्यं सज्जमेव खुर्ष्यस्य । अपाह०. १००१२३।१।

i.e. To this (Vena) in the confluence of the sun and the Apah.

(c) अपाह गम्भीरसिद्ध । यजुः १९२१०।।

This mantra is translated in the Sātapatthāna Brāhmaṇa (3150 B.V.) in the following way:—

“Seat thee in the depth of the Apah, for that indeed is the deepest (place) of the (heavenly) Apah, where yonder (sun) produces heat.”

A better translation is not possible.

(d) अपाह: सूर्यः समाहिता: । तैः ग्राह० १२५।१।।

i.e. Apah are placed in the sun.

(e) ग्राहः रसमुद्रयस्तृ । सूर्यः समाहितम् । ग्राहः रसमुद्र

yog rasa: । यजु: ६ । ३।।

The Sat. Br. V. 1. 2. 7 translates it in the following way:—

i.e. “The essence of Apah, the best of foods [for the gods], being contained in the sun.” “that surely is the essence of Apah, which purifies, and it is contained in the sun.”

(f) ये हू वा एत नान्दिनयस्य रसमय एतानि हु वा एतस्य श्रृंगाविणः । मध्य उ हू वा ए एतद ग्राहः । जमिनि ग्राह०

२ । १४५।।

1: तद्यद्रु प्रयम्यम् प्रमुतम्-न ये देवा प्रभविनि न पितिता । एतदेवामृतं दुह्व्य-वृक्ष्यनि। छाह० उपाह०. १३६।१।।


3 एथ वा ग्राहः रसो योक्ष्यम् पवते। छ एथ सूर्यः समाहित: । सूर्यः पवते।

शा घन० ४ । १ । २ । १७।।
i.e. these, surely, what are the rays of the sun, these are certainly its hoods. It is in the midst of \textit{Apah}.

(\textit{g}) 
\begin{center}
\textit{अविष्क्रियं स्वं कृपते गृहते बुधम्। अध्य १०२ च २७२ २४।}
\end{center}

i.e. (the sun) spreads forth light, it conceals the water. \textit{Busa}.—The essence of \textit{Apah}, referred to in (e) appears to be \textit{busa} which is translated ordinarily as water. These are the \textit{busa} particles, which disintegrate or break into finer particles on the surface of the sun (\textit{sūrya tvak}). This is noted by \textit{Yāska} in \textit{Nirukta} V. 19.

Hydrogen, helium etc. are all the various transformations of the Real Element \textit{Apah}.

(h) 
\begin{center}
\textit{गृहः ब्रह्म पुष्य ११ ३३।}
\end{center}

i.e. the condensed form of \textit{Apah} (cloud ?) is the very \textit{Savitā} (sun).

(i) 
\begin{center}
\textit{ैसूत्रो जातारः तौरो व्यापारमस्त्योज्नयः।}
\textit{तस्मादपि निब्ध दृश्यं तीर्थिदीयायत्त्यसो दिवी।}
\end{center}

\textit{बालिकुराण} ५३ ११।

i.e. the three \textit{Agnis}, electric (of the middle region), digestive (of the intestines in living beings), and of the sun, come out of \textit{Apah} (waters); hence the yonder sun shines in the heavens, after drinking waters by means of its rays.

(j) 
\begin{center}
\textit{भोगान्तरिधिं दिभ्यं च श्राप प्राप्तविन्धनम्।}
\textit{एता गमतिसभि: पीला दीप्यते रावित्सं}।
\end{center}

\textit{मूहृद योगियाजाज्वल्यम्, ६ ४५, ४६।}

i.e. the waters of the earth, of the intermediate region, and divine, are called water-fuel; these being drunk by the rays, shine in the disc of the sun.

(k) 
\begin{center}
\textit{दिख्यम् प्रवेशनम्। सौरीच्छुदादि।}
\textit{प्रशस्तपाठ, पदार्थोंम् सो पुष्य २४६।}
\end{center}
i.e. the light heavenly (ḥ of the sun), is from the Āpah fuel.

**Beautiful disclosure**—These eleven authorities, quoted above, beautifully disclose a truth of the highest importance in relation to the fuel of the sun. All scientists know that hydrogen etc. are the offshoots of water and are a source of fuel for the sun. This basic truth was the common property of the ancient writers of Bhārata. It is now, rediscovered, quite recently by the western scientists.

**Sun’s fuel will never exhaust**—There is a general fear in the minds of many scientists of the present day that, in a distant future, the material of the fuel of the sun, will completely exhaust. In reality, such is not the case. The phenomenon of this fuel is happening in the form of a cycle, and its clear course will be explained in a following chapter.

All this has been said in the context of solidity. It can, here, be safely accepted that solidity is the property of Prithivi molecules, and as the sun is a sum-total of the majority of Agnih and Āpah paramāṇus or molecules, its density is far less than the density of the earth. The sun contains a very small number of Prithivi paramāṇus.

11. **Bhāraḥ**—weight. This should not be confused with gravity. Both are quite separately mentioned in the Mahābhārata text. This property has passed on to the great earth, which along with objects pertaining to it, does possess weight. It is said:

> ग्रह्सु भूमिः शिष्यिरे मूरिभार: | जैमिनि भारष्ट्रकः, १ १० ७ १

i.e. the earth, which is of enormous weight, slept in the waters (during the intermediate dissolution.)

**Axle of the universe, its weight**—The conception of this axle requires a detailed explanation of the mode of rotation of the planets,
But this is not the place for all that. I simply quote here a mantra of the Rigveda, which states about the weight of this axle:

तस्य नाथः तत्त्वे भूरिभारः। क्रृ ० १ । १६४ । १२ ।

i.e. the axle of the universe, does not become hot, though possessed of enormous weight.

The relativity of weight will be discussed elsewhere.

Weightless—Weight is the property of Prithivi and Āpah molecules only, and has nothing to do with Agniḥ and Vāyu molecules. These two R. Elements are weightless. It is worth remembering, that ordinary air, which has weight is not Vāyu proper. It contains in it thousands and thousands of particles of a number of substances: The weight of the ordinary air even is due to those substances.

Weight and gravitational force—The weight of an object "at the north pole, where the pull of gravity is strong," is a little more than its weight "on Pike's Peak, where gravity is relatively weak;" therefore, it should not be supposed that all weight is due to the gravitational force. Weight is inherent in things which have Prithivi and Āpah molecules in them.

Āntarya Law—In the above context of gurutva=gravity and bhāra=weight, the phenomenon of Āntarya should also be noted. It has been explained with examples by Patañjali in his Vyākaraṇa Mahābhāṣya, I. 1.50.

Here comes to an end a brief account of the properties of the Real Element Prithivi.

II. Real Element Āpah and its subsequent transformations

Two forms—Like Prithivi, Āpah also exists in two forms. One form is that which is the original or the Real Element
form, and the other one is that of the ordinary liquid water etc. The original form of the Āpaḥ paramāṇus is that, from which arise the later molecular combinations of helium, hydrogen, oxygen and water etc.

Āpaḥ in their own form—Āpaḥ have their own distinct form. It was clearly noticed by the seers. Their observation is preserved in a half-verse of the Vāyu-purāṇa:

यथा ह्यापस्तु विचिद्घन्ता सवर्णपुष्पमात्सि वै | बायु पुरोऽर, १४ | २५ ॥

i.e. as the Āpaḥ, when broken, split up or disintegrated, attain their own form.

Breaking up of busa—a form of water—A form of the Āpaḥ particles, called busa in the Veda, breaks up, and is concealed by the sun, It is noted by Yāska on Rigveda X. 27.24:

श्वाचिद्घुते भासमु भासित्यः | गृह्वते बुसमु | बुसमु, इत्युदकनाम | ब्रजीते: शब्दकर्मण: | अश्चातेवा | निष्कर्त ५ | १६ ॥

i.e. busa¹ is water; it creates sound; it disintegrates.

Breaking up of bribūka—a form of water—Yāska, the master of Vedic knowledge writes, while explaining Rigveda X. 27.23:

बृबूकम्, इत्युदकनाम | ब्रजीतेवा शब्दकर्मण: | अश्चातेवा | निष्कर्त २ | २२ ॥

i.e. bribūka¹ is water, it creates sound [when it breaks]; it disintegrates.

The above statements will give some idea about the fact that the seers knew the splitting up of water particles, and also the real or better still, the original form of water.

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¹. How the ordinary water, which ascends from the earth, reaches the sun, and is transformed into these forms, is stated in my "Veda-vidya-Nidarsbana,"
II. And now the properties of the Real Element Āpah. The following texts help in this matter:

(क) स्नेहः: सौन्दर्यं प्रभा शोकस्य मार्गसं करवन्त ।
शैल्यं रक्षा पवित्तत्वं सन्तानवन्योद्वकः गुणाः। ॥ ३ ॥

(ख) शैल्यं रक्षा पवितःत्वं सन्तानवन्योद्वकः गुणाः।
वार्षिकः, व्यासं भासं टीकः। ॥

(ग) प्राप्त शैल्यं रक्ष: क्लेवत्र द्रवतः स्नेहसौम्यतः।
जिभाविन्यतेन चापि भौमानं भरणं तथा॥

(घ) प्रसात्मकं रसः रसां शैल्यं मार्गं स्नेहः: क्लेवत| ॥
चरक सं ३, हारिर, ॥ ९ ॥

1. Snehah—oiliness, smoothness, viscosity. Prithyil paramāṇus remain coherent on its account.

The Setu commentary on Padārtha Dharma Śāṅkaraḥ remarks that some writers opine that oiliness is not the property of water. This appears to be a later thought only. The seers do regard it as the property of Āpah, though it appears, when Āpah molecules are in a slightly changed form. The result of this property is the existence of ghrita (=clarified butter in the ordinary language) in the middle and heavenly regions. This is often referred to in the Rigveda and is generally translated as ‘water’ by the translators.

1. (क) सूत्रोदक—हृदृढः, पृ २६२। कार्योदकादि वृत्तीं ढीका, ७. १. ७।
(ख) यथा हि श्रुतियिः परमाःगुच्छवाम निष्ठा। कार्योदकानं हवितं ह
हुदापोपीय। श्रोमवती, पृ २३९-१।
(घ) ग्राह्यं तासु पुर्ववत्व द्विविषयं। नियमित्यमात्रात्।
प्रयास्तपाय, पदार्थ—पृ ३० पृ २३६।

2. स्नेहो न जलवर्मः। पृ २९२।

3. I. ८५.३; ८७.२, A. A. Macdonell’s translation (Vedic Reařer I.85.3.) into “fatness” is quite unsuitable in the Vedic technique.
PROPERTIES OF MATTER

The technical sense of this Vedic word was forgotten for about two thousand years.

2. Sauksmyam—minuteness, fineness. This is the cause of the so-called gaseous state of matter. Molecules of substances in union with the molecules of Āpah; pass into an extremely fine state on account of the heat of the Agniḥ paramāṇus, and exist in Vāyu. They get the name of “gas” in modern chemistry.

Expansion of gases—Āpah molecules attain fineness on account of heat. Āpah have the other property of expansion. Their very name indicates that they expand. It is an every day experience that boiling water occupies more space; Now these Āpah molecules, which carry with them the fine particles of other objects, behave always in a similar way in Vāyu. And, therefore it is said:

“all gases subjected to heating expand in almost exactly the same way.”

This property of fineness has a far-reaching effect. Another truth should also be kept in sight in this connection. It is said:

सोष्माय घनत्रेवेदः | युक्तिदीपिका, प० १४२ |

i.e. the Āpah particles becoming extremely fine [on account of heat] enter into the molecules of different objects.

This state of Āpah causes that state of substances, which is ordinarily called the gaseous state.


It should not be supposed that Agniḥ paramāṇus alone give out light. The light radiating from the sun, the stars, the moon and the galaxies is all due to a conjoint action of Agniḥ and Āpah paramāṇus. This has been indicated

1. Gamow and Cleveland, p. 147.
above in the context of the sun (i,j.)

Modern findings:—Being unaware of these fundamental properties of the five Real Elements, and having no knowledge of their true nature, a modern physicist says:—

“At all events, light remains even now one of the greatest mysteries of nature. Whether or not a key to it is found in future will depend on the extent to which man can perfect his intellectual powers.”

The phenomenon of light rays in due to the above facts. It is a pity that modern scientists have altogether ignored the ancient knowledge. One thing, however, is rightly remarked by Dogigli, “the extent to which man can perfect his intellectual knowledge.” I have only to add in this connection, that either the modern man should become a seer himself by practising yoga, or should take help of the observations of the seers.

4. Šauklyam—brightness, whitish look. Its opposite property is Karṣṇyam=blackness. This is mentioned in article (I.9) above, in the context of the properties of Prithivi. Due to this property, glass and many other substances are either transparent or translucent, and different kinds of rays pass through glass and silica pieces etc. The sun and moon are bright on account of the abundance of Āpah and Agniḥ paramāṇus in them.

5. Mārdavam—delicacy, tenderness or being brittle. Elasticity² in metals is due to this property. It is clearly stated in Yukti-dīpikā that the presence of Āpah molecules in hard substances is the cause of their elasticity.³ Āpah molecules

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2 Gamow and Cleveland, Physics, p.9.
3 कृशितां चातानमस् | दू १४२ |
play a very great role in this respect. I have said under II. 1 above, that oiliness results from Āpah molecules; and this is supported by Patanjali, who writes:

मूर्ति—स्निधि। व्याकरण महाभाष्यम्, १ २ १ २०।।

i.e. elasticity is nothing, but a result of the arrangement of sneha type Āpah molecules.

6. Gauravam—gravity or stability. This property of gravity is somewhat in common with the paramāṇus of Prithivi. Water falls from the clouds on the earth on account of it. It is remarked in Yukti Ḍīpikā that it also helps in the flow of streams.

7. Śaitya—Cold. This is the inherent property of Āpah paramāṇus and molecules. Absolute temperature in modern physics indicates this property. It is irrespective of the feeling of heat and cold experienced by the skin.

Ekārṇava state—When Āpah molecules enjoy this sole property of cold, their state is of ekārṇava. It is said:

शैष्यालु एकार्णवे तस्मिनं वायुनासक्षस्तु संहृता:।

i.e. On account of cold, in that one-sea-like state, the Vāyu atoms made the Āpah atoms compressed.

When it happened—This one-sea-like state existed prior to the birth of the mundane egg. Then on account of the šaitya=cold, the paramāṇus and molecules of Āpah had become extremely lazy. It is said, therefore:

---

1 गृहस्त्वात् पतातम्। बैठो सूर ५१२१।।
2 बशतस्थ्वम्। पूरे १४२।।
3 शैष्यस्थमृच। वायु पुराण २४।१५।१।
4 वायु पुराण ६।१६।१।१०।।
5 व्रह्गाण्ड पुराण—संहृता।।
i.e. during that condition, the Āpah paramāṇus had lost almost all motion. They were not in motion.

Modern findings—"It thus begins to become clear even to the greatest optimist that, while a closer approach to absolute zero may be possible, the likelihood of our reaching it by any finite thermodynamic process is entirely ruled out."

"Complete molecular repose is a condition unknown to nature.—For example, the ability of molecules to form combinations with others falls off perceptibly when their speed is cut down. Even more remarkable—almost canny, in fact—is the behaviour of certain metals and other substances when their temperatures are reduced......Substances in this state are called superconductors."  

Sallila state—This state of Āpah molecules is termed their sallila state:

\[ \text{व्रजत्येकांवलं हि सलिलाश्वास्तवास्त्रिता:} \]

Another reading of this text is also found:

\[ \text{शरमाणा व्रजत्येव सलिलाश्वास्तवास्त्रिता:} \]

\[ \text{क्राणु गुप्ते गुप्ते} \]

i.e. shrunk do they become, and follow the condition of sallila.

Karaka state—In another place it is said that the Āpah in that state are called ambhas, as well as Karkaḥ.

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1 बाधु पुराणां ४५७ ११


3 Sallila = 'Flood', as is generally rendered into English by Christian and Jew scholars is not the correct rendering.
The word *Karaka* ordinarily means snow, but the now lost dictionary of *Śēṣa*, as quoted by the Jain teacher Hemacandra in his *Abhīdhaṇa Cintāmaṇi*, gives the word *bīja-udakam*\(^1\) i.e. ‘the seed water’. The meaning of this word is clear, but the technical significance of this meaning needs to be carefully studied.

8. Rakṣā—protection. This property helps in calming down explosions and many other formidable happenings in nature. Will a day come, when scientists will utilize this hint to discover Anti-Atomic-bombs.

9. Pavitratvam—Purification, and conversion into rays. According to *Nirukta* (3100 B.V.) XII. 32, the *pavitravantah* of Rigveda IX. 73,3 should be translated as:—

\[
\text{पवित्रवन्तः} = \text{रहितवन्तः, माध्यमिका देवगणः।}
\]

i.e. the middle region’s physical powers, which have rays.

These are the result of *Āpah* molecules in the middle region.

According to different *Brāhmaṇa* works *Āpah*, *Agniḥ* and *Vāyu* are pure, and purifying. All these shine in different degrees and give birth to rays. The sun’s rays also belong to this category. It is said:—

\[
(क) \text{पवित्र वास्त्रापः। शौ ब्रा ११२०२१२१।}
\]

\[
(ख) \text{वसो: पवित्रस्म अभिनः सवितुरस्म रहस्यः। मै० उप० ६१६।}
\]

\[
(ग) \text{प्रयं वे पवित्रः योजयं पवते। शौ ब्रा ११२१२२।}
\]

\(^1\) Cf. *मूलोद्वक, बृहती, पू० २६२।*
How they purify the physical world, can also be known. The Radioactive Elements, which if not carefully handled are harmful to the life of man, can be calmed with the use of these substances, if used in their right perspective.

10. Santānam—progeny. The creation of the universe in all its aspects begins with this property of the Āpah paramāṇus.

There is another reading in its place. It is given in the next line.

Sandhānam—union. Āpah molecules unite at once with other Āpah molecules. When rivers and streams flow, the molecules of water in them always flow united. This is noted in the Mahābhārata :

(क) नदीयान्वयो यथा युक्ता यथा सूर्यः मरीचयः।
सन्तनवाना यथा याति.........॥ शास्तिपर्व २१२।५॥

(ख) यशार्चियो जने: पवनस्य बेगा
मरीश्वयो अक्ष्य नदीयु चापः।
गच्छन्ति चायायन्ति च संयताच।॥ शास्तिपर्व २००।१॥

i.e. as the Āpah in the streams, and as the marīci rays in the sun, go in unison, so also........

Union—Water possesses this property of union. This is noted by Nārāyaṇa Kanṭha in his com. on the Mrigendra tantra :

संग्रहोज्ज्वलस्य अम्बसामृ। २१२।२॥ पौ। २५६॥

i.e. union or to seize or embrace one another is the property of water (=Āpah).

III. Properties of the Real Element Agniḥ—ignis and its subsequent transformations.

The study of the following texts is useful in this connection.
Like the two Real Elements Prithivi and Apah, Agnih is also of two kinds, one of the Real Element state, and the other, of the ordinary one.

Energy—The physicists often use the word energy, in one form or another, for the various kinds of the Real Element Agnih. For example, K. Mendelsohn writes:—“tiny atoms of energy.”

This Agnih exists in nature in fortynine different forms. It is clearly stated in many puranas. For example:—

The cause of these various kinds is the different arrangement of molecules of Agnih.

The word energy is used for the actions also resulting from Agnih and Vayu paramanus.

And now its main properties, one by one.

1. Urdhvagam—upward going. The other reading in its place is urdhvabhak, i.e. the occupation of the upper place.

1 अवमधवति, पृ २५६ ।
2 What is Atomic Energy, p. 51, London, 1946,
When the great or the mundane egg (=Mahad anda or Hiranyagarbha) was born, the Agnih paramāṇus and molecules occupied in it, the uppermost place. It was the result of this property. The Prithivī paramāṇus on account of their mass and weight, and after coming into close contact with other paramāṇus occupied the lowermost place. The earth (=bhūḥ) on account of its weight was the first to separate from the egg, and the sun (=Ādityaḥ) being mainly a collection of Agnih and Āpaḥ paramāṇus, was light, and therefore, the last to separate.

Rise of heated fluids—It is an everyday experience that when fluids are heated, ‘the heated fluid rises and cool fluid moves downwards’.¹ The reason is simple. Agnih paramāṇus enter through the flask or the kettle into the fluid, and soon after entering they cause the fluid to rise along with themselves. This is called upward going.

Boiling caused by upward movement—It is said in Yuktīdīpikā that this property is the cause of boiling and the production of light.² How it causes light, is a matter for further investigation.

2. Pāvakam—tāphaḥ=heat, roasting and purification accompanying it.

A mantra in the Kāthaka sanhītā says:—

वेमिरादित्यस्तपति प्रकेतुभि: । काठक संहिता ११९ ॥

i.e. by which special rays, named praketavah, the sun is hot.

Of the one-thousand rays of the sun, the praketavah rays should be differentiated. All rays have their individual special molecular arrangement. A deep study of the different rays will disclose many hidden truths.

¹ F. Oldham. General Physics, p. 241.
² तांबेति पावकप्रकाः प्रसिद्ध: ।
Students of Veda know that pāvaka Agniḥ pervades throughout the middle region of our solar-system.

3. Dagdhri—burning. This property creates various kinds of salts on and in the earth; it sets aside cold and keeps different temperatures in the different strata of the middle region.

Atmospheric temperature—It is written in Yukti-dīpikā:

नमस्ते ग्रहमत्वं साहदिनिष्ठत्वस्य

i.e. the temperature of the atmosphere and of the middle region helps in the movement of sound waves.

This observation about the travel of sound waves, due to temperature, is very brilliant.

Modern finding—"We see that sound must travel faster in warm gas than in cool,"^1^

4. Pācakam—baking. The following statement of Yukti dīpikā in this connection is worthy of note:

पाचकर्तव्य पपिष्यवस्त्राः क्रियायोगता

i.e. on account of this property, the molecules of Prithivi attain the power of motion. How this takes place, in the case of different machines, is to be studied? It is accepted by physics, as written on p. 9, that heat and movement are synonymous. Śākapūrī also says that the very word Agniḥ should be derived from the root form itāt meaning motion.^

Heat causes sparseness in molecular union—Under this property a change occurs in the molecular union of hard objects. While commenting on Vyāsa bhāṣya, Vācaspati writes:

यापािन: पाकस्य——

यापािन: पाकस्य तप्तुतादि: कठिनाययबवानविवे्यस्य

प्रकर्षिताययववामयोपलक्षणस्य विकारस्य कारणम्

319

1 Gamow and Cleveland, Physics, p. 133.
2 Nirukta, VII. 14.
i.e. as Agnih is the cause of the transformation of dense union of molecules into sparse union in different objects.

This law holds good in the case of every hard substance like the metals, when they get heated.

5. Laghu—light as opposed to heavy. The English word light is only a corrupt form of the Sanskrit original laghu. Prithivi and Āpah paramāṇus are heavy, though their weight differs, but Agnih paramāṇus or its molecules are without weight.

Sun—As already remarked, on account of the abundance of Āpah and Agnih molecules, and the scarcity of Prithivi molecules, the sun is extremely light as compared to the earth.

A mistake in physics—The earlier physicists considered matter to possess weight, and when they found heat, light, electricity and magnetism to be void of weight, they conceived the idea of energy, to express their working, and regarded energy as no part of matter.

Slowly and slowly modern science advanced, and the difference between matter and energy was gradually minimised. Then came in Einstein, who expected that day, when 'there will remain no difference between matter and energy.'

Correct view—In reality weight is not of much consideration in relation to matter as a whole. Agnih is as much a part of matter as Prithivi, and yet Agnih has no weight. The gravitation of the earth has no effect on the rays of the sun, which are only a transformation of the Agnih paramāṇus. The distinction between matter and energy should, therefore, be considered as a dream of the earlier physicists.

Karma—energy, force, performance and according to B.N. Seal "motion". However, it is better to confine the use of
the term energy to *Agnih* and the *Vaisēṣika* term *Karma* to force or motion.

6. **Bhāsvaram**—self illuminating, brilliant. It is said in this connection:—

भास्वरवाद विज्ञातावरकाशानम्। युक्तिदीपिका।

i.e. on account of the property of brilliancy, the *Agnih* molecules make visible many other material substances. It appears that the writer thinks that *Agnih* molecules enter into other substances, and thus make visible other objects.

Metallic wires in electric bulbs become brilliant on this account.

Gold, an example—gold is an example of this property. It is said:—

अपतारितमल-युक्त-क्याणाद्यदीनामः ग्रह्यधारेर्वि
भास्वरस्तियोपलबधः। वै० सू०, २११००१। ग्रह्यतंकुको टीकाः।

i.e. a piece of fully pure gold, and an ideal sword, even in pitch darkness, give proof of their self-illuminating power.

**Nature of brilliancy**, two views—As regards the effect of this property, the later teachers are divided into two schools. Their views are as follows:—

(क) तेजसो रूपं भास्वरम् एव इत्याचार्यः। तत्स्यादि:
श्रेणिकपिलस्तियोपलम्भतः।

१० सू०, ग्रह्यतंकुको व्याक्यः, २११००२।

(ख) रूपं भास्वरं शुक्लं च। वै० सू०, चन्द्रानन्द टीकाः, २११००२।

(ग) शुक्लं भास्वरवृचं रूपं प्रकाशानीलम् इति।
व्योमवती, पृ० १४४।

(घ) रूपवृच-शुक्लं भास्वरं च तेजसः, प्राप्तच।
युक्तिदीपिका, पृ० १४४।

(ङ) शुकलभास्वरं रूपं तेजसः इति।
व्याक्यवाः तात्पर्यटीकाः, २११००२।
i.e. the appearance of Agniḥ is brilliant only. Others opine that it is brilliant as well as white.

Agniḥ’s first appearance, white—When Agniḥ first came into existence, it was śveta=śveta varṇah, i.e. of white colour.1

7. Pradhväṃsi—total destroyer, annihilating, perishing. This is explained by Yāska:—

श्र्कः नयति सन्नयमानः। निरङ्कः ॥१२॥

i.e. it makes that substance its own part and parcel, towards which it bends.

Heat Effects of an Atomic bomb—The annihilating effect of Agniḥ is most conspicuous in the fission of an Atomic bomb. It is expressed as follows:—

"At about 0.1 millisecond from the instant of detonation, it is an isothermal sphere of diameter about 30 yards and temperature 300,000 deg. C. which is 50 times the surface temperature of the sun."2

Heat Effect of Astras—‘With the release of Nārāyaṇa Astra, the quarter-regions were illumined and burnt with extreme heat, and the enemy armies were completely burnt and reduced to ashes."3 The Nārāyaṇa Astra, named after its inventor Nārāyaṇa, had the lustre of a hundred suns.4 Under the influence of Mohā—Raudra Astra the surface of the earth rolled and flames were seen.5

Note—There is no right equivalent in the English language for the word Astra used here.

1 सधोपायदा बिच्छूति मातरिस्वयम् गुहे गुहे श्वेतो श्रेयोमूल ॥
2 Nuclear Explosions, p. 55, Delhi, June 1956.
3 हलस्यमस्येषां संध्वपतं । ब्रह्माण्ड पृथ ॥३१३०॥
4 तदहस्तो शतसौर्यमात्र । ब्रह्माण्ड पृथ ॥३१३६॥
5 ब्रह्माण्ड पृथ ॥३१४७॥
Effects of Radio-active dust—Explosion of an Atomic bomb, or the release of an Astra leaves behind some very harmful effects. These appear through Radio-active particles or dust. These are the result of the action of Agnih-paramāṇus. This is under the influence of the aforesaid property of Agnih.

Anti-Atomic bomb—If we can discover a substance or substances which may ward off this thermal effect of Agnih, and secondly, discover devices or elements which absorb or stop the Radio-active action, we can protect ourselves against these harmful effects. Now a day's lead-lined rubber coats etc. are used as protective articles against X-ray dangers. Again, it is said that “a block of lead, is a good absorber of radiations of all kinds.” So we can discover substances which when used in Anti-Atomic bombs may fully counteract the production or spread of enormous heat, and may purify the Radio-active dust etc.

No denial, an anti-atomic bomb, is equally possible.

Help in this direction—A study of the surface of the moon can help us in this direction. The moon, which contains a part of the heart of the earth, absorbs all the rays of the sun except one, and thus sends cooling effects to the earth. The mode, in which the surface of the moon absorbs so many rays of the sun, can be utilized in finding out a substance which may absorb the heat of the Nuclear Explosion, and may also help in the absorption of Radio-active particles.

Radio-active Dust—Tiny particles of dust do not float independently in the atmosphere. They, possibly remain attached to the rays of the sun. The great sage Manu says:—

1. Gamow and Cleveland, p. 418.
2. यद्य: चन्द्रमसि क्रमां नूतिया हृदय वितुम्। मृ नृच ११३।१३॥
3. भ्राम्यायथ्यथाको रशिर्मचन्द्रमश्च प्रति दीप्यते। निक्षत्र २१६॥
The observation of Manu is further clarified:

रजो विलोकयते तियंग्-जालविष्ट-अर्क रौचियाम्।
मृगेण्द्रतस्त, ०१९१९।

i.e. dust particles are seen when the rays of the sun enter through a slanting lattice.

These dust particles remain attached to marici rays entering through a lattice and are only visible on that account:

जालसूर्यंमरीविस्थमेव तद्रजः कयक्त्रियुष् उपलम्भ्यते नात्ययेति।
न्यायवात् तत्पयंटीकाः, २११९।

These dust particles come under the influence of Radio-activity.

Control over these—These dust particles can be used to react against Radio-activity. Help can also be taken from the Nitrogen molecules, which are so abundant in the air. In short the realm of god Varuna, and the properties of the paramāṇus of the three remaining Real Elements all invite us to find out a way to fight against the menace of the Atom bombs etc.

The seers invented Astras, and all Astras have their counter agents. This is as clear as daylight in the annals of the ancient history of Bhārata. The pra-dhvaṁsi effect of Agniḥ can certainly be overcome. A hint of Praśastapāda should be availed of in this direction:

एकदा एकस्य द्रव्यं, एकमेव कर्म वर्तते।

i.e. At one time, in one substance, a single force exists.

cf. the scientific term CAUSALITY, and its definition:

“The conception that a (fully defined) cause can result in only one (predictable) effect.” (What is Atomic Energy; K. Mendelsohn, 1946, p. 173).

8. Ojasvi—energetic. This property converts the para- māṇus of Agniḥ into electric ones, and they further give rise to electric molecules, electrons or charged particles etc.
9. Jyotih¹—tejah² = prakāśanam = dīptih=light—our texts use the first three words, and the last word is met with in Vāyu purāṇa xxix.155. These different words must convey the idea about the different kinds of rays, which cause light. Their exact significance is yet to be understood.

Prabhā and jyotih—One of the properties of Āpah particles is dim-light, (no. II. 3 above). As against it jyotih and tejah are bright light. It is self-evident that there is a degree of difference between these two also. This difference is marked in the following verse:

यो ते च त्वायु वर्षस्याः मयाज्जुरी।
प्रभम समुत्सुक्षिं दर्षये।

dhāvinaḥ १२१,१६,१७।
i.e. jyotih and prabhā signify different things.

Jyotih further divided—Light is further divided into three categories. These are:

रूपं चक्षुविपाकस्य त्रिविधा ज्योतिष्क्यते।

dhānitrīpār २६१२।
i.e. Appearance, form or colour, the eyes, and the result [of their union], is called the threefold jyotih or light.

Three causes of vision—The above truth is expressed in a slightly different way also. It is said:

रूपं चक्षुः प्रकाशाद्ध वर्षाने हेतवस्त्रय।

dhānitrīpār ३२५२।
i.e. form, eye and light are the three causes of vision.

Electricity contains all forms—This is stated in the Talavakāra Āranyaka:

यो विद्युत्तिर स सर्वस्य। सर्वाणि ह्येतस्तिनौ स्याणि।

dhānitrīpār २७। २७। २७। २७।
i.e. that which is in electricity, comprises all forms. In it are all the forms.

¹ प्रवचन ज्योतिः: श। ऋ १५१२२।
² तेजो वायुस्थिति: श। ऋ २१५।
Why is it so—Electricity is the light of Āpah\(^1\), which are the main source of all forms. Hence the seer says; in it are all the forms\(^2\).

How light-rays travel—Talking about the process by which a teacher imparts knowledge to a pupil, the learned Patañjali remarks, the teacher's knowledge does not come to an end:—

(k) कथम् उपाध्यायाधीनेष इति। अपकामति तस्माद्यत्तयनम्। यद्यपकामति कि नात्यतन्त्यापकामति। संततत्तवात्।\(^3\) भ्रमवाज्योतिबवचानानि। संवरिति। 1 4 25।।

(ख) कथं गोमयाद वृद्धिको जायते। गोलोसाविलोमम्भेऽ दूरं जायतं। अपकामति तास्तेः। । यद्यपकामति कि नात्यतन्त्यापकामति। संततत्तवात्।

भ्रमवाययार्य-घृयार्य। प्रातुभवति। 31 41 10।।

(ग) कथं हिमवतो गंध्र। प्रभवती।। अपकामति तास्तमादापः।।

यद्यपकामति कि नात्यतन्त्यापकामति।। संततत्तवात्।।

भ्रमवाययार्य-घृयार्य। प्रातुभवति। 31 41 11।।

The sum total of the purpose of these extremely illuminating passages is that two are the ways by which knowledge is imparted by a teacher to the pupil.

The first is that of a constant flow from the teacher to the pupil; or secondly, knowledge comes out of the teacher just like light rays when they come out of their source. Every time new

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1. विवच्छ द्रव्यार्पणं ज्योतिः। शष्या श्रा ज । 4 । 2 । 46।।
2. श वदेव विषुष्टी विशिष्टमानाय स्वेतं हुर्यं सरमं।
   तलकाक । 1 । 26।।
3. यद्य व विषुष्टी। संस्कारं नीलं हुर्यं सरमं। 7।।
4. सततमू। सत्तमाय। सेविनमू। सेविनमू। हुर्यं। । ब्रह्मचारमू।
   1 । 1 । 27।।
5. Cf. आकर्षणहारामध्यमाय—संततत्तवात्।।
   भ्रमवाययार्य-घृयार्य। प्रातुभवति। 31 41 28।।
rays and new rays appear [and then travel].

Max Planck—Quanta Theory—Max Planck in quite recent years propounded a new theory about light and heat. The following quotation sums it up in a pithy way:

"On the contrary, he (Planck) said, it must be assumed that heat and the energy in light do not flow continuously—i.e. steadily—but "in droplets", for which he coined the expression quanta."

Wonderful similarity. The passages of *Patañjali* and the other one of Dogigli are wonderfully clear, and similar. No comment on them is further required. The sage *Patañjali* (1200 B.V.) received this truth from the ancient seers.

Constant flow of marici rays—According to the seers the sun called *sahasraṃśu*, has a thousand rays. Of these one thousand the marici rays of the sun go in unison or in a constant flow also. This has already been stated on p. 36 with two quotations from the Śánti parva. What is the difference between ordinary light rays flowing in parts, and the marici rays going in unison, is not quite clear to me. Most probably different rays travel in different ways.

10. Rāgah—colour. This property of Agniḥ is enumerated in the Mahābhārata verse only. It is true that all colour is mainly due to Agniḥ molecules, though in its manifestation Āpaḥ molecules also play their part.

Pṛṣṇah—Variegated. This term is often used for the sun in Vedic mantras. The significance of the term is cleared in the Nīruktā:

पृष्णरावित्यो मवति। प्रात्रुत एनं वर्ण इति नैसक्तः। २१४।

1 Tārāchā, Ṛvānadeva Bhādarāśya Ṛṣavyaḥ:।

देवो रूपपुष्पपृष्णं जयितां वेंशबिन्दव:। हृदितं, ३१६२॥

i.e. As the sparks of fire, the rays of the sun, so the grandson of [the Yogi] appears in the form of drops of light.

i.e. Priśnī is the sun. Colour pervades it.

Again a Brāhmaṇa work remarks:—
सर्वाणि हि ब्राह्मण-प्रभिनः। शतो ब्राह्मणं त्रिः। १५। ११२४।।
i.e. verily all different colours is Agnīh.

Light bestows colour-qualities—Light gives rise to the property of appearance in twelve different forms, and colours are a part of them. It is said:—
शुक्लं कृष्णस्तथा रङ्गः पीतो नीलाश्रणस्तथा।
कठिनिशिवकण: इलक्षण: पिल्लिवऽ मुद्राश्रण:।
एवं द्वाराशिवस्तारी व्योतित्वपुष्ण: स्मृत: ॥ शास्तिपर्वं १७२१३।।
i.e. of the twelve forms of the working of light, the first six enumerated here are the following colours:—
White, black, red (crimson), yellow, blew and reddish brown.

These appear to be the original colours. Other colours are a result of their mixtures.

Mixed colours—Agnīh molecules are the main producers of colours, but they adopt innumerable appearances, when the Agnīh molecules come into close contact with the molecules of maruts and Agnīh, and of the earth as well. In this connection, the following verse is important:—
अनियामकतौतोऽवणा वर्णा: कृतितिलस्य च।
प्राकाशसङ्गमाः हृते भिन्नन्ते सत्तत्वदश्यानातू। शास्तिपर्वं १५०। ३२।।
i.e. the colours of Agnīh, maruts (=Vāyu etc.) and water, and of the surface of the earth, are limitless as the atmosphere is; they break down, when they face an element, which is not of their own kind (?).

Truth hidden—The latter half of the verse is not clear to me. I have given a tentative rendering only. Herein is stated the reason of the breaking up of all the colours. The reason should be investigated.
Another truth about colour—Vāyupurāṇa which is full of scientific observations records another interesting fact. It says:

यदृ वर्णा तु मध्येद भूमिस्तांद्रः संजलिन ध्रुवम् । ६६ । ६० ॥

i.e. whatever is the colour of the earth, undoubtedly, the waters in or around it, have the very same colour.

Colours of the earth—The same purāṇa notices the colours of the various parts of the earth also. These are:

कृष्णभौम, पाण्डुभौम, रक्तमृत्तिक, पीतभौम, शर्करातल, शिलामय, सोवर्णः वायु पुराण २० । १३-१४ ॥

i.e. black earth¹, pale earth, red earth, butter or oil coloured and golden coloured earth.

This should be carefully verified.

Black-land is no other than Egypt.² It was called by this very name in earlier times by the Egyptians themselves. Red earth may be the land round about the Red-sea and so on.

Lens Prism and the breaking up of colours—The importance of a Lens prism was noticed long ago. It is written in the Vāyupurāṇa :

मणिविभज्जते वर्णानु विचित्रानु सकटिके यथा ।
बैमल्वादु ग्राहयवसातूः तद्वर्णः स्यादू तदन्जनः । ६६ । ६६ ॥

i.e., as the wonderful colours are broken up by the lens in a prism³, on account of its purity, brightness and transparency, and on account of its receptive nature or its material, and good position, that colour is represented by the very same hue.

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¹ "The Egyptians called their country 'the black land' contrasting the 'Red' desert on either side, and the black alluvial soil of the Nile valley. The Legacy of the Ancient-world. p. 17.

² ढथ्य सामान्यग्राहयः—इति पवनाः ।

³ डाइवाराहलयरूँ कीका, पूँ ६३३ ॥

A lens cut in a quartz.
Aśrayā or position—A Lens prism breaks up the colours, when it enjoys a specific position; otherwise it only holds the very colour, which is in its vicinity\(^1\), or itself appears to be of the same colour.

Lens Prism and prism—There is a great difference between a sphaṭika maṇi and a sphaṭika. These are two different types. Sphaṭika maṇi alone is a lens prism, which breaks up the colours; while sphaṭika is an ordinary prism. It is said about the sphaṭika in Brahmapurāṇa:—

नानाविधानां वर्णाः वर्ण धते सुनिमिलः।
स्फटिको, न च ते तस्मादुपनासते दृष्टं (स्थो ?) नाप्यसी।

i.e., the colours are of various kinds. The hue of every one of these is held by an ordinary prism. All these colours are not born from the prism, nor is the prism born of them.

Sphaṭika is ordinary glass which is found in mines.

The two verbs—Sanskrit writers were very clear about the working of a lens-prism and that of an ordinary prism. They have used two different verbs vibhajate and dhatte to express their behaviour towards rays. Ordinary prism simply assumes the colour of the substance which is in its vicinity.

Suns rays in a Rainbow—The Sāmkhya teacher Vindhyavāsīn (circa the 1st century Vikrama) as quoted by Varāha Mihira says:

सूर्यस्य विविधवर्णः पवनेन विघटितः कराः साध्रेः।
वियतिः धनुः संस्थाना वे हृदयन्ति ततविन्द्रन्तुः।

\(^1\) योगसूत्र माध्व ११४१।

\(क\) यया स्फटिक उपाध्रत्वेऽवत् तस्माद रूपोपरस्त उपाध्रत्य रूपाकारण


\(ल\) इत्यो रत्नथव�ः॥
i.e. the different-colour-rays of the sun, on a cloudy sky, being broken up or arranged by the wind; and assuming the shape of a bow, are seen in the form of a rainbow.

Two coloured rays of the sun—Vindhyavāsin as quoted above, notes that the rays of the sun are of different colours. This I have not come across at other places, but in the Gopatha Brāhmaṇa it is remarked:—

तद्यदैवकार्य रस्मेदा हो वर्णों मधवत्। उ ०, ६ । ९ ॥
i.e. when of every individual ray, there become two colours.

Rays and colour—This observation, that the rays of the sun are of various colours¹, deserves full verification. On it will depend the composition of the rays.

Colours of Rainbow—The colours of the rainbow are noted by Tilak Sūrti (1397 Vikrama) in his commentary on Laghu-stava-rāja in the following words:—

इन्द्रधनुष द्व-हರित-तीत-सित-हरित-मञ्जिष्ठरूप-पत्ववर्णाः: प्रभां कार्तीं द्वपति । हलोक १।
i.e. the five rainbow colours are—red, yellow (butter colour), white, dark and violet².

Rainbow colours vary—Brihaspati, Parāśara, Uṣṇa and other ancient astronomers note various colours of the rainbow, which are witnessed at different occasions. These are, red, violet, dark, colour of the rising sun, blue and yellow³.

¹ Cf. "The gamma rays are heterogeneous, not monochromatic, Nuclear Explosions, Delhi, p. 64, 1958 A.D.

² Manjisthā or violet is often mentioned in Sanskrit texts; Cf. शुक्ल-रक्त-हरित-तीत-हरित-मञ्जिष्ठरूपयो रूपविषय: ।

³ Adbhutasagara, p. 208,
THE STORY OF CREATION

Does it mean that the rays change colours, or perhaps the action on the surface of the sun changes, and gives rise to different rays.\(^1\)

Rainbow lines—Sometimes definite lines are also marked in a rainbow.\(^1\)

White rainbow—A rainbow of a pure white colour has also been seen.\(^1\)

Apparent cause—We must assume, that the cause of all this phenomenon is that the sun does radiate different types of rays; and this difference arises in the sun on account of different Āpah paramāṇus working in the sun, under the influence of different strokes of Vāyu in some form.

Paints and colours—The Viṣṇu dharma-uttara (circa 2900 B. V.) notes five original paints and five colours. These paints are important for portraits etc.\(^2\)

Wondorous is the working of the rāgah property of the paramāṇus and molecules of Agnih.

Forty-nine kinds of Agnih—A brief description of the properties of Agnih ends here. These properties differ with different kinds of Agnis. The different kinds according to the seers are forty-nine. A thorough study of these will be very fruitful. Before ending this description I express my pity over the fact that the English language has no appropriate word for Agnih. The corrupt form in Latin is ignis, but the English has only preserved the verbal form ignite and—ad. igneous etc.

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\(^1\) Adbhutasagar, p 298.

\(^2\) श्लोकं स्थलं पतं श्वेतं पीलो बिलोमं।
क्रमौ नीलवं राजेन्द्र शतरं ज्ञातं स्वतं।
श्वेतो रक्तस्वर्णो पीतो क्रमौ हूरितमेव च।
मूलवर्णां सत्मवियां पतं गाथविवस्मं।
IV. Properties of the Real Element Vāyu and its subsequent transformations.

(क) तिर्यग्गति: पवित्रत्वम् भाकेपो नोदनं बलम्।
रोक्षम् प्रचछायता शैलं वायोधर्म्मः पूवग्विधा:।

दुक्तिदीपिका।

(ख) चलम् प्रचछायता रोक्षम्।

(ग) वायोरनिमस्तिविवादस्त्वां स्वतन्त्रता।
बलं शैलपं च मोक्षं च कर्मं चेष्टात्मकं मथं।

सांपिर्वं २६।१ ६।।

(घ) रोक्षम् लाचवं शैलं गति: प्रमूर्तत्वं च वायोरत्समुण:।
चरकसं० सूत्र, गो २०।।

(ङ) वायुः प्रणामी। व्यासभाष्यम् ३।२४।।

I, now, come to the fourth Real Element. Its treatment is absent in modern physics. Instead, force, energy and motion etc. are supposed by it to be working in Nature.

Here will now be enumerated and explained the basic properties of Vāyu. These are not in common with the properties of other Real Elements.

1. Tiryag-gatiḥ—horizontal movement. According to Yukti dīpikā, it imparts to the eye the power of casting of the glance.¹

2. Pavitratvam—purity, and the power of producing rays. The Taittirīya Brāhmaṇa records:—

पवित्र वै वायुः। ३।२।५।११।।

i. e. pure certainly is Vāyu.

The Nirukta reads:—

पवित्रत्वं रिविस्तर्त:। १२।३२।।

¹ दृष्टिविशेषः पुष्पविशेषः।
i.e. pavitra means the rays.

These can be the rays of the sun, as well as the rays of the Maruts. The existence of the rays is due to Vāyu also, is a matter for further research.

3. Akshepaḥ—attraction, drawing together and throwing up. It is this attraction which keeps molecules of different substances in cohesion. It is called vyūhan in Sanskrit.

4. Noḍanam—repulsion, pushing away. This property of Vāyu worked in the beginning of creation and the earth (=bhūmi) separated from the mundane egg. Due to this very property, the earth and the sun, which were quite near each other in the beginning, separated, and are now at such a long distance. Receding is impossible without it.

Its effects assume different forms, viz. —

प्रथम चरणम्‌स्‌: | प्रश्नेदिखोपपद्मान्मु्‌ | युक्तिदीपिका।

i.e. the expansion of hot water molecules, and the blowing up of Agniḥ or fire.

Repulsion or separation as a result of Vāyu is well depicted in the Satapatha Brāhmaṇa :

परं वै वायोऽयं पवते। एष: वा इदं सर्वं विचिनितं यद्ववः
किंचिं विभिन्नम्। ॥ १ । १ । ४ । २२ ॥

i.e. this is Vāyu, which blows and shines. It is this which separates all that, whichever is separated.

Another writer also very clearly states:

व्यौऽहो विरचन वायोवृत्तिः। नारायणकट्ठ, मूगेश्वत्त्वतीका, पूर २५६।

1. Noḍan is translated as "pressure" by B.N. Seal, P.S.A.H., p. 133, 139. Seal deals with the Vaisheshika form.
the arrangement and viscosity of molecules, and their disunion or separation, is in the nature of Vāyu.

This must be due to the distinct union of molecules of Vāyu itself.

Electric repulsion—How the opposite charges of electricity attract and how similar ones repel, on account of the action of Vāyu, is a subtle problem. Its different phases and behaviours should be traced in ancient works.

Opposite tendencies—Nos. 3 and 4 above, are two opposite properties; how these work at different times in nature may be understood from the following statement:

"According to Bohr and Wheeler, the fission of heavy nuclei resulting from the impact of a neutron is a resolution of a conflict between the opposing tendencies of nuclear (attractive) and coulomb (repulsive) forces acting in the atomic nucleus." 1

The two opposing tendencies in an atomic nucleus at the striking of a neutron, are worth noting.

5. Balam—power, energy. It causes motion in all bodies. It is said:

समीरण सर्वभास्मः। युक्तिदीपिका॥

i.e. setting in motion of all bodies.

The force of Vāyu is described in other words also:

बायुर्ष्टात्मको बली। शास्तिपर्वः ३१७ ॥ १० ॥

i.e. Vāyu, the forceful, is composed of eight times something.

Eight times is an expression which shows eight times as compared with something That unit of force should be settled.

1 Gamow and Cleveland, Physics p. 457,
6. **Rakṣhayam**—dryness. This is witnessed in everyday experience; but how it works in the molecules of *Vāyu*, requires further study. It is said that this property causes solidity in substances:

शोषणत्वात् काठिन्यकरत्वम्। चरकस्म, सू० १२ । ४,  
चक्रमाणि टीका।

i.e. because it dries up, so it is the cause of solidity.

7. **Achāyatā**—transparency, absence of a shadow. An observation in the *Vāyu purāṇa* throws further light on this aspect:

शुचलब्ध्यौ जिमीरायाश्च कुम्भच्छाया च मेदिनी। ३० । ११०।

i.e. *Agni* and *Āpah* have a white shadow, and the earth casts a black shadow.

In the *Yukti dipikā* it is remarked:

प्रकाश्यत्वतद् प्रहोरात्प्रतिद्व।

i.e. on account of *Vāyu* being without a shadow, the phenomenon of day and night results.

How this happens is not yet clear to me.

8. **Śaityam**—cold—This property is in common with the *Āpah* molecules. This is apparent at the Absolute Temperature of—273 C. of the physicists.

*Viṣṇupurāṇa* preserves another truth, related to cold, in the following half verse:

यथा शैल्यं जले वाती बिंधति कणिकाशालम्। वि० अंश, ७। ३१।

and the learned *Śrīdharasvāmin* explains it thus:

जलस्वतं शैल्यं कणिकाद्वारेणागतं यथा वातो बिंधति।

i.e. the cold, which rests in water, and which comes by

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1 यदि यदि वारकाल्येकं वेजं सम्तिभनिष्किन्द्रत्यनम पत्न तथा च्यंगितं व्यवहार  
शोभकतो, ५० ५६, ४५।
means of kṣīla (=molecules or small drops?), as the wind holds it.

The purpose of this statement is not fully clear.

The Mahābhārata text adds some more properties of Vāyu. Of these the following two are important and are, therefore, given below:—

9. Saighryam—velocity or speed, rapidity and swiftness. How this property is converted for the working of engines is well known in mechanics.

10. Mokṣam—release, radiation, turning out.

Vāyupurāṇa states this action in very clear terms:—

ḥuṣaṇa muṣṭimānaṁ tākṣīmāṁ pūranēva tu ॥ ५१ ॥ ७४ ॥

i.e. by means of the rays, which again are released (=radiated) by Dhruva.

Note. The existence and working of Dhruva is not yet known to western science.

Radio-activity—When, why and under what circumstances, the Vāyu molecules, in certain elements, without any stimulation by Agniḥ molecules, emit constantly direct penetrating rays, is a matter for deep research.

11—13. Three other terms, denoting properties of Vāyu, are calan, = oscillation, gatiḥ = motion, and ceṣṭa = effort. These should be considered with velocity (no. 9).

Forms of motion—Rāghava Bhaṭṭa (1510 Vikrama). has preserved the following verse in this connection. It enumerates the forms of motion in a human body.

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1 Of. śrīmoḥuḥ śṛmaḥ ca varṣaḥ ca muṣṭimāno gamas śṛmaḥ ca varṣaḥ ca dhūṃs naśaḥ ।

2 bāryuḥraṣā, ५२ ॥ ६ ॥

Qhāyana etc. are rays according to this purana,
These are:

1. to run, flow, move.
2. to jump.
3. to consume. Daily motion of a planet is also expressed by this term (bhukti).
4. twisting, contraction.
5. stretching, expansion.

These properties of Vāyu appear as different manifestations of motion.

The contraction and expansion of the muscles and the working of the excretory organs depends on Vāyu.

Velocity and its effect—Vāyu does not allow any vacuum to remain. It readily occupies any space. This is beautifully stated by Mahidāsa Aitareya and Maitrāyani:

(a) वायुहीं तरं सवतहरितं बदियं दिवंत | ऐं ब्र्ह्म १ ० । २ ॥
(b) न खलु वे दिवचन वायुया-प्रपन्तितमसिनि |

िैचात । संहित । २ । २ ॥

i.e. (a) Vāyu, certainly, traverses, whatever is this all, atonce.

1 Cf. (a) विशिष्ठात्रामलक्क्ष्य वनयोगवालक्ष्या वा राधः | युक्तिविपुर्का, पृ ३७ ॥
(b) द्विविधा हि किष्या | प्रस्प्न्यडलक्ष्या, परिशिष्ठालक्ष्या च | युक्तिविपुरका, पृ ६० ॥

Here, parispanda appears to be a better reading. According to Seal it is vibratory motion, p. 130.

2 These are ‘Elastic Deformations,’ Gamow and Cleveland, Physics, p. 104.
(b) nothing certainly, whatever is, is not approached by Vāyu.

Gas, a misnomer—Modern physicists conceive matter to exist in three states. One of these states is called the gaseous state. But, in reality, gasous-state is no distinct state. It is a state in which the molecules or the particles of a substance become extremely fine and expand and occupy larger space, and exist in Vāyu.¹

Cause of this mis-conception—The cause of this wrong conception is apparent. As a matter of fact, the Real Element Vāyu is weightless. And according to the modern scientists, matter was that, which possessed weight; hence the Real Element Vāyu had no existence for them. Consequently, they could not at first think of extremely fine particles, existing in Vāyu alone, and hence they started the technique of the gaseous state.

An Empirical-Law-in support of the above—It is a fundamental truth in modern physics that, ‘all gases expand by practically the same amount when heated’. The reason for this has never been stated so far. It is, however, very clear. Vāyu which helps in the expansion of all heated substances, is a common media for the fine particles of all the heated substances, and itself undergoes the same expansion (which is its own property also), at the same temperature. So we say, that ‘all gases expand by practically the same amount, when heated.’ No other explanation is possible, and it supports my view, that a gas has no separate existence, or that the so-called gas-state of matter is a misnomer.

¹ Cf. "Gases consist of a large number of separate tiny particles called molecules," G. D. Tuli etc. p. 153.
² Gamow and Cleveland, Physics, p. 149
Ek-अर्नव state. I have already stated the ekार्नवa state of Āpah molecules at the beginning of creation. This state was enjoyed by them in union with Vāyu molecules at first. Both have a similar property of sāitya or cold. But slowly and slowly Vāyu also separated its contact from Āpah.

14. Karma—force, action, and according to Seal, motion.

The molecules of the four Real Elements are all endowed with their respective forces, and some forces are the result of interactions of these Real Elements, but the chief Real Element which causes or helps action, is Vāyu. Patañjali observes:

कियापि कृत्रिम कर्म | व्याकरण महामाध्यम, १ | ४ | ३२ ।

i.e. even motion is artificial action or Karma.

15. Praṇāmi—that which carries. It is this property which moves small particles often called dust particles in the atmosphere. It is daily experienced in the light of the rays of the sun, which enter into a room through a lattice window. The minute particles of a so-called gas also expand on its account.

16. Pratibandhakātva—check, resistance. Vyomaśṭva (circa the 7th, 8th century Vikrama) writes:

हष्टं हालायसोधिपि वायोहपरि पर्णा०विव्यवस्थापने गुह्वविचारकल्पम् । व्योमवती, पृ० २२६ ।

i.e. a leaf of a tree, falling on the ground, falls slowly on account of the resistance of Vāyu, which counter-acts gravitation.

This is just the view of the modern physicists. Gamow writes:

“The fact that a feather lingers in the air considerably longer than a stone or a coin is due to the resistance of air.”

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1 pp. 32—34.
2 “Work or energy (which is simply the ability to do work.),” Gamow and Cleveland, p. 62.
3 Gamow and Cleveland, p. 33.
V. Properties of the Real Element \( \text{Akāśa} \)

The Real Elements, which exist in the form of \textit{paramāṇus} and later on as molecules, are four only. Their properties have been briefly described above. The fifth Real Element is the all pervading \( \text{Akāśa} \). Its properties, though a few only, are as follows:—

(v) सर्वतोगतिरव्यूहों विषक्रमभूषिते ते नयः।
\( \text{प्राकाशिणिः विज्जे यः: पुरुषविमुरोधिः:। युक्तिदीपिका।} \)

(६) सर्वतोगतिरव्यूहों दविष्टमभूषिते ते नयः। वाचष्पमति।

(ग) प्राकाश्यामः गुणः शब्दो व्यापितं छिद्रताति।
\( \text{वाचष्पमतम् गनालभ्यम् एवंकभयं अविकारिता।} \)

\

And now a brief exposition of the above:—

1. Sarvatogatiḥ— all pervading.

2. Āvyṳ̄haḥ— being all pervading it never assumes the state of cellular or molecular arrangement.

3. Vishkambhath— support. \( \text{Akāśa} \) is the support of the whole universe. The sun, the moon and the planets, and the furthest galaxies are all enjoying the support of the all pervading \( \text{Akāśa} \).

4. śabda— sound. All phases of sound are related to \( \text{Akāśa} \), Vāyu is a helper only in the travel of its waves.

Other properties enumerated in the \( \text{Śaṅtiparva} \) are in further elucidation of these three, and so are not described here.

Here end the properties of the five \textit{Mahābhūtas}. 
CHAPTER III

PARAMANUS OR ANUS UNITE

Democritus—I have so far briefly described the properties of paramāṇus. The knowledge of the existence of paramāṇus passed from Bhārata to Greece, as well as to other countries. The Greek philosopher Democritus (400 B.C.) interpreted this knowledge, and used the Greek word Atom, meaning an indivisible unit, for it.

Modern scientists in their hurry to get the credit of proclaiming the truths of nature, and under the unwise lead of Priestley to discard everything old, declared, “that there are no less than 92 different kinds of atoms.” 1 In reality these were not atoms, but were only simple dravyas (substances) according to the seers.

Knowledge, however, grew, and with the addition of ever-increasing discoveries, the scientists, later on, had to revise their view, and accepted that, “Atoms themselves despite their name are no longer the indivisible units they were once supposed to be.” 2

Atom, now—At present, the atom is, ‘a still smaller and a more fundamental unit.’ 3 This unit is in the form of electrons, protons and neutrons.

A real Atom—Even electrons etc. are not the real atoms. It is well known that all these units have their individual weights which are evident from the pressure which they exert.

1 K. Mendelssohn, What is Atomic Energy, p. 10, 1946 A. D.
2 Ibid, p. 10.
3 Ibid, p. 10.
And weight is always due to the presence of the Real Elements Āpāḥ and Prithivi. The remaining two kinds of paramāṇus, of Agniḥ and Vayū have no weight according to the seers. Therefore, an electron which has, —I charge, must have an Agniḥ paramāṇu in it, and that which has weight, though infinitesimally small, must have either Āpāḥ or Prithiviḥ paramāṇu in it. Hence an electron can never be a paramāṇu of the seers, and, if I mistake not, it can never be an atom of Democritus as well.

Empedocles—This Greek philosopher also wrote about the Real Elements. Reviewing his belief, George Gamow writes:

"In fact none of the four kinds of matter that Empedocles listed as elementary is in reality elementary; air is a mixture of several different gases, water molecules are formed from hydrogen and oxygen atoms, rocks have a very complex composition involving a great many different elements and finally fire atoms do not exist at all."

Gamow’s note on fire—“As we shall see later in this chapter, the idea of fire atoms was partially regenerated in the theory of light quanta.”

Gamow’s conclusion—“When Democritus and Empedocles spoke of atoms they were essentially basing their arguments on vague philosophical ideas.”

I do not think, the well known scientist has much changed his views about the description of the elements by Empedocles or the ancients, during the past thirteen years, beginning from the time when his book was published in the famous pocket series and the time when I am writing these lines.

Expressions similar to those of Gamow are the common

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1 One Two Three—Infinity, A Mentor Book, 1953, p. 119.
2 ibid. p. 120.
property of almost all educated persons, who have any contact with modern scientific ideas.

Greeks followed Bharatiya philosophers—In reality these were not the “vague philosophical ideas” of the two Greek philosophers only, but were the very ideas of the great philosophers of Bharata as well, who preceded the Greek philosophers by thousands of years. The Bharatiya philosophers, again, imbibed these ideas from the ancient seers, who not only saw the paramāṇus, but the earlier forms of matter as well, by means of the divine eye of their Yoga samādhi.

Cause of misconception—Modern science, was till recently, dealing with the effect (Kārya) state of matter only. It had never the idea that matter exists in two states; the fundamental or the causal state and the effect state. Following its line of experiment, it did not come across seed-Agnih or seed-water, for very many years. It was only recently that scientists after Max Planck’s discoveries, reached the idea of “tiny atoms of energy”¹¹ and “light photons.”¹² The idea of Agnīḥ paramāṇus is not, thus partially regenerated, but is making its way with full force.³ The existence of seed-water is expressed by the Sanskrit words, mula-udaka, bija-udaka and Āpah: Its chemistry requires another Max Planck to come to the fore-front. I will, however, humbly request the scientist to go through this book, and especially its pages 9—11; 14; 16 and 47 carefully. He will, possibly, find matter to ponder over this problem. The reader should remember, as he will find at the end of chapter VI, that all ancient Bharatiya thinkers knew that ordinary water is the result of the union of at least two substances, rasa and Āpah. How could they, then, regard this water as an element.

2 Baek, p. 15 of this book.
Similarity of Greek and Bhāratīya terms—“Empedokles called his elements “roots” and Anaxgorig called his “seeds.” (John Burnet, Greek Philosophy, p. 69, 1955). I have already said in note 6, p. 2 that Yājñavalkya and Bhartrihari, use the word dhātu= root for the Real Elements. Again, the lexicographer Śeṣa is quoted on p. 35, who uses the word bīja=seed for a Real Element. This similarity is not due to mere chance.

Aṇu—The word aṇu in comparison to the word paramāṇu shows that it should be regarded as grosser than a paramāṇu. But I have, however, not been able, so far, to notice the terms of difference between the two. Very often the two words are used in one and the same sense; certain texts adopt one word, while the others use the other. Rarely does a text use both the words, and if it does, the difference of the technique is not yet clear to me.

(Cf. Vaiśeṣika sūtra IV.1.6; IV.2.4, Mithila Institute edition.)

Mutual Entry1 of Paramāṇus

After these preliminary remarks, we come now to a stage whence the paramāṇus pass on to the stage of aṇus, which is well nigh the stage of the atoms. It was a great step in the story of creation. A vivid description of this stage is met with in Vedic literature, in the Mahābhārata, in the Purāṇas, and in certain Darśanas or philosophical works.

The paramāṇus were active. Their activity took a new turn. It was in the form of mutual entry. How and under what forces it began, is still a matter for investigation; yet two apparent causes are stated in the texts. These are:

(a) subtilety2 and (b) encircling power.3

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1 परस्मार्थस्मृतिः
2 हीरम्यादि ब्रद्वृत्तिः। युक्तिदीर्घिका, पृ० १४२।
3 परमाणायो व्यावहारस्वरूपत्व दृष्टि। वैदेशिक टीका, पृ० ११४।
This occurrence of mutual entry is most important, for, the universe as it is, is the result of this phenomenon. It immediately gave rise to the appearance of aṣuṣ. It is a well known fact with physicists, that their atom is composed of a nucleus and electrons. The existence of these two units in a single structure is the result of mutual entry.

Support of the Universe—The Law of Mutual Entry is the foundation, the very support of the universe. The Vāyu purāṇa says:—

परस्परानुप्रवेशात् धारयति परस्परम् | र० कौ ||

i.e., Mahān, Ahamkāra, Tan-mātrās, and Mahābhūtas or the paramāṇus of four kinds all exist, because on account of their mutual entry, or encircling power they support one another.

Aṇuṣ—It is stated in the Yuktidipikā:—

एकलक्षणेष्य: तत्मात्रेभ्य: परस्परानुप्रवेशात् एकोतरा विशेषा:

ििििपल इति | द० हूँ १०१ ||

i.e., From the simple and almost similar Tan-mātrās, or from the paramāṇus in them (as explained in the Vyāsa-bhāṣya) on account of their mutual entry, more than one viśeṣas or aṇuṣ come into existence.

More than one—This expression is worthy of note. A paramāṇu is invisible, but an aṇu, it appears, becomes visible, and assumes various forms. I am sure that a deeper study of the texts will disclose the cause of the various forms. The various forms later on exhibit the different number of electrons in the structure of the supposed atom.

Veda more explicit—Veda is still clear about the phenomenon of mutual entry. The following mantras are explicit on this point:—

(a) वैश्वानरो यामु भ्रमिन् मन्त्रिष्टः | ि० ७ | हूँ | ४ ||

i.e., The [Āpah paramāṇus,] in whom entered the Vaiśvānara Agniḥ [paramāṇus].

Note:—The Veda presupposes the existence of paramāṇus,
and relates about their adjustment and union, for, otherwise, the question of entry does not arise, and no translation, understandable, becomes possible.

(b) या ग्रन्तं गर्भं दधिरे विद्वर्प: ता: न ग्राप: संश्वोता भवऽर्तु।
काठकूः हस्सुर्व, देवपाल भाष्य।

i.e., those [Āpah paramāṇus] and molecules of multi forms, which hold Agnih [paramāṇus as embryo (nucleus), and are brilliant; may these be blissful on us.

Note:—The word embryo, further clarifies the existence of paramāṇus in Vedic lore. The Āpah paramāṇus alone can take in the Agnih paramāṇus as embryo.

(c) ग्रन्तं या गर्भं दधिरे विद्वर्पं। तैं लों ६ ।६।१।

i.e., those [Āpah paramāṇus] which hold Agnih paramāṇus as embryo, and are of all forms.

(d) या ग्रन्तं गर्भं दधिरे सुवर्था। ग्रंवेद, १।३३।१-२।

i.e., which [Āpah paramāṇus] hold Agnih [paramāṇus] as nucleus, and are brilliant i.e., of beautiful colour.

Note:—The Āpah paramāṇus are brilliant, because these are charged with some kind of electricity. They have crossed the simple paramāṇu stage.

The four mantras cited above, supply a great clue to Vedic technique. No translation of Veda, will be worth its while, which does not solve these riddles, and presents an intelligent version.

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1 Vol. I. p. 40,
2 Cf. W. D. Whitney's translation:—
"Who, of beauteous color, assumed Agni as embryo—let those waters."

It is apparent that without a good knowledge of Vedic technique, no translation of Veda can be faithful or satisfactory. Sophisticated philology, which is without the background of any genuine history, and is much trumpeted and boasted about, is of little avail,
Akṣapāda repeats the truth—Aṅgir ṣa (＝with the eye towards the foot) Gautama, the father of logic (3300 B. Vikrama) notes this phenomenon in his Nyāyasūtras with further clarity:

विषेष हि ब्रह्मां भरेण । ३ । १ । १६॥

i.e., because the latter [bhūta, of the five Real Elements] is entered by the former [bhūta].

Exception to this rule—Against this general rule, an Agnīḥ paramāṇu seeks union with all other paramāṇus or anus. It appears that an Agnīḥ paramāṇu or even an anus, which has not entered into an Āpaḥ paramāṇu, and has not yet assumed the later forms of an anus or an atom even, has the capacity to come into union with all other paramāṇus or anus. It is said, therefore:

सवेत्या च एष [अभिन्द्] सूतानाम् श्रतिधि:।

शृंगपथनः ६ । ७ । १ । १२ ॥

i.e., this Agnīḥ [paramāṇu] is the guest of all Real elements.

Note:—The word bhūtānām conveys two meanings; the living beings and the Real elements.

Even at the Molecular Stage
Valūshika’s further clarification—The seer Kaṇāda throws

1 aparā＝present; para＝former; Cf. Bhagavadgīta：-

गृं प्रभुं ज्ञाते जन्म परेत्य ज्ञाते विवृति: ॥४॥

The text of Vatsyayana’s commentary on this sutra requires more careful editing. Tatparya tika translates it as:

विषेष＝श्यामरम्

Ganga Nath Jha's Eng. translation is not helpful. Cakrapani, on the other hand, the commentator of Caraka Samhita, is very explicit. He translates it as：-

ख-वाव्य-व्रिंम-वाल-विनीमाः उत्तरायणे दूते पूर्वपूर्वयुतस्य नित्यम-नृपवेश: । सूपस्थानं । १६॥
further light on this entry-phenomenon and cites a common happening as an example:—

\[ \text{श्रयं संधाती विलयत् च तेजसः संपोगात् } ॥ ॥ \]

\[ \text{तत्राहस्त्रूप्तविलिङ्गम् तृ ॥ ॥} \]

\[ \text{वैदिकं ब्रह्म मा ॥ ॥} \]

\[ \text{श्रयं संपोगात् विभागाचं रसनिम्नः } ॥ ॥ \]

i.e., the union and disintegration in \( \text{अपह परमानुस} \) and molecules is due to their union with \( \text{अग्नि} (= \text{तेजस}) \) \( \text{परमानुस} \) molecules [of the middle region.] 9.

Note—What are the forces, which lead to this union in nature, should be carefully found out from the ancient texts. Of course, \( \text{वायु} \) is one such force.

The clap of thunder (accompanied with lightning)\(^2\) is an indication of this phenomenon. 10. (For, if there were no \( \text{तेजस} (= \text{अग्नि}) \) molecules with them, how could there be any lightning).

This sound of the thunder takes place when—a \( \text{परमानु} \) or a molecule of \( \text{तेजस} \) enters into a \( \text{परमानु} \) or a molecule of \( \text{अपह} \), or, even contrary to it, when disintegration of these two takes place.

Modern phraseology—Gamow and Cleveland write:—

"The energy liberation in the explosion of nuclear bombs."\(^3\)

Now the eleventh aphorism above quoted:—

i.e., This is supported by Vedic verses.\(^4\)

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1 \( \text{तत्राहस्त्रूप्तविलिङ्गम्} \) This reading of the same word is also found and is equally correct. The letters \( \text{प} \) and \( \text{व} \) are both correct for this word. This working of the two letters is witnessed in the Sanskrit word \( \text{पत्रिक} \) and its German descendant water.

2 \( \text{विस्फृप्तितिमित्राणे} : \) महाभारत, भीमवर्ग, ६७.१.२ B.O.R.Y. ed.

3 p. 465.

4 These have been quoted above, on pp. 66,67 a-b-o-d.
When Āpaḥ paramāṇus or molecules come into union of are made to disintegrate (by the force of Vāyu), the roar accompanied with lightning takes place.¹

*Union*—This union must be due to attraction, and its process requires further study.

*Lightning, Four colours*—As a help in this direction I may state that this union, of course of different shades, creates lightning of four different colours, as noted by *Patañjali*:

बाताय कपिला विशुद्ध भ्रातपायातीलोहिनी ।
पीता भवति सस्याय दुष्मिकाय सिता भवेत् ॥ महाभाष्य २१३१९३॥

i.e., brown or reddish, intense red, yellow or butter colour and white.

*Five kinds of lightning*—This lightning appears in five different forms, on account of the varying strength gained by this union:

i.e., tārā, dhīṣṇyā, ulkā, vidyut and Aśni; every following type being stronger than the previous one.

*Note*—A translation of these technical terms is not possible.

*Bomb explosion*—Roar accompanied with lightning in the explosion of an Atomic bomb is exactly similar to the phenomenon related by the sage Kaṇāda.

*Sage Tittiri on lightning. The teaching of sage Tittiri in his Taittiriya Brāhmaṇa, is* :

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¹ Violent Vāyu causes the outcome of lightning, by freeing the tejas=Agnih particles. This is called :

प्राणमिश्रितं | चक्रसं, सूत्र, १२१५॥
Note. When ordinary fire is calmed by means of water, it also gives a somewhat t-sound. In the above mentioned state of agniḥ, the Marutas caused the agniḥ nucleus to disintegrate. How the electrically charged Marutas cause the disintegration, should be found out? The middle region Marutas are quite unknown to modern physics.

It should be noticed that disintegration causes thunderbolt. Its full process should be found out by the future scientists.

Bomb-Explosion-sound—The explosive roar of an Atom bomb is the result of a similar action as stated above.

Anu form—The term anu is found used in Valṣeśika

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1 Cf. (a) यस्य तत्तथा ह्रदवमाधित्वन्तु जातवेदः। महतो एद्यस्तमयितव | एतते तदवसस्तमरामिः | तैः वा १०।१२।१६।१७। प्रायो १०।१२।१४। ।
(b) चन्द्रनिं महुत्योद्विभयो सप्तकामः। तं देवा ग्रहमन्वतः। सत्य वादेवं अविष्टानीतिः। तत्स्य महतः स्तनविल्पात ह्रदयमाधित्वन्तु। सा विद्वाषातिरस्तरतुः। कपिष्ठलस् ६।१७। काठकस् ६।१२।।
Note. ज्ञितुः in (a) and स्तनविल्पा in (b) are almost identical. The reason is apparent. स्तनविल्पा is the result of Apah molecules.
sūtra V. 2. 14, and VII. 1, 16, 19, 22. In VII. 1.30 Manas—mind¹ is also understood to be an anū.

Anūs first act—In Vatśeṣika sūtra V. 2. 14, it is said that the first stealthy movement [which took place for the first time in the history of creation] of an anū was due to its inherent force, which remains unseen.² This observation is very interesting.

Anūs of Vāyu—Talking about the cause of ordinary sound, the extremely learned Bhartri Hari says:—

श्रवणः कवित्वितात् भेद-संसारात् हृद्। नाथयपदीयः १। १११।।
i.e., “anūs on account of their possessing all force or power are in the habit of disintegration and combination.”

Modern view about the two tendencies—The present day science of physics states:—

two principles, the tendency of matter to combine and disintegrate under the influence of chemical and physical forces,

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¹ It is unfortunate that people speaking European languages have quite forgotten the real meaning of this word. The Latin form ‘ment’ is nearer to the original Sanskrit.

² अनुगमनसोहचारी कर्म-द्वितीय भवन्तकारिताति।

The commentary explains:—

प्रसुवां चोपयोपर्यायम्
i.e., the creeping act of the anūs. What is this adrishta—unseen
It is explained by the Setu com. There, while explaining the formation of Karaka (=bell), it is said:—

भोमोहमस्मकम्याच्छासतहस्तम् भवन्त्यक्षम् हृद्। पूः २४२।।

Vatsyayana quotes an ancient teacher, who says:—

ब्रह्मस्त मात्र परमावृत्तां गुरुविशेषः कियाहेतुः। १३२।१६।।

Bhartri Hari—This ancient author (3rd cent. Vikrama or earlier) as quoted above, is clear on this point. He, as his context required, did not talk about this tendency or habit of matter in general. He says, it is the habit of anus of Vāyu.

Cause of disintegration—The Vāyupurāṇa is explicit on this point:

विप्रयोगश्च भूतानां गुणेः संस्फुटते। १०१। १५॥

i.e., “the disintegration of the anus of the various elements takes place on account of their properties.”

Development in properties of Mahābhūtas—In comparison with the properties of Tan-mātrās, the Mahābhūtas are inert, formidable and purposeless or coverers of the undesired,¹(शास्त्र, चार, मूढ़)²

Though inert (=neutral?) the anus are of various powers.³

Vishṇupurāṇa says—Though endowed with various powers, but being separate and without union, they could not create their subjects.²

Formidable—The property of being formidable is due to this mutual entry, for, when they disintegrate, the highly explosive nature becomes apparent.

Cause of stable existence—Being formidable, how the anus carry on a stable existence in nature? As already noted Vāyupurāṇa is very explicit about it. Therein it is said:—

परम्परानुप्रेषयात्रू धारयति परस्परम्। वायुः ४। ३०॥

i.e., “on account of their mutual entry, they help one another to be stable.”

¹ युक्ताणां = वर्णाविभागमेवेत्तालू। शुचिशिवालिका, पृ। १४२।
² (a) नानाबीयाः पूर्वनृत्तान्तवत्तैं सहृद्यति विना। विष्णुपुराण, ११२। ४५
      (b) महाभारत, शास्तिपरं, २३५। ६१५-६१६।
³ Also कृंडकुरुपरण ४। ३३।
Cause of negatively and positively charged particles—Modern science has rightly grasped the negatively charged particles called electrons and a positively charged nucleus of an 'atom.' It appears that the nucleus [==garbha] is the anus of Agniḥ, in union with the anus of Prithivi, and the electrons are the particles of Apah charged with the anus of Agniḥ. This suggestion requires full proof.

Round—Paramāṇu is circular; and its subsequent transformation into an anus also, is circular or round. Mahābhārata, Sāntiparva observes:—

अणुवृत्तवान् ॥ १५२ ॥ ३२ ॥

i.e., "which is round like an anus."

1 Spherical. This term is used by Dr. F. W. Thomas, Vaiśeṣikas, Dashapadarthi,
CHAPTER IV

UNION OF TWO, THREE OR FOUR ANUS

From paramāṇus or anus, the next change is towards dvi or two anusks etc. When two anus join, they become dvi-anukas, when three, tri-anukas and so on.

Forces—Two forces are noted, which cause this union. I have mentioned them on p. 9 and 65. These are vega or motion or speed, and Karma or momentum. Besides these, Bhartri Hari names the two habits of disintegration and combination in the all powerful anus.¹

Importance of Speed—In the process of combination the part played by speed is considerable. This speed is connected with the presence of Agniḥ paramāṇus. This is very clearly noticed by the modern physicists. Johannes Dogigli writes:—

“Complete molecular repose is a condition unknown to nature......the ability of molecules to form combinations with others falls off perceptibly when their speed is cut down......almost uncanny, in fact—is the behaviour of certain metals and other substances when their temperatures are reduced still further.” (p. 48)

Agniḥ the guest—Therefore well it was said by Mahidāsa Aaitareya that Agniḥ is the guest of all elements. Wherever the Agniḥ paramāṇus are less in number, or the temperature is reduced to the furthest end, the heat conductivity increases. It is beautifully expressed by Dogigli again:—

“At 2 degrees above absolute zero, liquid Helium suddenly shows a sharp increase in its capacity to conduct heat. Pracți-

¹ Above p. 72.
cally from one moment to the next, its heat-conductivity jumps a million times." (p. 48)

Therefore the seers again and again praised the doings of Agniḥ.

Adrishta—Vaiśeśika sūtra mentions the force of Adriṣṭa. The ordinary meaning of this word is unknown or unnoticed, but some ancient writers explained it in another way. Their view is preserved by Kaṇḍaliya or Vātsyāyana in the following words:—

श्रव्द्य परमाणवृत्त द्रव्यद्रव्यविभ्य: स्मृत्यादः: 
परमाणव: सममुच्छित्ता: शरीरसुवादाधितीति |

i.e., Adriṣṭa is the name of a particular property of the paramāṇus, which causes motion or vibration. Under its influence, the paramāṇus unite or augment with loud sounds and become more powerful, and create a body.

Vrishabhadeva—The following sentence of the commentator of Vākyapadīya of Bhartṛ Hari, should also be studied:—

यतस्य चतुर्विशा: परमाणवो श्रवणो श्रव्यो ज्ञानो द्रव्यातिकरित्रमेण शरीरविन्युष्णोपतिव्याविधिकार्यसामस्याते |

i.e., because, at the time of creation, the four kinds of paramāṇus, being propelled by an imperceptible (adriṣṭa) property or force, come into union of two, three or four aṇuṣ in succession, and begin the process of forming bodies, senses etc. It is remarked in another place also—

तत: परमाणवो तत्स्थरण संयोगादृ तद्युकान्यूत्पत्ति |

i.e., then on account of the mutual union of the paramāṇus two-aṇuṣkas etc. come into existence.

Seal notes another passage in this connection. He says:—

"Jayanta in his Nyāyamaṇjari notes that Adriṣṭa is resorted to in explanation of observed phenomena only when these
cannot be derived in any way from the operation of known causes." (p. 134)

Substances become visible—The paramāṇus are imperceptible, but the objects around us are perceptible. This state of being visible, or the adoption of rūpa or form, results after the combination of anus in series of two, three or four. It is remarked in Daśapadārthī also:

श्रुन्तं द्रव्यमकर्षवतसम्बवा विकारः परमाणुलयसहतस्वरूपस्य

| द्रव्यस्याणवं-प्रतीतिहेतुव। | 1 |

i.e., After the union of anus, the substance formed by these becomes the subject of perception.

The Atom of modern Physics—The stage of the Atom discovered by the modern scientists appears to have come into existence after the union of two, three or four anus
dakas.

The Universe - a sum total of Atoms—The seer Vyāsa has stated a great truth in the Mahābhārata. He writes:

(क) प्रगनिषोमायिदं सर्वमु दृष्टि। भार्तप्रम। २६।१३॥

i.e., All this universe is a combination of Agniḥ and Soma.

(ख) प्रगनिषोमययं तत्समाज अगन्ध्रस्तं चराचरमु।

| शान्तिपरं ३५।१२॥ |

Daśapadārthī exists in a Chinese translation only. It was translated into English by Dr. F. W. Thomas. The Sanskrit rendering of the English tr. is by Dr. Karunesh Shukla in the Journal of Ganga Nath Jha Research Institute, Vol. XIX, parts 1-4 Nov, 1962—1963, p. 150.

Of द्रव्य वा इदं न तृतीयमरित | भागेऽ “अन्य युक्तिः” च। नयन्त्रकं

| तदावितमु। बबादं तत्समाषमु। श्रो त्राणं १६।१३॥१॥

i.e., Twofold, verily is this, there is no third; the moist and dry. what is dry, that is of Agniḥ, what is moist, that is of Soma.

Also Cf. “a fact which dominated all subsequent physical theory among the Greeks, namely that the world presents us with a series of opposites, of which the most primary are hot and cold wet and dry. (John Burnet, Greek philosophy," p. 22)
i.e., therefore, the whole universe movable and immovable comprises *Agnih* and *Soma*.

(ग) ब्रह्मिकोमात्रमस्क जगत्। हृदिबंश। ॥१४०१॥
(घ) तत्रापि प्रथमो भागः स सोमः राशिक्षृण्येत्।
   हृदिबंश। ॥१४०२॥

i.e., the first division of the *Āpha* molecules is the multitude of *Soma* molecules.

*Soma*—*Soma* is the essence of *Āpha*. Its particles pervade the whole universe. In what way they pervade, is a matter for future study. The composition and nature of *Soma* can be determined with the help of Vedic works.

This observation is based on the great truth of the existence of atoms and molecules.

Atoms of *Agnih*, or I may call them electrons, along with the *Soma* atoms, are the support of this universe. Right, therefore is the proclamation of *Vyāsa*.

**Molecule**

Innumerable two-*anukas* or three-*anukas* united, or in the present language, the atoms united and produced molecules. These later on created substances.

*Avayava*—The correct rendering of this word into English, in this context, is ‘molecule’. Although Monier Williams does not include this meaning, under the heading *avayava*, in his Sanskrit English Dictionary, yet my translation will be more than justified from the following passages, taken from different works. Here, the word *avayava* is used in exactly the sense, in which I have pointed it out.

(a) सम्भवः कोसित भूतानि स्वारप्यवयवृक्षः।
    महत, शास्तिपर्व, १२५।१२४॥
(b) अष्टोस्यब्ययवस्यान्तः यथा दहति पावकः।
    सूतसंहिता, पृ० १०१॥
(c) करक्षय काठिन्यं न गुणास्ततम्। भविष्य तु अष्टोत्तरानाम्—
    अष्टोत्तरसंध्योः। शास्तिकनाथ, मीमांसापठिच्छक, पृ० २१०॥
(d) सलिलं...विरलाब्यन्य समुद्रकक्षुकं भवति।
विष्णुपराण, श्रीधरी टीका, २१५१.६१।
(e) ब्रह्मस्वितं प्रत्ययात्तरवशात्। अर्यच्छायच्छोपव्यत्तं इति।
अर्यवर्मेदाधि। युक्तिदीपिका, पृ० १०६,१०१।
(f) नृत्तेदाधि नृतेभ्य इति सर्गः प्रवत्तते।
विस्तरावयवस्तेष्यं यथाप्रशं यथाश्रुतम्॥
वायुप०, १०३१.३१।
(g) संहता:—निविद्वञ्जयवा: || पदार्थवेशसंप्रहः:।
सेतुटीका, पृ० २५४।

In the first five passages are stated respectively the molecules of bhūtas, of iron, of snow, of water and of different substances. It is further clear in (c) that snow is, with closely united molecules, and in (d) boiling water is, with sparsely united molecules and (g) indicates densely joined molecules, or molecules with a little space.

Why the name avayava—The beauty of Sanskrit language is admitted in all its aspects. So, in this case also, the very name clarifies the underlying idea of this term. “Avayavas or molecules are so-named, as everyone of them is found as a separate entity.”

The separate existence of molecules was fully noticed by the seers.

Different Types of Union

Samyogah—Union. The universe, or all that is subject matter of the senses, is a result of the combination of molecules. Caraka (3000 B. Vikrama), the author of Caraka samhitā writes:

1 निबिद्वञ्जयव, चरक सं० शा० ४१५१।
2 अर्ययुयमत्त इति-भवयवा:। पृ० ९४४,२९। युक्तिदीपिका, कारिका
१०, पृ० ६६।
THE STORY OF CREATION

(a) लोकस्तिष्ठति संयोगात्त्र सर्वं प्रतिष्ठितम् । सूत्र, १४९।।
(b) संयोगाद् वलते सर्वं तमले नानित किष्कनन । शारीर, १५७।।

i.e., "on account of the union of molecules, this whole universe exists, without it there is nothing."

In other words, we may say, that because the molecules are held together, therefore the substances of the universe exist.

Degrees of union—Not only was the separate existence of the molecules clearly noticed by the seers, their union and the varying degrees of that union were also noticed. Some of them are given below:

(a) Suślishṭa—close union. In some substances the molecules are viscous.² Agniḥ molecules are viscous.³

(b) Nibidāvayavaḥ—with molecules very close to each other. The difference between (a) and (b) is not yet known to me.³

(c) Pracayāḥ—loose union. This term is used, when we are to express that the union of molecules is very sparse.⁴ This is termed samsthāna in Nyāya sūtras.⁵

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1. Cf. सौध्यकारिका, २०,२१।
2. शास्त्रिवचः १२५.६७-१००। संस्कृत and प्रशिल्प terms are also used there. ससोऽत्मकः: । एकीमूलः: । व्याकरण महामाध्यमः।
3. Cf. संहृता:—निबिधावयवा: । पदार्थचर्मसंस्कृत, सेतुटिका, पृ. २८२। निविधसंयोगस्वापि सहवाहव्यवस्थायम् । चरकसं: कार्यः ४।१।४।।
चक्रार्दि टिका ।
प्रचयः, वैज्ञानिकसूत्र, ४।१।६।। प्रशिल्प: संयोगः प्रचयः । चन्द्रामन्द्र टिका । समस्तिकें टिका, पृ. ६०३।।
४।१।२।। वलतु संस्थाणं सौध्यव्यवस्थानविवेकः । संस्थाणं नाम प्रचयाव्यः संयोगः: । ४।१।२४।।
शाल्यार्द्वीका, पृ. ४५७।। संस्थाणं हि—प्रवयव-समवेश उच्चते । तद्तुबिनम् टिका, पृ. १०७।।
(d) Sangāḥ—contact only, simple touch. Vijñāna Bhikṣu, the commentator of Sāmkhya sūtras, uses this term.1

(e) Samyāt—This term is used in the Nirukta of Yāska to express the phenomenon of light:

अङ्क्षेत्रीवाय: संयतेत। इति ह्रमू आद्वाति। स्रवतोभुध्यवर्तमान: प्रवाहविविवित। इति स्वाच्छिष:। ततोभिन्नो संस्तु: हर्त्वा—
एवमवशयत्। ७१२३॥

i.e., the rays of the sun and the arcis—the lustre carrying particles of the terrestrial Agnih—unite with one another. This kind of union is expressed by the term samyāt.

In later Sanskrit the terms denoting the fine differences of these unions have disappeared.

Human body—the result of this combination—The teacher Caraka has expressed this result in an extremely brilliant manner. He writes:—

शारीरावस्तु परमाणुमेवदेव—प्रापरिसंकृतव्या भवति। अति बहुतवातु। अति स्वरूपातु। अतिचिन्त्रव्याच। तेषां संयोगविभागे
परमाणुनां कारण वायु: कर्म स्वभाववश। शारीर ७११३॥

i.e., The molecules of the body, on account of the difference of the paramāṇus, are countless, because these are over too many; are extremely minute; and are beyond the senses. Their union and disintegration is caused by Vāyu, by Karma or force, and by svabhava or the inherent nature of the paramāṇus.

This clearly sets forth the deep insight of the teacher.

Molecular Arrangement

Vynhāna—Molecular arrangement.2 This arrangement

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1 संज्ञाव्य: य: संयोग:। quoted by B. N. Seal, Pos. Sc. of the An.
2 स्वत्वस्त्र-भ्रव्यवानाम्। Hindu, p. 49.
3 संगत द्वृतं संगत तैत्तिक:। एकीभूतम्। व्याकरण।
and viscosity bestow shape on substances. This is explained as:

\[ \text{यूहः तु भववरचनाविशेषः। योपवती, पूरः } 244,246 \]
\[ \text{सवेशरीरावतयूहःकरः।} \text{ चरकसौं, सूतः, } 121=11 \]

This arrangement became the cause of the growth of all plant life on this planet of ours:

\[ \text{तत् सिततः जलेमृभि:—स्नत्तद्दमविपाचिता।} \]
\[ \text{वामुना यूहमाना तु बीजलं प्रतिपत्ते। राष्ट्रीय शारदा ति।} \]
\[ \text{टीका, } 1 \text{ } 27 \text{।।} \]

i.e., The earth, being sprinkled with waters and baked by its own internal heat and given a molecular arrangement by Vāyu, assumes the form of a seed.

Vikāra—Change, alteration, transformation. This state is due to the change in arrangement of the molecules. Vātsyāyana Kautilya says:

\[ \text{पूर्वो यूहो निवतते। यूहान्तरं चोपजायते। तं विकारामाप्तते।} \]
\[ \text{वास्यायनभाष्य } 21246।। \]

i.e., The previous arrangement of molecules ends, another arrangement comes into existence. The learned call it change.

Vyavasthita anavasthita avayava—Molecules set right or adjusted and molecules in a disturbed or unadjusted state. These two terms, used in Vākyā paddhyā\(^2\) describe the final stage of arrangement, and the intermediary unsettled one.

It is plain that in every substance the molecules are set right, but external forces can disturb this setting, and consequently change the substance.

Species—Members of a particular species have a definite arrangement of molecules. This is noted by Vātsyāyana:

\[ \text{नियताययःयूहः सल्ल सत्तायव्यव जातिलिङ्गः। } 21265।। \]

\[ \text{१ यूहःकरः—सचातकरः—रचनाकरः। इति यावतः } \]

\[ \text{जचयायिः: टीका।} \]

\[ \text{२ Lahore edition of Pt. Charu Dev, p. 30,} \]
i.e., definitely set molecules in an arranged form give shape to an object and represent a species or a substance.

Modern verdict—"All molecules of a given pure substance are identical....... There are the molecules of oxygen, and of mustard gas, the molecules of water, alcohol, and glycerine...."\(^1\)

Molecules change behaviour—A follower of the Nyāya system says:—

वेगवद हर्ष्योगाड़ ग्रावयवेषु करण्युत्पादते \(^2\)

i.e., contact with speeding objects produces force and action in molecules.

Avayava-antaryojana-dravya—intermolecular substance and force. This force is not clearly described in modern physics; it is only assumed, and the term used for it is merely hypothetical. Western scientists call it a force. It is due to the fact that they do not know, how the molecules remain adhered and form a mass. The seers, however, give the exact substance which binds the molecules together. I have so far found one primary and two secondary causes which lead to the holding together of molecules.

Causes of the union of molecules in substances

I. The first or the primary one is, prāṇa—

(a) प्राणो वे वजुः। प्राणे ह्रीमानि सर्वांगि भूतानि मुख्यते।

शतपर्व व्रचो १६१।१६२॥

(b) सर्वसौरवाचायुष्मकरः [ वायु: ] चरकसं०, सूत्र १२५॥१॥

(c) तेषां संयोजनिविवेगे परमात्मीको कारण वायुः कर्म स्वभावाच।

चरकसं०, शारीर ७१३॥

i.e., (a) “prāṇa is the binding force; in prāṇa do all these elements remain united.”

\(^1\) Gamow and Cleveland, Physics, p. 327,
\(^2\) स्त्रेलिकूर्तिका, पृ ५५।
(b) "Vāyu is the arranger of the molecules of all elements in the body."

c) "Vāyu is the cause of the combination and disintegration of the paramāṇus, and again the force which works in the paramāṇus, and thirdly the inherent nature of the paramāṇus themselves.

Note—We should carefully notice the subtle difference between prāṇa and Vāyu. Viṣṇuva Bhikṣu in his commentary on the Sāṅkhya sūtras draws attention towards this minute difference, and in support thereof refers to the following authority of the Muṇḍaka Upaniṣad:—

एतस्माज्जायते प्राणो मनः सभेदन्द्रियाणि च।
शं वायुज्ञातिरापः पृथ्वी विशेषाय धारिणी ॥२११॥

The next passage I reproduce as quoted in my own Veda-vidyā-nidarśana.¹

प्राणेन वायुनिर्दैर्म्यर्च। भृगुना वायुः। वायुना-व्याक्तियः।
शः १०१६ २११॥

i.e., "by prāṇa certainly Agnih is kindled, by Agnih Vāyu, by Vāyu, the sun.

It should be kept in view that as noted on p. 54, no. 3 a property of Vāyu is attraction. It is due to this property that molecules of substances remain joined intact.

II. The second and a secondary cause is rasa—

This cause works along with Vāyu as intermolecular force in the Āpas, which attain the property of ‘flowing’, due to its combination with them—

तस्मात्वैतत्तिष्ठते देवातूर्वं मूर्तिहिताद्व रसः।
प्राणो हि तेन युक्तते इववचा प्राप्तुवस्ति च ॥ शान्तिपर्व ॥

¹ Quoted on p. 136.
i.e., "from that mundane egg rises rasa, for the welfare of all creatures. Āpas join with that (rasa), and attain the property of a liquid."

III. The second sub-cause is sneha—It is on account of this oily matter, which comes from the atmosphere along with water, that the cohesion of earthy substances and of the earth itself takes place. It is not oil, but something which produces all oily substances.

The following two verses from the Mahābhārata throw a flood of light on this point—

अभिन: पवनसंयुक्त: खातु समृद्धिपते जलम्।
सोक्सिनासहसर्योगातु घनत्वमुपपदते।।14।।
तथ्याकाशात्तिनिपततः स्नेहसु तिष्ठति योपरः।।
स संवातल्लभापन्नो भूमिक्षणयुग्मिति।।16।। शान्तिपर्व, १५१।।

i.e., "Agniḥ combined with wind, makes the waters to fall from the middle region. That with the union of Agniḥ and wind assumes solidity. Of this water, falling from the higher region, that other oily matter which goes into close union or solidification, assumes the form of earth."

Sneha or oily matter, the property of Āpah paramāṇus, is already noted on p. 30, no. 1. The substance sneha is termed as gṛhita in many Vedic verses, and is commonly understood as 'water', but in its exact technical parlance, it is as I have explained above. Sneha and taila are two distinct things.

Annihilation of the earth—When, on account of extreme heat the earth becomes void of this substance, it disintegrates into molecules and passes into total annihilation. This happens when the dissolution period begins.

These three causes have so far come to my knowledge on

1 Cf. स्नेहापर्य वित्तेयगुण:। प्रसृस्त्राद, पदार्थवस्ममस्त्राद, पृ० २६६।।
2 वामशुराणा १००१४५।।
the making of *intermolecular force*. A detailed analysis of these is possible, but requires further research.

Arrangement of atoms and molecules—The *vyāhan* or arrangement of molecules is countless in nature and the difference in substances is due to this. It is said in the *Vyāsa bhāṣya*:

ऋभाष्यवाच परिणामायति हेतुः । योगसूत्रः ३१ १२.१.

i.e., “Difference in the order of molecules is a reason for the innumerable forms which result from it.”

Limitless seeds of plants come into existence, on account of the force of *Vāyu*, which acted in the beginning of creation on the surface region of the earth.

The simple enunciation of the seer *Patañjali* conveys a very deep truth, which is the back bone of atomic studies.

With this preliminary knowledge of matter and its forms, as well as of the properties of matter, I now come to the story proper of creation and dissolution.
Chapter V

CREATION AND DISSOLUTION CYCLES

Change after change—In the previous chapters the reader must have got a glimpse of the idea that the present universe with all its planets, stars and galaxies is the result of a gradual and systematic creation. From the Tan-mātrās, the stage of atoms is reached slowly and slowly. We will further see in the following chapters that the earth itself has undergone many changes, one after another. It was at first-bald, and gave rise to vegetation later on. Many other factors of change will also come to light and the process of gradual change will be clearly understood.

Veda-mantra advocates Gradual change—This factor is clearly disclosed in the following Veda-mantra of the hymn, which records one aspect of the story of creation (= bhāva-vrittam):

अंतर च सत्यं चाभीद्रासुतयसो द्वयज्ञायत। ततो रात्रिरज्ञायत।
तत: समुद्रोर्जज्ञवः || क्रष्णव १० । १६० । २ ॥

i.e., Eternal Law and Satya were born from the lustrous Almighty [in the previous universe.] After that was born the Night [of dissolution.] After that the arṇava ocean [came into existence.]²

Not the First Creation—After comprising the various aspects of this gradual change, a question arises, which ought to be answered here. It is, whether the present universe is the only or the first creation, in the course of a limitless time, or is it something otherwise? The Vedic seers are quite clear on this point and do not regard it as the first creation only.

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1 समुद्रोर्जज्ञवः: || मनु. १ । २७ ॥

2 Subtle exposition of this mantra is found in Jaim. Br. III, 360,
A Cycle—The seers say that prior to the existence of the present universe, there was a period of dissolution. During that state the material of the universe existed in an extremely subtle form, incomprehensible to the senses. In reality the senses themselves were a later creation. And before that state, there was a previous universe, which gradually passed into annihilation. The gradual steps of change which are covered during creation, are retraced one by one during annihilation. Thus there is an unending chain of dissipations and creations. This cycle of dissipations and creations is going on from eternity.

This Truth seen in Vedic verses—The above fact was duly observed by the seers. The seer Aghamarṣaṇa, son of Madhucchandas, observes the 'account of coming into existence' (bhāva-vṛittam) of the universe thus:—

Western translators—Before giving my own translation of this mantra, it is necessary to reproduce the translations of some Christian professors, whose scholarship is trumpeted again and again. I give these in a chronological order:—

(a) J. Muir: "Dhātri (or the Disposer) made the sun and moon as before."

(b) R. T. H. Griffith: "Dhātar, the great creator, then formed in due order Sun and Moon."

(c) K. F. Geldner: 'The creator regularised the turn for Sun and Moon.'

Inefficiency of Griffith and Geldner—Griffith translates the compound, yathā-pūrvar, into, "in due order," and Geldner into, 'regularised the turn'. Both these translations are not only poor, but clumsy also. Muir is somewhat better; but the correct and simple rendering of the text is:—

"The creator created the sun and moon as before."

The Compound, Yathā-pūrvaṃ—In order to justify this translation, I quote a half verse from the Rāmāyana of Vālmiki, where also the compound under discussion occurs:—

इत्यमासितः तथोपवृं यष्ठापूवम् बलीप्रद्रोः ।
युधकाण्डः १२ । ३५ ॥
i.e., "this, their fight, was, as was before [the fight] of Ball and Indra".

It should, thus, be understood that no other translation of the compound is possible. Muir was correct here.

Truths in the text—Let us now grasp some immortal truths which are revealed in the Vedic statement. It is said, firstly, that the creator created the sun and moon. The creation is not the result of the working of matter alone. Secondly, that the creation was not the first one. It was a repetition of the previous universe. Besides these two, there are two more results which come out of these statements. These four, therefore, are as follows:—

I. Dhātā or the creator.

II. The present creation is just the same as was the former creation.

III. Indestructible Matter—The Rigvedic statement "as before" implies that the very matter of which the universe is composed of now is not new. It exists now and it existed before. Hence it is clear that the matter undergoes changes only, and is never destroyed. It always undergoes similar changes or transformations in a regular order during creation, and retards these steps during dissolution.

IV. Physical laws, eternal—The changes which always follow one after another, are in due order, and are thus govern-

1 Compare the note of J. Muir on the above verse. "It is remarkable that here Dhatri is said to have formed the sun, moon, sky—as before; as if, agreeably to the Puranic conception, they had previously existed and been destroyed." Vol. V, p. 31.
ed by definite laws. The universe being the same, the laws are also the same.

These four principles, are further confirmed by the following Veda-mantras:

2. मनुष्यवर्ते प्रज्ञिरसवद्र प्रज्ञिरो यताति दशे पूर्वकृच्छ छूँवे।
कृ त्रो १ १ ११ १७ ॥

i.e., Of the fortynine forms of Agnih, along with their three original ones, the four, i.e., Manu, Angirah, Yayati and Suci are mentioned in this verse of the Agnih hymn. It is a prayer to Suci Agnih, to work as it worked before.

1. वैद्भानः प्रतन्या नाकन्म अश्वदु विवस्पूष्ठ सन्द्वमन: सुमन्त्मवंः।
स पूर्वकृच्छा जनयन्ति जेल्तव्ये गर्न समानमज्ञमं पर्यंति वागृविः॥
कृ त्रो १ २ १ ॥

i.e., Vaisvanara Agnih as in olden times ascended to the region called Nakaca, which is at the back of the heavenly region, being praised by the [heavenly] singers, he, as before, while creating riches for the creatures, pervades the common path of the intermediary region, quite awake.

Note—'as in olden times' repeats the same idea of 'as it was before'. Vaisvanara Agnih and its working is mentioned in many saktas (hymns) of the Rigveda.

4. स्त्राय पञ्चा प्रानुषित्वं: पुराणो यती देवा उदजायत विस्वेः।
कृ त्रो ४ १ ११ ॥

(a) J. Muir: “This has been traversed as the ancient path, through which all the gods were born.”

(b) R.T.H. Griffith: “This is the ancient and accepted path way by which all Gods have come into existence.”

1 Vayupurana 29, 1, 6. Vishnupurana I, 19, 16.
2 In Vedic technique, the heavenly singers are the atoms and the rays coming out of the sun, and creating various vibrations.
These translations are also wide of the mark. A simple and correct translation is given below:

i.e., This path, subsequently realized, is the old one, from which were born upwards, all the gods.

This mantra is in the context of Indra. It gives a clear idea that the creation of gods also, mentioned in the Vedas, is not the first creation only. It is, on the other hand, on the principle of the old path or under the eternal physical laws.

Gods—gods are nothing but the various physical powers, the result of the arrangements of different paramāṇus, and controlling the whole universe. Indra, for example, as explained by the teacher Durga (earlier than V century Vikrama) is:

वैपुरेन ज्योतिषा वायुविभिन्तिस्य, इन्द्राश्येन | ए | १९ | II

i.e., the electric light paramāṇu or molecule (of the middle region) enveloped by the Vāyu molecule, is called Indra.

Note—Such physical powers, are thoroughly misrepresented by occidental scholars by wrong translations of the Vedas. Thus has been spoiled the very essence of all scientific knowledge.

5. On the pattern of this Rigvedic description is a passage in the Brihadāraṇyaka Upaniṣad also:

ग्रंथ: पाथा विश्व: पुराण: | ४ | ४६ | II

i.e., Subtle is the path, widespread, and the old one or eternal.

6. Another Yajurvedic text clarifies the position still further:

इमार्थ्यं एतलोकान् यथापूर्वः प्रदायत | मेन्त्रात सं ४ | १ | ३ | III

i.e., [The mundane Egg] caused the bestowal of these worlds as before.

7. Maitrāyani sanhitā IV. I. 12, repeats the same idea,
8, 9. Rigveda VI. 16,21, and VI. 22,7 also convey a similar idea.

This, then, appears as one of the Fundamental Laws of Physics that the creation of the Universe is governed by a course of cycles of dissolution and creation.

With this knowledge I now proceed to relate what happened after the formation of the Mahābhūtas.
Chapter VI

THE NIGHT AND THE GREAT OCEAN

Rātri—night. When the cycle of the previous universe passed into annihilation, and when the paramāṇus, the Tan-Mātrās, and the Mahān etc. have all merged into Prakriti, it was then a great night. The Almighty or the creator knows that state, and by His grace the seers also saw it, and gave its vivid account for the benefit of the world.

Salīla—The word salīla in this context means the state, when every subsequent form of matter had merged or had been absorbed in the original form, which is beyond transformation. During this salīla state, the distinction of individual paramāṇus or of their earlier forms is lost. Salīla means water also, but in the present context this meaning has no place.

Pitch darkness—Salīla state was the night period of the present cycle of the universe. Vāyupurāṇa¹ says, rātristu salīlavasthā,² i.e., the salīla state was the period of night. It is declared in the sacred or divine language of the Rigveda also:

तम ग्रासीसदमसा मुद्दम्प्रे प्रकेतं सलिलं सर्वम् हम्मु।

10 1 126 1 3 11

i.e., Darkness or Prakriti³ it was, by darkness shrouded or hidden, before this creation; unknowable, and all, whatever is now, or which we perceive, merged in the (primordial cause.)

Note—A.A. Macdonell in his Vedic Reader, translates the later half of this mantra as, “this all was water”. It would have been better, had he made the translation more clear.

¹ 100. 236.
Instead of "this all", this all that we perceive, makes the sense clear. Yajurveda 40.1, itself translates "idam sarvam", as "this all, whatever is in this changing universe." And "this all", i.e. Prithivi, Agni, the planets and the galaxies etc. cannot become water. Therefore the word salila means, in which all has merged. The translation is supported by a purana also.

W.N. Brown—"This all was an unillumined flood."¹ This translation is half correct. In this mantra, salila is not water.²

Manu—The greatest friend of mankind, and one of the foremost of the seers, interprets this mantra in the following way:—

"It was all darkness, unknowable, beyond any definition, beyond reasoning, beyond the region of human senses, and as if in deep sleep on all sides." I. 5.

Dhatri—The Almighty, the creator or the holder of the universe, according to his eternal desire, agitated the sleeping Prakriti. But for this agitation, no transformation of primordial matter was ever possible. Here it is that the Bhūta-cintakas, or the specialists in the knowledge of Mahābhūtās, strive in vain. Here it is that the Marxists have no recourse except to follow a fruitless task of dry imagination. Surely it is here that the thinking of an atheist becomes blunt. In reality, this systematic universe, with its eternal physical laws, is according to the eternal design of the Greatest Architect.

¹ Quoted in, "Heat in the Rig Veda," p. 68.
² It should be remembered that in Sanskrit in general, and Veda in particular, one word does not always give one and the same meaning. On the other hand, of a number of meanings of a single word, it is the context which fixes one meaning at one place. On it is based the greatest truth of philology, which was uttered by Vyadi (2800 B. V.) "the form and the meaning of words are known from the meaning of a sentence only, (Bhaasha ka Itihasa, or History of Language, 3rd. ed., p. 75. quoted from Bhartrti Hari (earlier than 3rd cent. Vikrama).
Ekārṇava state—The night period or the salīla state has another name also. It is, 'one-sea-like' state, which has already been described on pp. 33-35 under property no. 7 of the Real Element Āpah. According to it, at the end of the night period, when the Bhūtas or the Tan-Mātrās had again come into existence, the Āpah were:

1. Without Temperature—They were enjoying the state of Ekārṇava. which was void of any union with Agnih paramāṇus. It was according to Nilakaṇṭha, the commentator of Hari-vanśa, a state, where there was no temperature whatsoever in them.¹

2. No motion—And as a consequence of the above mentioned fact, these were motionless; for motion or gatiḥ is always due to Agnih, and their inherent motion was dormant. The Āpah were:

   भ्रागतागतिकः जैव तथा तत्संविलं स्मृतम् ।
   बायु १०० ११७। ॥
   भ्रागतागतिकं तदे यदा तु सतिलं बहु ॥
   बायु ७ ५४। ॥

   i.e., in that condition absence of motion had come.

3. Not vibrant—The Āpah were not śīghrāḥ; they were not vibrant.

4. Shrunken—These were shrunken,² or compressed, but not snowlike or ice-like. In the snow-like state of Āpah, the union of Agnih molecules, though very slight, yet remains. But the śarmāṇa or shrunken state is far beyond this.

5. Not fluid—Water is fluid, and this property comes in Āpah, when they join with rasa and become water.

Various stages—In the above stated study, it is essential to grasp the sense of four terms,—salīlam, Āpah, rasa or madhu and udakam or jalam. Ordinarily all these words mean "water" or "waters". Modern languages have no right equivalents for

¹ निस्तप्ये एकार्णवोवेतेन । १ ५० ५४। ॥
² Back, p. 34.
them, when these are used in their technical or scientific phra-
seology. So it is necessary to indicate the true significance of
these terms. It is as follows:—

1. *salila* = *sarira*, great night = one-sea-like state.
2. *narah* = motion or vibration-less state of *Āpah*.
3. *Āpah* = *nārāḥ*= all pervading; with no flow.
4. *rasa* = *madhu* (contacts with oxygen and hydrogen ?)
5. *udakam* = ordinary water.

I may be slightly deficient in drawing the above result,
but I have tried to give a fairly correct picture of it. It is
supported by the following authorities:—

1. अप: सलिलसम्ब: | दार वाल्मीकि रामायणः, उल्लकारः ४। ६।।
i.e., Apas is born of salila. This *salila* was *Prakriti* and
also its latter transformation *Mahān* (see back p. 2.)

2. आपो नारा इति प्रौक्ता आपो वें नरसूनवः | मनु ३। १०।।
i.e., *Āpah* are called *nārāḥ*; they are the offsprings of
*narah*.

3. सो श्रयो स्निजृत | वाच एव लोकात् | वागोऽवस्थ सासृष्यतः |
सेद्यः सर्वमप्नोऽत | यदद्य किच च | यदप्नोऽत तस्मादाप: |
यद्वाणोऽत तस्मादापः | शतपथ ब्राह्मण: ६। १। १। ६।।
i.e., The Lord created the [original] waters, from the very
world of speech (vibrations and tongue which causes taste and
juice); its very juice He created. The juice pervaded all that is
here. As it pervaded, therefore, [it is] *Āpah*; and as it covered,
therefore also [it is *Āpah*].

Note—The idiom of the *Brāhmaṇa* works requires a
long practise to understand it. My translation is just according
to it.

1 Samudra and sarira are rarified air-like. Sh. XIV. 2,3,3.
2 Look at another poor translation, “In the beginning this uni-
verse was waters, nothing but water.” Vedic Selections by
Keshitish Chandra, p. 387,
4. (क) यज्ञ स्तम्भ यज्ञस्तम्भ विरोधसन्दिग्धं। तस्य रसो दुधायप्रविष्का।
तेवेदाद्रिसंस्नेयसं प्रविष्काः। स्वन्दलेष ॥ शतो ब्राह ॥ द ॥ र ॥ ॥

i.e., where the head (upper part) of the great egg—Yajña got torned, its rasa (juice) having flown entered the Āpah; on that account, the Āpah (waters) flow.

The rasa requires an independent study. I have quoted the authority for the present, which is further clarified in the Mahābhārata:

(ख) तस्माच्चोचित्रिष्ठते देवादृश सर्वंभूतिहिताः।
भ्रमो न हि तेन यज्ञवते द्रवयं शानुवतति च ॥
शालितपरव ३५४ ॥ ॥

i.e., From that god (Hiranyagarbha), the affectionate of all, comes out the rasa (juice). Āpah get united with it and attain the quality of flowing.

(ग) रसो वै मधु ॥ शतो ॥ ॥ ॥

i.e., Rasa is Madhu.

(घ) रसादृ जलं समुद्रं तमं ॥ विश्वपुराणं ॥ श्राणं ॥ ॥

i.e., From rasa is born water.

Thus, whatever I have written above, is fully corroborated by proper authorities. This shows that water or more correctly Āpah, the element, spoken of by the Greeks and the Vedic seers is not the ordinary water, but it is Āpah or the original water. Modern science has yet to find out the exact significance, or interpretation of rasa, narah and nārāh etc.

Three States of water—According to Bhāratiya writers ordinary water exists in three states. These are:

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1 “Empedokles (444 B.C. †) called his elements “roots” and Anaxagoras called his “seeds”, but they both meant something eternal and irreducible to anything else,”
John Burnet, Greek Philosophy, 1915, p. 69,
Steam and Agni — It is important to note that steam or water vapours are regarded only as molecules of water in close union with a larger amount of Agni atoms.

From this viewpoint the Brāhmaṇa says:

\[ \text{ग्रहनेवं धूमो जायते} \quad \text{धूमाद ग्रह्यम्} \quad \text{ग्रहाद वृष्टि} \]

\[ \text{शातो} \quad \text{वृष्टी स्तं} \quad \text{स्तं} \quad \text{स्तं} \]

i.e., From Agni is born steam, from steam the cloud, and from the cloud rain.

Expansion of Ice — It is a well known fact with scientists that ice occupies more space than that which is occupied by water, which is converted into ice. Water at 4 degrees centigrade expands and up to zero degree it remains so, when it gets changed into ice.

This Fact hidden in the word Him:— The Jain teacher Hemacandra explains the word him in the following way:

\[ \text{वर्धते जलम् ग्रहन हिमम्} \quad \text{ग्रहित् चिल्लत} \quad \text{रू} \quad \text{रू} \quad \text{रू} \]

i.e., the [volume of] water increases, therefore [the root shows the real meaning of] him = ice.

Was it a gas — Some of the present day scientists have begun to surmise the presence of a gas or a gas-like substance at the stage, from which the sun, the earth and the planets came into existence. But this does not tally with facts. Truly has it been said in a purāṇa:—
i.e., once you contradict the existence of the five Bhūtas, you can not account for the working of the universe, which is nothing but a result of the Bhūtas.

Gas presupposes a chemical element—Now no ‘gas’ comes into existence without an earthy or a ‘chemical element’. It further requires a heat of a particular degree. A natural question, therefore, arises as to the form in which heat existed at that time, and the forces which created that heat. Moreover, the chemical element from which the gas originated, should also be known. Under the circumstances, when these factors are quite unknown in a logical series, the hypothesis of the presence of a gas is untenable.

Seers, on the other hand, have a straightforward answer about the origin of heat in the beginning of creation. It is that Agniḥ paramāṇus evolved from the Agniḥ Tan-mātrās, and a particular union of Agniḥ paramāṇus created heat. The process of its origin is found in the Brāhmaṇa works and Vedic mantras.¹ Modern science has so far achieved the knowledge of electrons only. It has also known the production of immense heat from a nuclear fission. But the whole process from the beginning of creation up to the nuclear fission is yet to be determined by it through experiment. It is sure that it will also have to admit the presence of Agniḥ paramāṇus during the primordial forms of matter.

The other part of the question is more difficult. When there was no earth, and hence no chemical element, how then came into existence any gas? These subtle questions I leave

¹ तनुनपातः प्रकोर् रोक्ते म्रकोर् द्विंतिः

The Agniḥ named Tanunapat is the grandson of Tanu, or the all pervading Apah.
for the abler people to decide. I, for the present, proceed with what small portion I have grasped from the ocean of knowledge of the seers.

Samudra Arñavaḥ—Just after the one-sea-like state of matter, originated the state, often called the Arñava ocean state. In the well-known hymn about the ‘account of coming into existence of the universe’, Rigveda X.190 has the first mantra:—

अष्टक्ष तत्तत्त्वतः भविष्यति। ततो रूपाः समुद्राः प्रशान्तः॥

i.e., There was the birth of the night i.e., previous dissolution; after it arñava ocean came into existence.

Note—I have not arrived at a fully clear conception of this state, and, therefore, am unable to give its translation in English.

Samudra and Madhu—Of the many mantras, which talk of this Samudra=ocean, an interesting and a clear one is quoted below:—

समुद्रात् समुद्रं समुद्रं उदारत्। ऋो ४१५॥

i.e., From the ocean, a wave, which contained Madhu, rose up.

Note—This mantra does not relate the condition of the present oceans of the earth. It should be remembered that the word Samudra (ocean) is in the singular number here. Moreover, the oceans now are of saltish water, while the original ocean was not such. In that ocean, a wave which contained honey, arose. The honey (?) wave was one of the causes of the formation of the sun. This is very clearly expounded by the unique authority Yāska (3100 B. V.) in Nirukta VII. 17. Yāska further states that Agniḥ helped in this phenomenon.

Again, this important mantra is in the context of the kindling and placing of the burnt Agniḥ=fire for the performan-
ce of the sacrifice. *Kāṭhaka samhitā* VII. 12, supports this fact. Therefore, a study of this, and other allied references is essential to get a clear picture of that state.

*Agnih and Waves*—Yāska has pointed out the help of *Agnih* in the phenomenon of the wave which contained *Madhu* in it. This connection of *Agnih* with a wave is finely stated by Patañjali, while explaining the *Rigveda mantra* VIII. 69, 12.

सूर्य सुतिरामिव। तद्र यथा—शोभनामूठम्य दुबिराम्। प्रतिनि: ।

प्रत्त्वः प्रविष्ट्य दह्ति । भ्याकरणमहाभाष्यम् ॥ ॥ ॥ ॥

i.e., For example, as *Agnih* entering into the inside of the beautiful vein of the wave, burns it, so [the seven inflections of a noun flow into the palate and burn it.]

*Agnih* molecules work in a wave, is to be tested.

However, I am for the present concerned only with the *Madhu* element which found its way into the primordial ocean.

**Ratio of Madhu and Āpah**—Future students of Vedic literature will have to determine the ratio of *Madhu* required to bestow the property of ‘flow’ to Āpah. Further, the type of union of these two substances will have to be noted.
CHAPTER VII

GARBHA—EMBRYO OR ANDA—THE EGG

1. Before describing the formation of the Embryo, from which the whole universe came into existence, the following five words, which the reader will come across in this chapter, should be kept in mind. These are garbha=embryo, anda=egg, Hiranyagarbha=golden embryo, Prajapati=protector of the progeny, and Purusa=the Lord. The latter three are the advanced stages of the embryo.

2. Birth of the embryo—The Apah pervaded the universe. The Apah molecules were then in an expanded condition. Then alone they could pervade. These Apah at first gave birth to a form of Agni=—called Apam Napat in the Veda. It should be remembered that Apah are considered mostly as feminine and Agni as masculine in Vedic literature. This special Agni or Apam Napat created the embryo:

स ै ै ै वृषाजनयत तासु गर्मि स ै ै विशुर्षष्यति त ै रिहृसिति।
सो श्रमां नपास्र प्रतिमस्तालवंनाध्यवेधें तनवा विशेष।

१७३ २१ ३५१ १३ ११

i.e., He, the virile [Agni], generated in those [Apah], the embryo; the embryo, like a child, sucks the [Apah], [and the Apah] lick the embryo; that Agni born of the Apah, of unfaded colour, entered with the body of another (=with another molecular arrangement i.e., of fire) into [the sacrificial fire].

3. Purana version of the same—The puranas describe this incident in a vivid way. I quote below two verses from Vayu purana, ch. IV;—
GARBHA—EMBRYO OR ANDA—THE EGG

पुष्पानिषिद्धत्वात् अभ्यकतानुग्रहेण च।
महाभियो विशेषात्मा अण्डमुत्पादयति वै। ॥७४॥
एककालं समुपर्यं जलबुद्वुद्वरभूतं तरु।
विशेषोम्प्रकृतमनवं वृहत्तुदकं च यत्। ॥७५॥

i.e., Being ordained by the Almighty God, and by the favour of Prakriti (=the primordial cause), [the categories] Mahā to the five Mahābhūtas create the egg. [That egg was born in a moment, just like a bubble of water. Ākāśa and the paramāṇus of the four Real Elements gave birth to the egg, along with water, which was in the earlier state of Brihat.]

Note—The meaning of Brihat is not clear to me. Viṣṇupurāṇa 1. 2. 51 possibly takes, Brihat as an adjective of āṇḍam.

4. Another Vedic Mantra—The following is another Rigveda mantra which throws light on the birth of the embryo. It adds some more points connected with this phenomenon:

तमिद्ध गर्भं प्रयस्म द्रव्यां प्रापो यज्ञ देवा।
समग्रावलं विश्वे।
ब्रजस्व नामवाच्यवेशारमिति यस्मिन् विश्वा भूवनानि तस्य। ॥

ṣeṣ १०६ ८२ ६।। यज्ञः १४५ १० || तैः सूः ४। ६। २। ३। ॥

i.e., That very embryo, the first [of all creations from the paramāṇus] the Āpah bore, wherein all the gods (physiological powers, formed of the multiple combinations of paramāṇus) gathered together. This one, was entrusted to the navel (middle) of the unborn (=Prakriti) in whom rested all the planets, the stars, the galaxies, and the earth etc.

Note—Griffith translates bhuvanāni of the mantra, as “things existing”, while Geldner as ‘creatures’. Both these translations are due to the fact that Principal Griffith and the laborious Professor Geldner were quite ignorant of the Vedic story of creation. Under the lame lead of the bigoted Prof,
Rudolf Roth they discarded the side of all helpful literature, and thus did injustice to the sacred Vedic lore.

5. Still another phase of the above—Again the well-known Hiranyagarbha hymn of the Rigveda contains the following mantra:—

श्रापो ह यद्र बृहःत्वीविस्वस्मायन् गर्भे दधाना जनयस्तीर्भिनम्।

ि।०।१०।।१२।।७।।

i.e., Āpah, which were certainly great, pervaded all, holding the embryo, and producing Agniḥ.

Note—In this mantra, the Āpah are called brihati or great and under no. 3 above the Vāyu-purāṇa says that udaka or water was Brihat. Therefore, it is probable that the purāṇa is translating the present Veda mantra. The real significance of this term should be studied.

6. Growth of the Embryo—The embryo was born. It had to grow. Therefore the Yajurveda says:—

देवीराप एष वो गर्भस्तु सुप्रीतः सुभृतः विभृत्। ५।१६।।

i.e., O ye Divine (=lustrous) Āpah! this is your embryo (=this is born of you); bear him well beloved, and well nourished.

7. The Embryo takes birth after the menses—The law about the formation of an embryo is that the embryo in a female is born after the menses period. The embryo of the universe also had to pass through the same conditions. So another mantra observes:—

सुम: स्वयंम: प्रथमोऽन्तरम्भल्यः प्रस्तुतोऽवांसि।

दधे ह गर्भस्तितिस्वयं यत्स जात: प्रजायति:। वज्जुः २३। ६३।।

i.e., The well being, the self existent, the first [of all creations from the paramāṇus], within the great ārṇava (≡ocean of the pervading Āpah molecules), held the embryo, which
was in proper time or season (=after the menses period of the Āpāh), whence was born Prajāpati.

Note—Eggling (Sat Br. XIII. 5, 2, 23) and Caland who followed him (Śāṅkh. Śr. sū XVI. 7, 1) translates garbham ritviyam as “the right germ.” This does not convey the exact sense, nor it is the correct translation.

8. Proper Time—In number 5 above the mantra observes that the Āpāh were producing Agnih; consequently the proper time approached. Of what kind was this Agnih should be studied in the Vedic verses.

9. The Embryo grew—Well-beloved and well nourished the embryo grew. How the Āpāh mothers and Agnih, the father, helped in this growth is not yet clear to me.

10. Hiranyakarbah—The golden embryo. Agnih gave light and the embryo began to shine. The great Manu, the first law-giver of mankind, the seer, whose name was adopted in one form or the other by the succeeding prophets⁵, beautifully describes this fact:—

\[ \text{तद्दश्मभवत् हृदं सहस्त्राषुस्माप्रभम्} \quad \text{मनु} \quad ११ \quad ६१।। \]

i.e., That egg became golden, it was just with the lustre of the sun.

A purāṇa also throws light on the colour of the egg:—

\[ \text{कुर्मभास्यायी भवेद याहकृ प्रतीच्या दिष्टा चन्द्रम्} \]

\[ \text{प्रारंभित: शुचिपक्षस्य बुधुरुप्यस्य तद् विषम्} \quad \text{बायु} \quad ४४।। \quad ४४०।। \]

i.e., As is the moon, when it is in the western horizon and in the Kumbha or the 10th house of the Zodiac, from the beginning of the bright half of the month, so was the beautiful form of the egg.

11. A more clear picture of the Hiranyakarbah is presented in the following Rigveda mantra:—

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¹ Manu, Moses, Minos, Moses,
The earth, not of course the present one was in the lowest part of the embryo; how it separated from it, will be explained later on.

12. Brāhmaṇa work explains—Satapatha Brāhmaṇa explains it at length. It is in the natural line of these works. They are named Brāhmaṇas, for they explain the Brahma i.e., Veda. The extremely metaphorical, yet the clear language of the Brāhmaṇa runs as follows:—

\[\text{प्रापो ह वा इदमश्र सतिलमेवास् ता ब्राह्मणं।। कथं नु प्रजामयमहिं इति।। ता प्रथाम्यस्।। तास्तपोल्पप्पत्।। तासु तपस्तप्या-\]
\[\text{मानाशु हिर्यमाण्ड सम्भूम।। प्रजाती ह तथि सन्तसरम् ब्राह्म तदिवं हिर्यमाण्ड यावतें सन्तससर्व सेली तावतु पर्य्य्नलव।। तत: सन्तससरे पुजयः समभव।। स प्रजापतिहृः।।} \]

i.e., Verily, in the beginning this (universe) was Āpah, which were only a salīla (=in which everything was merged). The Āpah desired, “How can we give birth to progeny?” They toiled and performed penance. When they were doing penance (=when Agniḥ was coming into existence) a golden egg was born. The year, indeed, was not then in existence. This golden egg floated in a circle for as long as the space of a year. After that in a year’s time, the puruṣa was born (=the egg got converted into the form of a MAN). He was Prajāpati, the protector of the progeny.

Golden—Sat. Br. says:—

\[\text{स्तपेत तत्र। प्रजापतिहिर्यमाण्डस्तत्र श्रात्मनोदकुहः।। तस्मातृहिर्यमं-\]
\[\text{हिर्यमं प्रजापतिरिति।। शाख्य १०।। १। ६। ६।} \]
i.e., this was the final form. *Prajāpati* then finally made a golden form of his body. Hence they say, *Prajāpati* is golden.

13. **Prajāpati or Purusha**—The above is a true description of *Prajāpati* or *Purusa*. Without a full knowledge of these various aspects of the embryo the connected Vedic *mantras* can never be understood. And along with it a knowledge of the Gods (=physical powers), mentioned under no. 4 above, is also essential.

This *Purusa* is the subject matter of the famous *Purusa* hymn of the Vedas. It is, however, a pity that Christian professors like A. A. Macdonell and others, who do not understand many portions of the Holy Bible even, have given quite, unintelligent translations of this hymn.

14. **Brahmaṇa of Tāṇḍin**—The *Brahmaṇa* taught by the sage Tāṇḍin reads:

प्रजापतिर्वं इममेक्म भासीतुः नाहसीत्व सन्निरासीतुः ।
सोऽसिस्मन्तन्ते तमसि प्राप्तयतुः । १६। १। १।।

i.e., *Prajāpati*, certainly, was this [universe] alone [at first], neither day was [there], nor night. In this blinding darkness he, moved forward.

15. **Jaimini explains at length**—Sage Jaimini, the disciple of *Krīṣṇa Dvālapāyana Veda Vyāsa*, keeping in view the various *mantras* quoted above, gives a lengthy exposition of the whole process of creation, which begins with *rita* and *satya* and ends at the Golden egg.

It is as follows:

तद्द यत् ज्ञत्तमम् इति वाक्ष्यत् । यत् सत्यम् इति प्राणस्यः । यत्तपि
इति मनस्तुते तेषां मन्त्रमेव व्योपितरसीतुः ।
तान्येकमभवन्त तदेकं भूतवा
एतःनानेन व्योपिता-भ्राप्यत । तद्भवद् यथा मधवस्था लाव्या-
स्थासिकता स्वादूः ज्ञतिविष-एवम् ।
तदैकक्षत हृत्ताधस्तात् प्राणं करवा
i.e., That which [was] rita (=the eternal Law) it was speech (=sound waves), that which [was] satya, was prāṇa (=a phase of Vāyu), that which [was] tapas (=penance) was the [universal mind]; their very food was light (=working of a form of Agniḥ); all these became one (or mixed), that becoming one, began to grow in size on account of this food, the light. It became just of the type as becomes the honey when sprinkled over the rice, or something is in motion. He desired, look here, I make prāṇa on the lower side. He made the prāṇa in the lower region. Just as there is space in the lower region [of the uterus] of a woman. From that the Āpah were produced with the sound (=speech) bal-bal. Then it was the great Āpah, in which was merged this universe. These were those Āpah. In those Āpah the waves attained the sound phāl-phāl. That moved forward as a golden egg.

Note—The text requires improvement; however I have given a working or a tentative translation. The working of light as food is remarkable.

Bala-bal,—Praśastapāda also writes that Vāyu in the form of trembling wind was very strong. This gave rise to Āpah, which were born with the sound Bala-bal. Then followed the one sea-like state. In that state was born the egg; the waves then were giving the sound phāl-phāl, highest pitch.

"Speculation"—Some people, who are not well versed in Vedic technique, will call it "speculation". But in reality such is not the case. The seers express in a language, most suited to the subject matter. Space does not permit me to write a full commentary on it. My present purpose is served with
the idea of the birth of the Golden embryo.

Egypt reiterates the same Truths—we know that the ancient Egyptians learnt the sacred knowledge from Manu and other seers. Manu was the first king of Egypt. Herodotus, the ‘Father of European history’ writes:

“The priests [of Egypt] said that Men was the first king of Egypt.”

Note of the editor of the History of Herodotus—

“Manetho, Eratosthenes, and other writers agree with Herodotus that Men, or Menes (the Mna, or Menai, of the monuments) was the first Egyptian king.”

Now look at the Egyptian account of creation. I put it side by side with the Vedic account. The marked similarity will be apparent at a glance.

**Egyptian**

There was a time when neither heaven nor earth existed, and when nothing had been except the boundless primeval water, which was however shrouded with thick darkness.

At length the spirit of primeval water felt the desire for creative activity.

The next act of creation was the formation of a germ, or egg, from which sprang Ra, the sun God within whose shining form was embodied the almighty power of the divine spirit.

**Vedic**

There was neither dust, nor the heaven which is beyond.

There was prakriti, shrouded with darkness; this was all salila (—primeval water).

The Āpah desired, ‘How can we give birth to progeny?’

a Golden egg was born.

Hi-ra-yà garbhà, with the lustre of the sun.

He was Prajāpati. He was Puruṣa.

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2. Books on Egypt and Chaldees by E.A.Walles Budge, 1908, p. 22.
3. ibid, p. 23.
4. Rigveda, X, 120, 1.
5. Rigveda, X, 120, 3.
6. See, no, 12 of this Chapter.
7. ditto.
Note—The Egyptian savants distinguished the primeval water from ordinary water.

Bible repeats the same—Moses, the prophet of the Jews, was fully acquainted with the knowledge, known to the Egyptians.

It is said in the book of The Acts:—

“And Moses was learned in all the wisdom of the Egyptians.” (VII. 22).

Therefore it is no wonder that he repeated many Vedic truths which came to him through the Egyptians. In this connection the following passages should be noted:—

**Genesis**

In the beginning God created the heaven and the earth.

And darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

**Veda or Brāhmaṇas**

१ शाबामूही जनयन्तु देव एकः।

१० रो १०१ दृष्टि श्री।

The one God created the heaven and the earth.

सोष्ठित्वमये तमसि प्रासपति।

No. 14, above

हिरण्यागर्भं … गयं प्रवत्ति।

No. 12, above

The Vedic words *Prajāpati, Ekdevaḥ, Hiranyagarbhāḥ,* and *Puruṣāḥ* which all mean the Almighty God, and in the physical sense, the Golden egg etc. should be carefully studied. Otherwise the sentence, “the Spirit of God moved upon the face of the waters,” can never be understood. The Holy Bible has preserved this sublime truth through ages. The key of its right interpretation is preserved in Vedic works only. Spirit of God is the very *Hiranyagarbha.* It alone moved upon the [primeval] waters. The Almighty God is all pervading and is not a finite spirit.

Marvellous is the similarity of diction. Look at the words “deep” and “waters”. Deep is the ocean, the *Ekārṇava*
ocean, shrouded with darkness. It is in the singular number and the "waters" in the plural are the Āpah, always used in the plural. Who can explain the depth of the Biblical language, who does not know the Vedic literature?

Many millions of eggs—Such an egg was not one only. These were many, and the number exceeded hundreds of millions. The Viṣṇupurāṇa reads:—

मन्द्वादा तु सहस्राणां सहस्राण्युतानि च।
ईद्वादा तथा तत्र कोटिकोटिशतानि च॥ ॥ २१ ४१ २७।।

i.e., Such eggs were a thousand of thousands, and ten thousand of thousands, and hundreds of millions.

The countless number of the eggs is the cause of the vastness of the universe.

Prajāpati, his size, his body and his inner form is also described in the Brāhmaṇa works. I do not wish to go into these details and, therefore, close this chapter here.
CHAPTER VIII

DURATION PERIOD OF GOLDEN GERM STATE

Embryonic State—Almost all works which relate the story of creation, state the duration period of the embryonic state of the Golden germ. Five such passages are given below:—

1. A passage of the Sat. Br. already quoted on p. 106, no. 12 states: “The year, indeed, was not then in existence. This golden egg floated in a circle for as long as the space of a year.”

2. Sage Jaimini, as quoted on p. 108 above, after describing the birth of the Golden egg, says:—

इत्यहुः प्रतिमृगः कपालमासीद्र रज्जतुमुत्तरम्।
तत्त्वज्ञयं देवसंवस्तस्कारा यथिवता निमित्तमम्मतः।
सहायति वा दुम्नान्। दुम्ना हूँ नाम
तस्मात प्रतिमृगः । याबासेव संवस्तरः: तावस्तः: संवस्तसरस्य प्रतिमा:।
दुम्ने युर्द्वः स्म संवस्तर्मे विजानिन्तिः। ३ । १६५ ॥

i.e., The lower cup of the [Golden egg] was pale, yellow, and the upper one silver coloured. That having slept for a hundred years of Gods became prepared for being broken, or after a thousand dyumnas. Those, which are called dyumnas existed even then. As is the span of year, so many are the images of the year. By means of the dyumnas [the learned] know the year.

So it is clear the Jaimini means that the sleeping condition of the Golden egg lasted for a hundred years of Gods. By a hundred years he means one thousand dyumnas. The significance of dyumnas is not clear to me.
3. Now I quote from the Aitareya Brāhmaṇa. Its teacher is older than Jaimini and his predecessor Madhyandin. He says:—

[प्रजापति:] वाचमयच्छुत | स संवत्सरस्य परस्ताद्र व्याहृत | द्वादशक्त्व: | ऐ० जाँ २। १३।।

i.e., [Prajāpati] gave out the word. He spoke after the period of one year.

4. Manu, who is earlier than Aitareya, observes:—

"The Glorious and Adorable lord, having resided in that egg for a whole year, then of his own volition, divided it into two halves."

And out of those two halves he formed heaven and earth.

5. Vāyu purāṇa, which is about three centuries after the period of the Mahābhārata war, states:—

श्रवस्वर्ग सहस्त्र संवत्सर वायुना तत्र दिष्टा कुतम् | २४। ७४।।

i.e., At the end of a thousand years, the egg was divided into two halves by Vāyu or wind.

Thus Śatapatha, Aitareya and Manu state one year as the period of inactivity of the golden germ. Jaimini states this period to be a hundred years of Gods, and the Vāyu purāṇa as one thousand years. I do not go into the cause of difference between them. I have only to show that the state of Hiraṇyagarbha remained for some time, and later on the state of Prajāpati or Puruṣa or Yajña began.

Prajāpati—With the state of Prajāpati begins the period whence the creation of earth and the planets etc. begins. While translating the Vedic texts, therefore, this fundamental difference of the egg, the golden egg, and Prajāpati or Puruṣa or Yajña should always be kept in mind.
Chapter IX

PRAJAPATI, THE LORD OF SUBJECTS
CREATION BEGINS

1. It has been said above that Hiranyagarbha assumed the form of Prajāpati, who is described at length in the Brāhmaṇa works. A good deal of Vedic sacrifice, representing the various stages of the story of creation, is connected with Prajāpati. The creation being a long process, the accounts there of are also long. These appear 'tedious' to those, who are ignorant of this science. On the other hand, many observations are simple, clear and interesting, and are therefore reproduced here.

2. Dimensions of Prajāpati—It is remarked in the Tāṇḍya Brāhmaṇa:

यावान् वेप्रजापति: ऋवः: तावान् तिर्यङ्गः। ॥ १२॥
यावल्त इने लोका ऋवः: तावल्त तिर्यङ्गः। ॥ १३॥ १४॥ ६॥

i.e., So big as Prajāpati was vertically, so big was he horizontally.

So big as these [three] worlds are vertically, so big are they horizontally.

It should be understood that our three worlds are a part of the universe. When these three worlds are confined, the universe is also possibly confined. It should, further, be noticed that the Great Egg changed its shape slowly and slowly, and at last was of the above mentioned shape.

3. Prajāpati and Yajna—Prajāpati is often called Yajña. This name signifies definite but deep meanings. Here it connotes the sense of the union of various elements and the bestowal of individual forms to them. So it is said:
4. Similarity to an Embryo—In order to give a clear idea of the Embryonic state of Prajāpati, the teacher Madhyāndin compares it with a human embryo. An embryo is covered by the amnion and an outer membrane (and placenta). So also was covered Prajāpati. It is, therefore, said:

सा वे शाणी भवति । मुद्रपसदिति स्वेब शाणो । यत्र वे प्रजापति-रजायत गर्भो मूल्या-एतस्माद वजालु तस्य वन्निर्विक्रम्यमत्वासीणः

ते शाणः । तस्माते पूर्वयो वान्ति । यदस्य जरास्वासीलु तदन्तिव्यत-वस्नम् । प्रन्तरं वा उल्लभ जरायणी भवति ।

i.e., It, certainly, is made of hemp. In order to be soft or elastic, certainly therefore, it is hempen. Where, certainly, Prajāpati was born, having become an embryo, from this Yajña, that which was nearest to him, the amnion, became hempen threads: hence they smell putrid. And that, certainly, which was his outer membrane (and placenta) the garment of the consecrated [represents] that. Certainly the amnion lies under the outer membrane.

5. Note—Vedic sacrifice, in reality, is nothing but a representation of the happenings, which took place in nature during the creation of the universe. This sublime and divine knowledge in its various aspects, repeated in different sacrifices, keeps alive the whole story of creation, along with the beautiful, absorbing and adorable working of the Almighty. R. Roth, Max Muller and their disciples, could not or did not like to understand it, and consequently spoke ill of it.

6. Heavenly Builder—Prajāpati, under the will of the Supreme Lord, became the heavenly-builder, and whatever he
spoke, the very object separated from him and came into existence. It is said:—

स्वप्न वै मृत्तम प्रजायत: प्रजा प्रतुष्म |...|
स यदृ वाचा-
प्रवर्तत तदभवत् | काठकसं ॥ ७० ॥

i.e., Prajāpati, verily, having become the heavenly builder or Artificer created the offsprings. What he spoke by the speech or what word he uttered, that it did become.

7. Prajāpati and the word—The magic of the word is unparalleled in the history of the world. Parallel to the utterance of the word, the objects of the universe have come into existence. The word was a natural outcome from Prajāpati. The word or the sound waves did come out when a body separated from its parent, the Prajāpati. I will only quote three passages which relate the whole phenomenon:—

क) प्रजापितिवै इदमेक धारीः | तत्स वाचेव द्वमासीतु ।
वाग्न ह्वृतिये । स एके ते कामक वाचे विसुजा ।
हत्य वा हदं सवर्षी विहदवल्लेख्यति । हति । स वाचे भ्रशृवज्जत ।
सदै सवर्षी वीववल्लेख्यति । गौरवीवातनान ।
यथान्याण घारा सन्तत एवम् |

तापिक्षु ॥ १४ ॥ ॥

i.e., Prajāpati, certainly, was alone [before] this [universe]. The word (=speech), certainly, was his only possession: the word was the second. He desired: let me emit this very word, it will pervade this whole [space]. He emitted the word and it pervaded this whole [space]. It rose upwards and spread, as a continuous (=well joined) stream of water.

8. Caland’s translation—The above is the translation of the text done by W. Caland. I have made some minor changes. Dr. Caland has translated Vāk as “the Word”. He certainly had in his mind the following sentence of the New Testament:—

“In the beginning was the Word, and the Word was with God, and the Word was God.” (St. John, ch. I). Undoubtedly
the ancient knowledge, which is the common property of mankind, reached St. John as well.

(ख) स पूरित व्याहरत् स भूमिमसृजत् । तैः श्रृऽ ॥ २। ॥

i.e., He [the Prajāpati], spoke the Word bhūḥ, he created the earth.

(ग) प्रजापतियंद्रे व्याहरत् स पूरितेर्वेव व्याहरत् । हमाम् असृजत् ।

i.e., Prajāpati, what, in the beginning, he spoke, he spoke bhūḥ; he created this [earth].

Such passages are many, and need not be multiplied here.

9. How it happened—Prajāpati was amidst the Āpah-ocean. The Āpah were pervading like air (≡earlier Vāyu condition). The sound-waves in those pervading Āpah travelled. It has been clearly stated:

स प्रारम्भे पूर्वसः स्वरिति व्याहरत् । जैः श्रृऽ ॥ ३। ॥

i.e., He (≡Prajāpati) spoke the three great Words: bhūḥ, bhuvaḥ, svah in those pervading Āpah.

These were the three Words, which appeared simultaneously with the birth of the three worlds. Bhūḥ with the separation of the earth, bhuvaḥ with the formation of the middle region and svah with the separation of the heavenly region.

10. Word and Meaning—Meaning is nothing but the very object which came into existence at the utterance of the Word. Therefore in the original language of mankind the Word and its meaning are inseparable. This is the language of Prajāpati and the Gods. The seers saw and heard this sacred language. They did see this germ language on account of their love and the kindness of God. The so-called scientific and atheistic intellect can never find a more true and a satis-

1 वृहस्पति प्रथम वचो प्रथम वर्षेत्त नामयेऽवधाना: । वदेयां श्रेयं यवरि-प्रमाणीस्लुः प्रेष्या वदेषा निहितं गुहाविचा: । जैः ॥ ३। ॥
factory solution of the origin of language. I have no space here, but really a separate volume is required to set aside the imaginary theories of the pseudo-philologists and lay before the yearning man the whole process of the origin of language.

11. Bible proclaims the Truth—Thanks to the fate of the Western world. The first book of Moses has preserved, though brief hints only, of the account of this Word and its results. I quote the following passages from chapter I of the Genesis:—

3. "And God said, Let there be light: and there was light."

6,7. And God said, Let there be a firmament......: and it was so.

9. And God said, Let there be waters under the heaven he gathered together unto one place, and let the dry land appear: and it was so.

Enigma for Jew Doctors—In para 5 of this chapter, light is equated with Day and darkness with Night. This was the first day. Then in paras 14-16 there is an account of the lights." These serve "for signs, and for seasons, and for days, and years." Again it is said that these lights "give light upon the earth." Para 19 says that this was "the fourth day." Now any intelligent reader will at once note the fact that in para 5, in the account of the first day, the word "light is in the singular number, and denotes the "Day". But this "Day" was prior to the birth of the "lights", which "give light upon the earth." These lights are the sun and the moon. This was on the fourth day. Then arises a natural question as to what was the "Day" and what the "Night", described in para 5. This was certainly before the creation of the sun and the moon. Now, the conception of the "Day" which was before the existence of the sun and moon, should be understood. It is an intricate problem for the Jew Doctors.
12. **A Simple Solution**—I have stated, on the authority of the Book of “The Acts”, on p. 10, that ‘Moses was learned in all the wisdom of the Egyptians.’ And the Egyptians had imbibed their knowledge from the Vedic seers. So though Moses understood a good deal of the story of creation, yet his account of it as found in the Bible today, being very very meagre, was not fully intelligible to very many people. No doubt, the “Day” of Moses is the Day of Brahmā, or the *Brahma Din* and the “Night”, the dissolution period, or the darkness period of this universe. A clue to the first three “Days” can also be traced. Christian scholars have created difficulties in their own way, by making wrong suggestions; but in reality there can be no other straightforward explanation, which may help to solve this riddle.

13. **The Word again**—I was writing about the Divine Word, and the above was a digression only. We come across another phrase: “Let it be”, in the Biblical account. It also has a wonderful similarity with the account of the *Brāhmaṇa* works. It is said:—

> तत् ब्राह्मणसमवर्तत । तदस्मयमृत्व । शस्तु हति, शस्त 1. 
> भूयोभस्तु । इत्येव तदनवीत । शतपश्च ब्राहम ६१ २। २। २०।।

i.e., Thence or then an egg was born. He touched it. Let it be, Let it be; again Let it be. This very [word] he spoke.

14. **No Prejudice**—Short sightedness will have to be abandoned, and prejudice will have to be cast aside. The theistic world will have to realize that the greatest truths of nature are with man from the earliest days of human history. Truly was a part of this truth recorded by Megasthenes:—

> “All that has been said regarding nature by the ancients is asserted also by philosophers out of Greece, on the one part in India by the Brachmanes (＝Brahmanas), and on the other in
Syria by the people called the Jews."

This shows that the three nations had similar ideas about the working of nature. The similarity in their statement is not only noticed by me, but was well known to the Greek writers as well.

15. Prajāpati Yajna and the Vedas—The creation followed the word of Prajāpati. This will be recorded in the following chapters. Here I wish to draw the attention of the reader to the fact that Prajāpati not only spoke some mono-syllabic and bi-syllabic words, but the vibrations which represent the Vedic mantras were also created by him. Says, therefore, the Rigveda mantra :

\textit{तस्माद यज्ञात् सर्वमहत् ऋचः सामानि जातिरे।}
\textit{छुन्दाति जातिरे तस्माद यज्ञस्तम्यावायत॥} 
\textit{व्रजौ १०१ ६०१ ६१।}
\textit{i.e., From that Yajña (or the All-knowing God, who worked through the agency of Prajāpati), who is to be adored by all, were born the Rigveda, the Sāmaveda; the Atharva was born from him and the Yajurveda from him was born.}

Vain efforts have been made to try to prove that the Vedic formulas are expressed in a human language. However, this is not the place to discuss this point here.

16. Standing North-East—To resume the subject proper. There are references to the position of Prajāpati, in which he created the planets etc. It is said :

\textit{(क) ब्रधो तिष्ठनिः बीयेवतम:।} १११। \textit{उद्धः वै ब्रह्म तिष्ठनूः} 
\textit{प्रजापति: प्रजा प्रसजत।} २२। शालो ब्राह ६। ६। २।}
\textit{(ख) सः स विष्णुः सः।} १११। \textit{एतः तत् प्रजापति—} 
\textit{विष्णुकमेवशद्धः प्राङ्ग तिष्ठनू प्रजा आसूजत।} 
\textit{शालो ब्राह ६। ६। २। ११। १२।}

\textit{1: "Ancient India as described by Megasthenes, Frag. XLII, Calcutta, 1926, p. 103.}
And, then whilst standing one is strongest. Standing, certainly north-east, Prajāpati created the offsprings.

He who is, is that Viśnu, Yajña is he........... That Prajāpati by means of the Viṣṇu strides, standing towards the north east created the offsprings.

17. What is North-East—As a rule the conception of north-east is ordinarily bound with the sun. But at the time when Prajāpati was in the course of creating the offsprings, the sun had not yet come into existence. What was then the north east? A reply to that is also found.

18. North—In Vedic science North is the direction, where Rudra works. This Rudra is a transformation of Agniḥ, and especially of its electric form. Even now, this dormant electricity when united with the electricity of the clouds creates abundance of lightning. Therefore it is said:

अष्टेतस्यामुद्दीध्या दिव्यि भूविष्णु विचोति | प्रो व्रातः ॥

i.e., And now in this Northern direction flashing or lighting is of the highest degree.

This fact is always noticed during the rainy season. Even according to a late lexicographer Amara (I. 1,36), of the eight forms of Agniḥ, which comprise Rudra, lightning is one.

Rudra pierces Prajāpati—Rudra penetrates into or pierces Prajāpati is noted by Altareya :

स [प्रजापती रुद्रेण] विह ऊष्म उद्यमपतोऽ तमेत गुण:
(==मृगशीर्षकावशम) इत्याचक्ष्ते | ऐऽ व्रातः ॥ ॥

i.e., That Prajāpati being pierced by Rudra shot upwards. That lunar mansion is called the Mrigāśīraḥ.

It is well known that a part of Prajāpati shot upwards. This piercing was not an ordinary affair. Rudra came

1 युग्म (वर्षीयी) वे स्रोतस्य विदित् | तैऽ व्रातः ॥ ॥
in a definite position at first and then aimed or attacked. So it is said:

तेः श्रेष्ठस्मायर्य विग्याधि |

“Rudra, taking aim, pierced him.” (Sat. I. 7, 4, 3.) This working of Rudra or electricity should be further studied.

Higher Word—According to Sat. Br. III. 2, 3, 15 the word or speech sound is higher here [in the north]¹. This density of sound is some-how connected with the electric particles.

Rudra is one of the earliest creations.² So the northern direction referred to above, was distinguished on account of the presence of Rudra particles in it.

19. East—Just like the north, the east was distinguished on account of the presence of Agniḥ in it. It is explained:

प्राचीनेऽव विख्यातः || प्राचीने प्राप्र न || श्रो भ्रो रू || श्रो भ्रो श्रो रू ||
i.e., Through Agniḥ they recognised the eastern region. This Agniḥ was also an earlier creation.

20. Fixed Directions—The directions due to the sun change according to the seasons, but the natural directions due to Agniḥ, Rudra and other physical powers do not change. These physical powers form the magnetic field.

21. Prajāpati’s creation—Why Prajāpati faced the north-east, can only be guessed by supposing that Agniḥ and Rudra must have helped through certain vibrations, in the process of creation.

22. Raised upwards—Another fact is also noted in this connection. It is said:

ऋघ्बेः यो हि पशः: पस्युव देतो दशति || प्रयो ऋघ्वेः हि प्रशापति: प्रजा प्रसुरुजः || मै० स० १ १०१ ६०३ ।

¹ तस्मात् उत्तराः हि वाक्याधि || श्रो भ्रो रू २:२:१५४२:१५४२

² वेदानां च ऋघ्वी दानां च ताराय च पुर्वम्भु: || महान्रवः सहस्वावः स्वामावः वाहुवायुः || मै० स० २१६२:२१६२:१५४२
i.e., Raised upwards, certainly, the animals discharge semen in the [female] animals. And thus, raised upwards, certainly Prajāpati created the offsprings.

24. Sacred Thread and Prajāpati—Vedic Aryans wear the sacred thread. None of them reads the Vedas without undergoing this ceremony. The cause is apparent. Prajāpati who gave utterance to the sacred Om, and later to the Vedic mantras, had a natural sacred thread-like form round him. Therefore the sacred thread represents the very form. Look at the following mantra which fully corroborates my statement:

यज्ञोपवीतं परमं पवित्रं प्रजापतिवेष्टत् सहस्रं पुरस्तात्। काठक ज्ञो।

पृ० ७२।

i.e., The sacred thread which was worn by Yajña Prajāpati, and which brings a man near sacrifice, is the purest of the pure and was natural or simultaneous with the birth of Prajāpati, in the beginning.

It is no mere imagination of a fertile brain, no concoction of an idle man, who wants to create faith, and no "twaddle of an idiot." ¹

Four Rings round Jupiter—It is a well known fact that four clear rings are seen round the planet Jupiter, by strong telescopes. Prajāpati had a sacred thread-like formation just like the rings of Jupiter.

Countless Eggs—Purāṇas state that the eggs were countless in number, and the whole universe is a result of those eggs.²

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¹ Max Muller,
Vayupurana, 49, 151.
Chapter X

PRAJAPATI PROCREATES
Birth of the Earth

1. Earth Names varying with its forms — Bhūmi or the earth in its original state, was the first to be created by Prajāpati or Puruṣa. The world of bhūmi with its surrounding atmosphere which assumed the present form slowly and slowly, is called the bhūr world.¹

2. Upodaka or watery world — This Bhūr world has another name also. It is called the Upodaka—watery, moist or wet world, in Yajurveda xxxv.6. More accurately it means, the world in the vicinity of water. This name is repeated in the Jaimini Brāhmaṇa · III. 347. It definitely informs us that the form of water, which we have on this earth is a special gift of this planet, while there may be other planets which do not enjoy this privilige.

Although the atmosphere of the moon is full of Āpah particles and moon is often called as connected with udaka, yet I am not sure about the form of water in which it exists on or about the moon.

3. Prithivi—I will later on state the prithivi form of bhūmi. It is almost the state, in which we see the earth now. This prithivi is again expressed by more than twenty names; all indicating its different forms and functions. The wonderful nomenclature throwing light on the fine differences of the state of the earth is missing in various languages, which are the descendents of Sanskrit language directly or indirectly.

4. Aditi—Another name according to a later condition of

¹ Yogasutra, Vyasa bhashya, III. 26.
of the earth is Aditi. I am not able to understand it fully. The following passage helps to get some notion about it:

\[ यदृ तदर्थत तदविदति: | यदप्रथत ततू पृथिवी। यदभवत् तदः \\
\text{भूमि}: | \text{काठक सं}=121।
\]

i.e., As it took, on that account it was Aditi; as it spread, so Prithivi; as it came into existence, so Bhumi.

Note—The significance of all these expressions is rather difficult to follow.

5. First Creation—I have already said that the Golden egg after an year (of the Gods) assumed the form of Prajapati, Purusa or Yajña. He was, then ready to generate offsprings. The first of His creations was bhumi or the earth. But it should be remembered that it was not the present earth. Its original form will be described below.

6. A difficult problem—I have said that the earth was the first creation. This statement is based on the verdict of the seers. The difficulty of the problem was well realized. It has been beautifully expressed in a Vedic mantra, pertaining to heaven and earth thus:

\[ कतरा पूर्वी कतरापरालो: कथा जाते कथयः को विवेद । \\\n\text{विष्णु त्मना विभूति यद्द नाम वि वर्तेत अहूरी चक्रयेव} ।
\]

\[ ब्रह्म ॥ ११८॥४॥७॥
\]

i.e., which of the two [the heaven and the earth] is the first, and which the later; how the two were born. O ye seers! who knows it? All this universe is held fast by the [mutual] support of the spheres, and by the forces of the two. Day and night revolve in the two, as if united by a wheel.

7. Solution—The solution of the above problem is found in a Yajju mantra—

\[ भूतस्य प्रथमस्य: | यजुः ॥३॥४॥
\]

i.e., Of all the worlds [bhumi] is the first born.

This meaning of the above mantra is given in the Brähmana:—
i.e., This *Prithivi* is the first of the worlds.

This fact is found in an earlier context of the same *Brāhmaṇa* also:

इमु [भूमि:] वा एवं लोकानां प्रथमस्बूःध्यत | ६.१५.३.१॥

i.e., This earth, certainly, was created first of these worlds.

8. Western scientists—Some twenty years ago many scientists believed that ‘the Earth was torn from a young Sun.’ This belief does not hold the ground today. Harold C. Urey expresses his opinion in the following words:

"This idea (sinking of iron to the centre of the earth), like the conception of an earth torn out of the sun, and a moon torn out of the earth, almost has the validity of folklore;"¹

So, at a time, when scientists hold different views, and when their efforts to find solutions will go on for centuries over, the vision of the seers is the only right path for all those whose pursuit of life is true knowledge.

9. The Word, again—I have already said that all creation is a result of the Word and along with The Word. Hence the separation of Bhūmi (earth, not in its present form) form Prajāpati was also accompanied with a sacred Word. It is said in this connection:

(क) स मूरिति व्याहरत् | स भूमिमसूजत् | तैः ब्रा । २।१२।४।२॥

i.e., He [the Prajāpati] spoke Bhūḥ. He created Bhūmi.

(ख) प्रजापतियदः प्रवाहरत् स मूरित्येव व्याहरत् | स इमाम् प्रथमसूजत् | जैः ब्रा । १।२।१॥

i.e., Prajāpati spoke that in the beginning, He spoke this Bhūḥ only. He created this earth.

I do not wish to multiply such passages. These will suffice for the present.

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¹ The Planet Earth, 12. Article by H. C. Urey
10. Hesiod the Greek repeats—Like other branches of knowledge, the Greeks borrowed this knowledge also from the Egyptians or the Aryans, or from both. Hesiod says:

"Chaos first came into existence; Then arose "the broad-bosomed Earth, the firm abode of all things". The Earth produced the starry Heaven." (Thog. 116ff.)

11. Word and its original meaning inseparable—Aryan scientists and philosophers have held that the connection of a word with its meaning is eternal. This doctrine alone solves the riddle of the origin of language. Its exposition should be studied in my "Bhāṣā Kā Itihāsa", or the History of language. Here I have to draw the attention of my reader to the fact, that in Sanskrit the verb bhūḥ means 'to come into existence' and the noun bhūḥ means the 'earth'. So when bhūmi or the earth came into existence, the word bhūḥ had the sound and the meaning in it in an inseparable manner. This secret of language is discussed at length by Bhartri Hari, Vyādi and others. It should be studied in those works.

12. Heraclitus—The Greek philosopher Heraclitus (503 B.C. ?) has preserved this ancient truth in the following way:

"Heraclitus held -that words exist naturally......He said, to use any words except those supplied by nature for each thing, was not to speak, but only to make a noise".

I beg to be excused for this digression, which, I think, was quite essential.

13. Uttānapat—Having lifted foot. In a hymn concerning Aditi, there is a mantra:

भूजं उत्तानपदो भुव भ्राशा भ्रजायत् | ्ष्ट १०१२१४॥

i.e., the earth or the sacred word Bhūḥ was born of the lifted foot, and the directions or the middle region were born of the sacred word Bhuvah.

1. L. S. L. Vol. II, p. 334,
The real significance of a lifted foot or this special posture of Prajāpati is not yet fully clear to me.

14. Bhūmi from the two feet—Prajāpati when depicted as a Puruṣa (=Man) must have a portion of his body which served as the feet. He is sahasrapāt, i.e., having many feet. These were the feet from which was born the earth. So it is said:—

पद्मांभूमिः। ऋ। १०११४११४१।

i.e., The earth was born from his two feet.

Another Rigveda mantra says: He, the great Architect, the one lord, blows out the heaven by his two arms and the earth by his feet.

Note—This blowing out is the same as the separation of the earth from its parent body, by means of Vāyu or wind as related in Vāyu purāṇa, quoted above on p. 113.

15. A Natural Result—We know that Prithivi and Āpah paramāṇus, possessing gravity or weight, had settled in the lower part of Prajāpati. The upper part of the Puruṣa had Vāyu and Agniḥ paramāṇus in abundance. Therefore Bhūmi, which had some weight, was the first to separate from its parent, the Puruṣa.

16. Earliest phase of the Earth—The lower part of Puruṣa or the seed of the universe¹ separated from the upper one and was named bhūmi. It was not pushed far away from its parent, the Puruṣa. The force of Vāyu did separate it, but was only such as to send it a little below the main body. This state is clearly depicted in the first mantra of the well-known Puruṣa hymn of the Rigveda:—

स भूमिः। सबंतो वृद्धा प्रायतिष्ठिद दशाहिगुल्लम्। ऋ। १०१६०१।

i.e., He having pervaded bhūmi (=primordial Earth) on all sides, stood above it at a distance of ten fingers.

¹ अच्छुबीज। नरसिंह पुराण। ६२। ६१।
Note.—In place of the reading vritis of the Rigveda, the Yajurveda (XXXI.1) has spritvā. Halāyudha, the Bengal writer, reads pritvā in his Brāhmaṇa sarvasva. I have already said on p.69, note 1, that the letters pa and va often interchange in many words in Sanskrit. The idea expressed by the word ‘pervade’ requires scrutiny. It may indicate some sort of attraction, which Prajāpati commands over Prithivī for some time. However, I am not able so far to grasp the depth of that condition.

17. The lower cup of the golden egg, containing the earth was almost watery at that time. The Āpah had attained the property of flowing.

18. Earth, a span in size—After the stage of bhūmi was the stage of Prithivī. And she was also at first not in the form of the present Earth. It was not more than the size of a span. It is said ;—

इयत्यप्र भ्रासीतु । इति । यजुः ३४।३॥

i.e., Only this much, in the beginning it was.

And it is finely explained in the Brāhmaṇa ;—

इयति हु वा इयमप्र पृथिव्यास प्रादेशमथी । शो शा १४।१॥२।१॥

i.e., Only thus large was she in the beginning; for, indeed only so large was this earth in the beginning, of the size of a span.

19. This very picture is drawn in another Yaju text ;—

एतावती वा इयं पृथिव्यासीतु । यावत्युत्तवेदि:। काठक सं २४।६॥

i.e., Only thus large was this earth, as the northern altar.

20. A third standard of measurement is used in another text ;—

यावहु वराहस्य चपालं तावतीयमप्र भ्रासीतु । मै० सं ३१।६॥

i.e., As big as the snout of a boar, so big was this earth in the beginning.
21. And this is further clarified in the following passage.

\textit{ग्रापो वा हृद्मांसत् सलिलमेव। स प्रजापतिवर्षरो मूत्वा-उपन्य-}
\textit{महजूत। तत्स्य यावन्युमायातीत तावती मृदम उदहरत। अयमभवत्।}
\textit{काठकसंद्र \textit{पार्थ}। कपिष्ठल संद्र \textit{पशु}।}

i.e., \textit{Apaḥ} were, certainly, such, as had everything dissolved in them. \textit{Prajāpati} assuming the shape of a boar dived near (only a small distance below). As big as his snout was, so much clay it brought out. That became this earth.

\textbf{Note—}The small piece of earth was not at a great depth. It was near the surface of water. The whole process of how \textit{Prajāpati} worked, requires further explanation.

22. Earth extended—All the above four passages indicate that the earth in the beginning was not more than the size of a span. How it grew in size is related below :

\textit{ग्रापो वा ब्रह्म। तच्छ यदवं तर ग्रासीतत्त समहुन्यत। सा}
\textit{पूतिक्षुमाबंि।} \textit{वृषो उपस। १२१२। शो ब्राह्म। १०१६।०।१२।}

i.e., \textit{Apaḥ}, certainly, were [allied with] specially arranged \textit{Agnīḥ paramāṇus}; that, what was the \textit{saraḥ} of the \textit{Āpas}, solidified. That became the earth.

\textbf{Note—}\textit{Arkaḥ} and \textit{saraḥ} are greatly interrelated. The process of their interaction is to be known. That \textit{Arkaḥ} is some sort of \textit{Agnīḥ} is quite certain.\textsuperscript{2} \textit{Saraḥ} is often termed as \textit{avakā},\textsuperscript{3} i.e., some sudden fungus like growth. It may be cream-like foam.

\textit{इन्द्रो \textit{वृत्ताय वज्र \ प्राहरत्। तत्स्य यत्त \ प्रासीर्यत \ सरोभवत्।}
काठक सं \textit{पार्थ}। २३। ४।}

i.e., The broken thunderbolt of Indra became \textit{saraḥ}.

23. \textbf{Foam—}This inference is supported by the following passage :

\begin{itemize}
\item \textsuperscript{1} This passage is quoted by Sayana on \textit{Rig}, I,42. 1.
\item \textsuperscript{2} \textit{ब्रह्मप्रथान \ जुहोति। ब्रह्म \ वा \ प्रसि। काठकसंद्र \textit{पार्थ}। २१।६।०।}
\item \textsuperscript{3} \textit{वृषो संद्र \ वी। वी। वी। ३।२।}
\end{itemize}
PRAJAPATI PROcreates

सो अकाम्यत। ब्राह्मो उद्वंद्वीमां प्रजन्ययनित। ता संकिलेया गुणु प्राप्त्वित। हस्य व: पराभ, रसो व्यक्तत: स कूमोऽव्यक्त। 
ब्राह्मणो अवृष्टीमु दुष्क्षयत-इदं तत:। यदिदमस उद्वंद्वमु उद्वंद्वोऽधिज्या ते सर्व। स वध: एव ब्राह्मणेतृतु। तथौऽवृष्टीमु समहस्ययतात्या। एव। ॥ \(12\)। सोसकामो यत। सूयस एव स्यालु। प्रायायेते। सो अकाम्यत। 
स तपो अन्यत। स अशान्तेपानः। फेनसृजत। सो यवेद। ब्राह्मणा एवीः। 
सूयाः वै सम्भवत। ब्राह्मण्यपेतित। स अशान्तेपानो मूर्दं। 
 builders ... 
Pravat.

I.e., He (Prajāpati) desired, 'from these Āpah (waters) 
may I generate this (earth) !' with full effort, he, well 
perched it in the waters. The juice which flowed away from it became 
a tortoise (=hard skinned); and that which was turned up 
wards (became) what is produced above here over the waters 
(i.e., fungus like growth or foam). This whole (earth) 
dissolved itself all over the water. This all appeared as one form 
only, namely, water.

He desired, 'May it become more than one, may it repro 
duce itself!' He toiled and practised penance; he worn out with 
toil and penance, created foam. He was aware that 'this 
indeed looks different, it is becoming more (than one); I must 
toil, indeed!' worn out with toil and penance, he created 
clay.

24. This long passage, in spite of our ignorance of the 
ancient technique, is somewhat clear. I will try to make it 
clearer still, with the help of another passage of the same 
Brahmaṇa :-

ता हैता ब्राह्म एवेक विभ्र:। तद्या ब्राह्मणां एकं हृपं समहस्ययत 
ता एत:। तदवैतृपपं करोति ॥ \(2\)। ब्राह्मणसं समहस्ययतः। 
वध: तदवैतृपपं करोति। ब्राह्मणसं समहस्ययतः। 

ta haita brahma eva vr: | tad ya brahmaṇaṇa ekahṛpaṃ samahsyaṃ 
| tā etat: | tadavaitṛpapam karoṭi | 2 | brahmaṇaṃ saṃ samahsyaṃ 
| vadh ya traṇaḥ hiṁsāṃ ṛṣipm saṃsukṣyataṃ | tadavaitṛpapam karoṭi 
| brahmaṇaṃ saṃ samahsyaṃ 
| 2 | 
| 9 1 9 11 |
i.e., Hence, verily, these waters are [represented in these] three *mantras*. Then, those waters which appeared as one form, these are here [in the sacrifice]; that form he now makes it.

He then produces foam and puts it thereto: the second form which was created [in the shape of] foam, that form he thus makes it. And the clay he now mixes is that very clay which was created as the third form.

Note—Therefore *saraḥ* and foam are somewhat identical, or have a very subtle distinction.

25. Still further Explanation—*Agniḥ*, air and water are the three causes which carry the solidification of the earth. This will be known from the following passage:—

(क) भापो वा इदमासन् सलिमेव। स प्रजापति: पुष्करणेन वातो भूतो उलेलियत (अलेलायत—तैः सः।) स प्रतिष्ठाना नाविन्दत। स एतमेव कुलायमपवत्। स एतं प्रजापतिरपि मध्ये अनिर्मितयु। सेयमभवत्। ततः: प्रतिष्ठात्। इयं वावर्गः। काठकसः। २२।१६॥

i.e., *Āpah* (waters), certainly, were such in which everything was dissolved. He, *Prajāpati*, assuming an air-like form moved to-and-fro on a lotus leaf. He did not find a resting place. He saw this net or nest of waters. He arranged this *Agni* in the midst of water. It became this earth. Then he took its seat. This earth is *Agniḥ*.

Note—'Assuming a form.' This expression is very common in Vedic *Samhitās* and *Brāhmaṇas*. Its secret should be unravelled. *Puṣkaraparṇa* or a lotus-leaf is the source of *Agniḥ*. The earth is also called a lotus-leaf. The action of the arrangement of *Agniḥ* should be noted. It is certain, that some form of *Agniḥ* was the cause of the solidification of the earth.
(क) प्रापो वा इवमः सलिलमा सैदृशी| स एवं प्रजापतिः प्रथय मृ 
चित्मृ प्रवशयत्। तामुगाधत्। तद्व इवमभवत्। तैर सं। ५। १। ५। २| 

i.e., *Apah* (waters), certainly, were such in which everything was dissolved in the beginning. He *Prajāpati* saw this first layer of the arrangement [of *Agni*]. He deposited this layer. That became this earth.

The help of *Agni* is again vividly expressed by a metaphor in the following way:—

(ग) प्रापो वहस्वश्च पत्नी भ्रासन। ता भ्रूः भ्रमरम्यच्यायत्। ता: 
समभवत्। तस्य रेति: पराधपत्। तद्व इवमः भ्रमभवत्। |

तैर सं। ५। १। ५। २। 

i.e., Waters were the wives of *Varuṇa* (= a form of *Agni*). *Agni* set his heart upon them. They were ready for union. His semen fell. That became this earth.

Note—The semen of *Agni* can be traced; but my subject proper is going far away, so I leave it for the present. This is clear that the seers regard *Agni* as a definite cause in the formation of earth. The state of semen and that of the egg have a close relation.

26. Unsteady or loose and moist Earth—The earth was growing in size, but was very moist. It was loose also. Its that state is described in the *Brāhmaṇa* in the context of the Establishment of the sacred fires:—

प्रथ शक्रीया: सम्भरति। देवाण्व वा भ्रुपुराण्वोभये भ्रजापत्या: 
पश्चीविरः। सा हैं पुष्पिवी-प्रलेलायद्—यथा पुष्करपरावेवमेव। तां हु 
स्म वात: सवहृति। २ सोपेत् देवानू जगाम। उपासुरानू। स यद्व देवानू 
उपासुरानू। २५। तदौ! तदौ। हस्तमो प्रतिष्ठां दोहामहि। तस्या भ्रु 
ब्राह्मणः भ्रमिष्टिगीयमृ भ्रजनी भ्राद्वामहि। ततो अयं सत्त्वानू निर्मेक्याम। 

1 यो वा भ्रेण: स वस्त्र। ऐरो ग्राह ५। २६। २। 
2 तैर दिशोऽजुतात: समभवत्। तैर ग्राह १। १। १। १।
i.e., He (the sacrificer) then collects pebbles. Now the gods and the Asuras, both of them sprung from Prajāpati (or the golden egg) once contended for superiority. The earth was then moving to-and-fro like a lotus leaf; for the wind was tossing it hither and thither: now the earth came near the gods, now it came near the Asuras. When the earth came near the gods; they said, 'come, let us steady or make firm this resting place; and when it is firm and unloose, let us set up the two fires on it; where upon we will exclude our opponents from any share in it.

Accordingly, in like manner as one would stretch a skin by means of wooden pins, they (the gods) fastened down this resting-place by means of the pebbles.

27. Earth fastened towards the North pole—This unsteady position of the earth remained for some time. It appears that the physical forces termed as gods were on the northern pole and the Asuras on the south. The wind blowing from the quarters tossed the earth once towards the north pole and again towards the south. Finally it became steady when it was in the north pole. We know that the south pole of our earth abounds with deep oceans.

The loose earth became firm by means of the pebbles, which slowly and slowly were formed in the loose earth. This process is described in the following passage;—

(क) शिविर वा इयमप्र प्रासित। तां प्रजापति: शंकरारिमिर- हंस। ?????? न्वो ब्राह्मण ब्रह्म प्राहृत। तत्स्य या विद्युः प्रासनः। ताः: शंकराः प्रभवन्त। मेघ लो २१।११।

i.e., Loose was, certainly, this earth in the beginning. Prajāpati made it firm by means of the pebbles.......God
Indra, certainly, threw his thunderbolt on *Vritra*. The drops of water which fell from *Vritra*, those [mixing with the loose earth] became the pebbles.

28. *Vritra*—Occidental translators of Vedic texts have never tried to understand the physical basis of *Vritra*. Its existence was in that hoary past when the earth was yet in its formation. There was no habitation on this earth. Hence to try to find historical references in such Vedic texts is to live in a dreamy land.

(ग) अलेलेद वा इय पृष्टवी। सा-प्रबिबेद अनिसर्म भ्रमि चकय-तीत। प्रबिबेद अनि: दर्िैं मे बिनेदक्षतीत। भ्रार्य: हीयमासीतः।
तां देशः: शकरार्मः: प्रहर्वतः। तेजो अनावद्धः। जन्नकरारः भवति।
इममेव हृतः। तेजो अनौ दयातः। कपिः सौ ६१५।। काठक
सौ ५१२।।

i.e., The earth was, certainly, moving to and fro. She feared *Agniḥ* will burn her too much. *Agniḥ* [on the other hand] feared, [the earth] would spoil her grip or flame. It was just like a moist thing then. The gods made firm that earth with pebbles. They placed lustre in *Agniḥ*. These are the pebbles. [By this process] they make it firm. He [the sacrificer] places lustre in *Agniḥ*.

29. *Agniḥ* and *Prithivi*—From the forecited passages it is clear that the seers regarded *Agniḥ* as a major source of the steadiness of this earth. *Agniḥ* assumed various forms. I do not know how it happened, but there are glimpses in Vedic literature to lead to this assumption. *Prajāpati* also remained a controller of many processes till very late.

30. How foam became clay—Foam turned into clay under the influence of some sort of pressure. This is expressed as follows:—

ख (फेम:) यदोपहन्यले मुदेव भवति। या न रात्रि ६।११।११।
i.e., And when that foam is beaten or pressed, it certainly becomes clay.

This clay formed the earth as has already been said above.

31. Foam on hot water only— It is noted in a Brāhmaṇa that foam appears only on hot waters :

तत्र शष्यति। ताः केनमसूजति। शव ब्राह ६।१।१३।१३।

i.e., those (waters) underwent penance or became hot, they gave birth to foam.

And again it is said :

तत्रमाद जयाद तप्तानां फेनो जायते। शव ब्राह ६।१।१३।१३।

i.e., Hence, when waters are hot, foam is produced.

32. Peculiarity of foam:... It is said about foam :

न वा एष्य यूधाको नाद्र। तैते ब्राह १।१६।१६।२७।

i.e., it is neither dry nor moist.

All the above information I have collected from the Vedic texts; now some evidence from the Mahābhārata....

33. Mahābhārata evidence,... Below are given three verses which throw light on the phenomenon of the solidification of earth :

श्राकाशादभवद्वारिसूलिलादनिमाती।
श्रविनिनिकस्योगातित: समभवम्मही। शास्तिः१५।०।१६।१।

i.e., from Ākāśa was produced water; and Agni and air from water. From a union of Agni and air, then, came into existence the earth.

These truths were so commonly known in those days that the author has presupposed many things in the above statement. It is further stated in a clearer way :—
i.e., *Agni* united with air throws down water from the atmosphere, that on account of its union with *Agni* and air assumes compactness or solidity.

And the other thing, called oily matter, which falls from the atmosphere (during rains), along with *Agni*, air and water assuming compactness attains the form of earth.

Here ends this chapter; the next will be about the birth of the heavenly region.
CHAPTER XI

BIRTH OF ANTARIKSHA—MIDDLE REGION

1. The Antarikṣa is also called the Bhūvar or the Ritadhāmā region. It is not only a space between the earth and heavenly bodies, but it has many specialities of its own. These will be understood in the course of this chapter.

2. Its birth is described in the following way:

सो शक्मयत प्रजापति: | भूय एव स्यात प्रजापति इति | सोक्तरीचा पूषिकी मिधुन सम्बन्धतः | तत: प्राण्वं समवर्तं | तद्यम्य्यु मृत्त: | पुष्यतु इति पुष्यतु | भूयोक्षु | इत्येव तद्यम्य्यु | ॥१११॥ स यो गर्भोज्ज्वलासीतः स वायुरमस्तः | प्रथ यदशु संकारितमासीत् तानि व्राणसि-प्रचवन् | प्रथ यशः कपाले रसो लिप्त भ्रासीत् ता मरीचयोक्षभवन् | प्रथ यत्र कपालमासीत्त तद्यम्य्यु सम्बन्धवन् ॥१२॥ श्री क्री. ६११२॥

i.e., He, the Prajāpati desired, “may it be again (after the earth another production) may it be reproduced!” By means of Agni he entered into union with the earth: thence an egg (or, a son of the golden egg) was born. He touched it: ‘May it grow in strength. Again, ‘Let it be!’ this very word he spoke.

And the embryo which was inside was born as Vāyu, and the tear which dropped became those birds [of the atmosphere; not those of the earth.] And the juice which was adhering to the shell became those rays of the atmosphere; and that which was the shell became the middle region.

3. Note—There are many items in this passage which require clarification. This will be done later on. Here I have to point out that J.Eggeling (1894 A.D.) translates the word

1 Jaimini Br. III. 347.
"marīcayaḥ" as "sun-motes." This is not correct. The sun was not born till then. These are those rays, which are known as "cosmic rays" in modern physics.

4. The following points should be considered in regard to the above quotation. It says:

(a) *Agni* and *prithivi* (earth) came into union. How this union took place is to be known?

(b) The egg contained an embryo.

(c) Birth of *Vāyu*; what is this air; what is its difference from the seed-air, as well as from the air which brought about the birth of earth. These are questions which should be satisfactorily replied by a further study of Vedic literature.

(d) What are those birds of the atmosphere? These are the particles of dust etc., which remain flying in the atmosphere.

5. Navel of Purusha—The birth of the middle region was from the navel or the middle portion of the golden egg. This portion gave rise to a separate shell and that created this region. So it is said:

नाभ्या: भ्रासीब्र भ्रस्तरिक्षम| च्

i.e., from the navel of the *Puruṣa* was produced the middle region.

6. Middle region, Extremely small—I have said in the previous chapter that the earth at first was just the size of a span. It was extremely small. So also the middle region was extremely small. This fact should be carefully noted. In a subsequent chapter it will be shown that this region grew in size slowly and slowly. Its original form is hinted in the following passage:

तप् याबति क्रुरस्य धारा याब्रह्म मक्षिकाया: परं ताबानन्तरेष्याकाशः।

बृहं उपो १२।२॥
i.e., As much breadth as of the edge of a blade, or as thick as the wing of a fly, of that much distance is the space [between heaven and earth.]

7. Skanda svāmi informs—Skanda svāmi (650 A.D.), a commentator of the Rigveda, writes:—

याविदं भक्तिकार्यं पत्नं तावत् दावपुष्पिः स्थलस्तरं हत्युपनविभवः
पौराणिकान्तंद्राचक्षते । श्रो १२।१४॥

i.e., As is the thickness of the wing of a fly, so much was the space between heaven and earth. This is said by the authors of the Upaniṣads and the writers of the purāṇas.

8. Space, occupied by the middle region...The original space which was extremely thin was occupied by the middle region. It is said:—

सह हैवमायग्रे लोकावासतः । तमोविवर्तोत्तरेषाकाश भ्रातीत्
तद्वस्तरिक्षःभवतः । ईशा हैतन्नाम । श्रो श्री ७।१२।१३॥

i.e., In the beginning these two worlds (heaven and earth) were, certainly, together; and when they were parting, the space which was between them became the visible middle region. It was certainly, of the name īkṣa (the region which can be seen).

Note—I think the probable meaning of the word īkṣam is which becomes visible. And thus one thing which is certain, is that space and the middle region are two different things. The middle region is full of many things. One of these are the Maruts, the source of magnetic fields, and their lord Indra, whose body is composed of electric particles surrounded by Vāyu.

9. Necessity of the middle region—At first the heaven and earth were almost together. It will be shown later on that the heaven could be touched from the earth. Had that state continued, the existence of day and night, the working of the seasons etc. were all impossible. In that condition, man would
never have been born on this earth. But the universe is working under an eternal law. Therefore the production of the middle world was quite necessary. With its appearance the stars, planets, sun and moon began functioning with a purpose. The very conception of the two worlds became possible.

Hence it is said:

ग्रहं वै लोको मध्यमो वामदेवयान्। एतस्मात्त्वा इमो लोको
विहवज्ञो-श्रसुच्येताम् ।। तात ॥ श्रादे ॥ ॥

'The Vāmadevya, forsooth, is the middle world, out of it these two worlds, the heaven and earth were created apart' (spread on both its sides).

So the middle world, though small, came into existence. Its full description will follow in a succeeding chapter.
CHAPTER XII

BIRTH OF THE SUN

1. Different names—Aditya, sūrya, savitā etc. are the main names which are used for the sun. These indicate different states of it. Besides these, there are many other names which are found in Vedic texts. Those are not needed for the present topic.

2. The Brāhmaṇa works describe the birth of the sun in their own typical way. It was after the birth of the earth and the middle world. Some of the concerned passages are given below:

(k) सोकानयत। भूय एव स्यात् प्रजायेति। स वायु अन्तरिक्ष भूयं समभवत्। तत्र ग्राण्ड समवर्तत। तद् भ्रम्यमृत्तद् यशो बुद्धतीति। ततो यस्मादिन्द्वो ज्ञात। एष वै यथा। यद्यु संक्षरिता मानित सो शक्ता प्रविष्टवर्त्त। यद्युवं वै तमस्मा इत्याच्छक्ते।

......भर यः कपाले रसो लिप्त ग्राण्डै से रहस्यो अभवन्। भर यत् कपालनासौर सा वौर्धवल। वा ६८। ६८१२२३।

i.e., He (Prajāpati) desired, ‘May it once more be, may it reproduce itself!’ By means of Vāyu he entered into union with the middle region: thence an egg (or, the son of the golden egg) was born. He touched it, (saying) ‘Bear thou glory!’ then yonder sun was created, for he indeed is glorious. And the tear which flowed from it become that variegated stone-like hard thing. It is indeed the tear (Aśru) which they mystically call ‘stone like hard thing.’... ...And that which was the upper part of the shell became the heaven.

Note—Aśmā prīšni or a stone like hard thing. It is this thing in the sun which is a cause of all colour in the universe,
3. The *Tāṇḍya Brāhmaṇa* describes the whole process in a different manner:

\[
\text{𝗯𝗵ूत स्यां प्रजावेयति। सोश्रोचत्।}

tathya śoṣchata prāvidhyo mūchnaḥ suṣuvat।
syā śyā mugdhnāvahum।
s dronakalasha abhavat।
tartamun deva: śukmālāhūt।
taṁ vā s prāyaṇa-pratipate-pratvajjīvatu।
tapadvam brā ७५।९२।११।
\]

i.e., *Prajāpati* desired: ‘may I be more (than one), may I be reproduced.’ He began to shine. While he was shining, then, out of the head of him, the sun was created. This (sun) slew off his head; that became the *dronakalasha*. Therein the gods took their *sukra* (= a form of *Agniḥ*) or the shining immortal juice. On that account, certainly, he (*Prajāpati*) oversurvived his that pain (caused by the separation of the head).

Note—*Aṣocat*—Caland translates it as “languished”. This is a result of sophisticated philology. Here in this context, it means, ‘began to shine or shone’. The head part of *Prajāpati*, as already remarked, contained an abundance of *Agniḥ paramāṇus* and molecules. The sun is a creation from those *paramāṇus*.

*Dronakalasha*—This object plays a special role in the phenomenon of the sun and the heavenly region. It is here that the gods or the physical powers are again and again charged with electricity. Herein is found the immortal food of the gods.

A third account is preserved in another *Brāhmaṇa*. It is as follows:

\[
\text{ग) भास्तयोज्ज्वलत। तास्तपत्तिबाग गर्भमुद्धत। तत् एव}

\[
\text{भ्राविद्यो ज्ञायत शष्टे मासि। कोपी। ब्राह्मण २५।१२।}
\]

i.e., The *Āpas* underwent penance. Having performed penance they held an embryo. From that the sun was born in the sixth month,
Note—The purpose of this is almost the same as of the previous observations. The mystical description is slightly different. ‘Sixth month’ should be carefully studied.

(७) Rigveda says:—

चक्षो: सूयों जायत। ऋ० १०१६०१९१॥

i.e., From the eye [of Puruṣa or Prajāpati] the sun was born.

This is almost the same as the birth of the sun from the head of Prajāpati.

(९) The Taittirīya sanhitā records still another phase of this birth:—

रक्षित:—हस्येव-प्राणेत्वम् प्रसूजत। तै० स० ५१३६॥

i.e., He spoke ‘raśmiḥ’ or the ‘ray’, and produced the sun.

(७) Mahidāsa Altareya expresses it in another way:—

तस्य [प्रजापते:] यद्व रेतसः प्रथममुददीयत तदसावादित्योऽभवत्।

ऐ० बा० ११४॥

i.e., From the semen of Prajāpati, what became shining at first, that became the yonder sun.

(९) The Veda states:—

यज्ञार्थवा प्रथम: पश्चाते तत्: सूयों ज्यया वेन प्राजनि।

ऋ० १५५१५॥

i.e., By certain combinations Atharvā Agniḥ paved the way. Then was born the shining sun, the protector of the vows or laws.
CHAPTER XIII

BIRTH OF THE MOON AND OTHER HEAVENLY BODIES

1. And now the birth of the other heavenly bodies. It was the fourth stage in the creation of our solar system. With it the existence of moon and other bodies appears. It is said:—

सो ज्ञामयत्। भूम एव स्यात्। प्रजावेतेति। स भ्रादिप्येन दिव्मियुन्न सम्बवत्। तत् भ्राण्डं समवर्तत॥ तद् प्रस्मृतात। रेती प्रृत्तीति। तत्तत्वचन्द्रमा उपर्युत। एष वै रेतः। प्रथम वद्वृं संक्षरित-मासीत्, तानि नक्षत्राण्यभवन्। यथा य कपाले रसो लिप्त भ्रातीत् ता भवान्तसदिशो समवन्। यथा यत् कपालमासीत् ता बिशो भवन्।

१। ६११२१॥

i.e., He [Prajāpati] desired, ‘May it once more be, may it reproduce itself!’ By means of the sun he entered into union with the heavenly region: thence an egg was born. He touched it, saying, ‘Bear thou seed!’ From it the moon was created, for the moon is the seed. And the tear which flowed out became those naksatras (=stars). And the juice which was adhering to the shell became those intermediate quarters; and that which was the shell became those main quarters (points of the compass).

2. The above makes it clear that the moon is a production from the sun. It is very clearly stated in a purāṇa also:—

आश्चर्यचन्द्रिण्या: सव विद्येया: सूर्यसंभवः। वायु पुरो ५०१६॥

५। २५॥

i.e., Stars, moon and the planets, all these should be known as born of the sun.

3. Rigveda says:—
The moon was born from the mind [of Prajāpati or Puruṣa].

It should not be supposed that it was a human mind. I have already pointed out on p. 3 that mind etc. are not known in western psychology.

4. The Jaimini Aranyaka says:—

इष्य यत्नम् प्राणीः स चन्द्रमा प्रभवत्। जै० उ० २१२१॥

i.e., And that which was mind, that became the moon.

What was the mind of Prajāpati, what was its composition, and how it worked, are all questions, which require a separate study. I leave these for the present.

Soma and Vritra

5. Soma, Vritra and moon are closely related. Soma is also related to Ṛgveda: but I am yet unable to say about its exact composition. One thing is certain that Soma is in the highest heaven. It is said:—

दिविभ्रमो सभित्रित:। जै० उ० १०१५॥

i.e., Soma is in the heaven.

Its place during the early period of creation is also pointed out:—

तृतीयस्यामिति दिवि सोम भार्तू। तं गावश्याहरत॥

jै० बृहो ११३१॥

i.e., From here in the third heaven was Soma. It was brought down by the Gāyatrī metre.

Note—it should be remembered that metres create definite waves and work in various forms in nature.

6. Vritra—Vritra is the big primordial cloud which enveloped the heaven and earth, when both of them were quite close to each other. Its upper part or head which was in the heaven contained Soma,
Soma and Vritra both contributed their parts to the formation of the moon. Moon is called:—

चन्द्रमा सौभ्यः | शा ब्राह्मण्य ११६१३१२४
i.e., Moon is related to Soma.

And this fact is often repeated. As regards Vritra it is said:—

इन्द्रः तः (वृत्तः) देवा अभ्यंभितस्य सौभ्यं र्यक्षमास तं चन्द्रमां संकारः | शा ब्राह्मण्य ११६१३१३०
i.e., Indra cut Vritra in twain, and from that (part) of his which was related to Soma, he made the moon. Again it is said:—

अर्थ एवं एवं बुद्धि च चन्द्रमा: | शा ब्राह्मण्य ११६४१३३
i.e., Vritra, assuredly, is no other than the moon.

7. Black in the moon

The moon is born of the sun; and still there is a black spot in it. It is a part of this earth. When the heaven and earth were almost together this black part was thrown from the earth into the moon. It is said:—

देवा हि वं संग्रामं सन्तिकाश्चत: | के होचुः | हल्ल यदवस्वे पृथिव्या प्राकमुक्तं देववजनः तत्तु चन्द्रमस्य निद्धारमेन | तदेवेत्तैं चन्द्रमस्य ह्राणाम् | शा ब्राह्मण्य ११२१४१७६
i.e., The gods, surely, were preparing for the contest. They said to one another: ‘Come let us remove to the moon what imperishable place of worship there is on this earth: that is the black (part) in the moon.

8. Chāndogya Brāhmaṇa—It repeats this truth:

यतू पृथिव्या प्राकमुक्तं दिव्य च चन्द्रमस्य ध्रुतम् | चान्दोऽय ब्राह्मण्य ११३४१३१
i.e., what is imperishable of the earth that is placed in the moon in the heaven.
9. Pāraskara—This teacher says:

बैदे ते भूमि हृदयं दिवि जन्मसति स्थितम् | गृह्न ११६ १७||

i.e., O ye earth! I know your heart; it is placed (or connected) in the moon in the heaven.

This appears to be a general belief of the ancient teachers that though the moon is a production of the sun, yet, its black portion is a part of this earth.

10. Two kinds of Nakṣatras—Stars

10. One kind is that which is born along with the moon, and the other is that which is born from the pores of Prājāpati. The first kind is already referred to above. The stars under the first kind number twentyseven and the substars attached to them are also of the same number.

11. These are the Nakṣatras proper. The other appear to be stars in general. It is said about them:

प्रजापति बै ध्रजा सृजनाम् । पाप्मा मृत्युर्भिमिरिज्ञघान् ।
स तपोस्तयत सहस्र संबत्सरान् पाप्मानं विजिहासन् ॥१॥
तस्य तपत्तेपानस् । एम्यो लोमगतेम्: ऊर्ध्वानि ज्योतीध्वाणोऽधीकानि
तानि ज्योतिः-एतानि तानि नक्सत्राणि । याबन्तेतानि नक्सत्राणि
ताबन्तो लोमगति: । याबन्तो लोमगति: ताबन्त: सहस्रसंबंधसरस्य
मुखा: ॥२॥

i.e., When Prājāpati was creating his subjects, death, that evil, overpowered him. He practised penance for a thousand years, striving to leave evil behind him.

Whilst he was practising penance, *lights* went upwards from these pores of his (from which the hairs spring); and those *lights* are those stars: as many stars as there are, so many hair-pores there are; and as many hair-pores as there are, so many *muhūrtas* there are of a thousand years.

Note—According to the Brāhmaṇa text (XII. 3,2,5) there are 10,800 *muhūrtas* in an year. Hence in a thousand years
the number of múhúrtas is 1,08,00,000. This is the number of stars in our solar system and possibly this may be the number of hair-pores in a healthy man also.

Western estimate—The Dutch astronomer Kapteyn estimated the total number of stars in our galactic system to be about 40 billions.¹

Satapatha Brāhmaṇa talks about the number of nakṣatras. In Sanskrit the nakṣatras and tārās are two different things. The decipherment of their difference requires further study.

¹ G. Gamow, The Birth And Death of the Sun, p. 183. One Two Three—Infinity, 1953, p. 266.
Chapter XIV

PROXIMITY OF HEAVEN AND EARTH

1. The story of the birth of the earth, of the middle region and of the sun has been related in the previous chapters. It has also been noted in article 8 of chapter XI that in the beginning the earth and heaven were almost together. Distance between them was of a space which was extremely thin like the edge of a blade.

2. This is a truth of great importance. It is a touchstone of the divine insight of the seers, and a gem in the whole range of astronomical thought. Its keen knowledge in an extremely ancient world is a hurdle in the way of the theory of gradual advancement of knowledge, which is based on a few centuries old history of Europe alone.

3. The Rigveda contains a vivid picture of this fascinating state. The following three mantras should be minutely studied.

4. The first of these three mantras is from the hymn of the seer Đirghatamā. Its deity or the main subject is dyāvā-prithivi i.e., heaven and earth:—

(क) ते मायिनो ममिरे सुप्रबेततो जामी सयोनी मिशुना समोकसा।
ख्रूः ११४६१४११

i.e., These two, the heaven and earth, endowed with a wonderful phenomenon as well as an excellent discerning power, and fully conscious are like related ones [on account of] a common birthplace [in the Hiranyagarbha] and are paired on account of a common residence, showed their uncommon wisdom in their actions.
Note—The richness of Vedic phraseology, indicated in this mantra, is apparent at a glance to a student of Vedic science, who is well versed in the basic theme of his subject. It is this catching diction, about which the philosopher Kumārila (earlier than 4th cent. A.D.) remarked that the experts of Vedic knowledge alone know the fine distinction of words not found in human compositions. He names it as chāndasī mudrā, i.e., a special posture of Veda. And now the words of the mantra which require a little exposition:

(a) Māyinah—endowed with a wonderful phenomenon, and an excellent discerning power. A law or an order is at the basis of that phenomenon, and that is its discerning power. Māyā is phenomenon or prajñā, i.e., wisdom or discerning power. Māyayā (Rig. I. 160, 3) translated as ‘mysterious power’, by A.A. Macdonell in his Vedic Reader, is not a correct rendering. Vedic lexicon, Nighaṇṭu (3200 B.C.) is the only true guide here, which he helplessly tried to discard.

(b) Supracetasah—fully conscious. Every action of theirs is as of a fully conscious mind. Nothing happens to the contrary.

(c) Jāmi—related ones.

(d) Sa-yoni—having a common birthplace. Both heaven and earth have a common birthplace. Their womb is the golden egg.

(e) Mithunā—they are paired. Their actions are inter-related.

(f) Sam-okasā—Of a common residence. The subtle idea is of their proximity.

The learned can find out other truths for themselves. With a noun in the dual number, the verb is in the plural. It is a peculiarity of the Veda.

Study Rig. x. 65.8 also.
5. The second mantra is from a hymn of the seer Agastya and pertains to the same topic:

संगमन्त्रे सुखी समन्ते र्वसारा जामी पिन्नोख्यसे ॥

i.e., [The heaven and earth are] united together, always young (=never slack in their actions), at a parallel distance, like sisters and interrelated, in the vicinity of their parents.

Note—(a) Samgamchamane—united together. At first quite close to each other, and later united under definite laws.

(b) Yuvati—always young. The fuel of the sun, a part of heaven, will not exhaust. Its annihilation is governed by other laws.

(c) Pitroor-upasthe—in the vicinity of their parents. They are Agnih and Apha or Hiranyagarbha=golden egg and Apha.

6. The third mantra is from a hymn of the seer Prajapati, son of Visvamitra (not Prajapati Purusa) and pertaining to the 'all gods'.

समान्या विगुले दूरे प्रवले ध्रुवे पदे तस्यतुजगिले ।
उत स्वसारा युवती महती ग्राहु यवते मितुनानि नाम ॥

i.e., Heaven and earth, performing a similar action, separated from the position of proximity, having their shores very far off, rested in the firm middle region. They are well awake [towards the laws of the universe]. And like sisters, always remaining young, proclaim their twin like names (in the dual number).

Note—Yāṣka, (3100 B.V.) notes in his Nirukta IV. 35 that the word viyute signifies the separation of heaven and earth from a common residence. Roth, Maxmuller and others, who do not know the very a, b, c of Vedic knowledge, have

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1 Cf. G. Gamow: "The sun evidently cannot shine for an eternity and is bound to run out of fuel some time in the future."

Physics, 1963, p. 523.
spoiled the meanings of such words. It will be shown further. 
Yāska writes:—

वियुते व्राहापृथिव्यो | वियवनात् | निष ४१२५।।
i.e., vīyute are heaven and earth, because they separated from a very near position.

The mantras have been explained. Further, there is a word upākayoh in Rig. I. 81, 4. It is explained by the commentator Skanda svāmin as an adjective of heaven and earth, which stood near each other.

7. So, it is sure that in the story of creation the heaven and earth were quite near to each other at one time. The conditions of that time, e.g., the formation and presence of Vritra or the great cloud, the envelopment of the sun by Svarabhānu etc. are described in the Veda and the Brāhmaṇa works.

8. Veda explained in Śākhās and Brāhmaṇas

The truth told in a seed-like form in the Veda is explained at length in the Brāhmaṇas. The following are some of the passages related to this subject:—

1. इमी वै लोको सहस्ताम्। ती व्यैताम् | ऐं ग्रा। ४।२७५।।
i.e., These two worlds were certainly together; they separated.

2. इमे वै सहस्ताम्। तौ सं। ३।२।।। मै। सं। ३।१।।
काठकसं। १३।२।।
i.e., These worlds were, certainly, together.

3. व्राहापृथिवी सहस्ताम्। तौ सं। ५।२।।। तौ ग्रा। ५।१।।
i.e., Heaven and earth were together.

4. सहू स्वेमावप्र लोकावासतु: | ग्रा। ५।१०।।
i.e., Together, certainly, in the beginning these two worlds were.

5. इमी वै लोको सहस्ताम्। ता ग्रा। ७।१।।
i.e., These two worlds, certainly, were together.
6. इमे वि लोकः सहमसन्। ताः ब्रा० ०१४।४।
i.e., These three worlds were, certainly, together

7. इमे वि लोकक सहू सत्तो व्यैताम्। जै० ब्रा० ०१४५।
i.e., These two worlds, certainly, being together separated.

8. इमे वि लोकः सहू सत्तस्वेमिता व्यायन्। जै० ब्रा० ०१७२।
i.e., These worlds, certainly being together, separated in three ways.

9. Brāhmaṇas would not explain various phenomena without going into the earliest position of heaven and earth, and, therefore, they often began their description with that state of the worlds.

All the Brahmavādins—specialists in Veda, from the earliest times accepted this basic truth about the position of heaven and earth in the beginning of creation.

10. Naturally the Sun also near the Earth

The sun, moon, planets and stars are a part and parcel of heaven, and if the heaven was near the earth, the sun was also naturally so. Therefore, the following statements about the position of the sun in that distant past should also be noted:

1. व्रतावलितोयोक्तक्तन् लोक व्रासीत्। तै० स० ७३१७।
i.e., Yonder sun was in this world.

2. इह वा व्रस्स्व व्यासीत्। तमिलोप्तक्तमुः लोकान्तर।
   मै० स० ११५३१७३१७३१६३।
i.e., Here was, certainly, yonder sun. Him, from this world, [the gods] carried up into that world.

3. व्रास्सियो वा प्रत्त० प्रवाहः व्रासी० यवत्त० चास्तालम्।
   प्रबोधिनि। स इहं सर्वं प्रातसन। तत्स्य देवः। प्रवाहाः व्रासीयुः।
   ते अज्जूनू सरीं वा प्रयम् इहं प्राच्याति। बीमां परिह्वरामेति।
   जै० ब्रा० ०१५७।
i.e., The sun was, certainly, here on earth in the beginning; (only at a distance) where this Cātvāla (pit in the north of the
altar, is), and you was Agni. That (sun) heated all this. The
gods feared its burning heat. They said: 'certainly this
sun will burn all this: let us separate these two. [change
their positions]

How Agni entered into the earth will be explained later
on?

4. Jaim. Br. V. 2, has a slightly variant reading. It is
given below:—

एतत्तः ऊँचास्तः उदूर्हणादेति। ते विष्ठितमिःसैविसूच्येन मुदोहुः।

जो ब्राह्मणं ॥२॥

i.e., We press it upwards. They pressed it upwards in six
months.

Note—The sun was pressed upwards by the gods
(=various physical powers). How it happened, will be clear
hereafter. It took a period of six months. What were these
months is not yet clear to me.

5. शम हृ वा प्रसावम् प्राधिविन्यम् ग्रास । ब्रह्मणं व्रह्मणं ।

i.e., Here, certainly, was the sun in the beginning.

11. Proximity explained

I have already said about the distance between the
heaven and the earth. It is very clearly explained in the
following two passages:—

1. शमन भ्रायामहि वीतये, इति तद्वैति भवति बीतय इति।
समन्तिकमिभ हृ वा इमेजः लोक प्रासुः, इति। उम्मृद्धया हैव ब्रह्मणः

शो ब्राह्मणं ॥२॥

i.e., Come Oh Agni! to separate or make them expand.
So it becomes, to make them expand, he says. In the beginning
the three worlds were well-nigh contiguous to one another:
then the heavenly world could, certainly, be touched.

2. Another aspect of that state is depicted by the sage
Kaṭha, who uses a very appropriate simile for it:—

i.e., These two (heaven and earth) were, certainly, together. They touched one another, as two bamboos touch one another, (when drawn near by wind).

12. Validity of the above—The above statements might appear to be unbelievable at first. And there is no doubt that none could have dared to express them, say, about fifty years ago.

13. Macdonell’s bewilderment—The Oxford professor writes about the above in his ‘Vedic Reader’: “Varuna (as well as other gods) is several times said to hold apart heaven and earth, which were supposed to have originally been united.” (p. 136)

I have only to say about the above, that the heaven and earth were not ‘supposed to have originally been united’, but were actually so. This, certainly, is one of the greatest truths which has been expressed by the seers.

14. Modern Findings

Things have changed in recent years. With the march of science during the first half of the present century, the above Vedic statements have become generally accepted truths.

Prof. George Gamow writes:—

(a) “In fact, it is obvious that the moon must have been revolving “almost within touch” of the Earth’s surface immediately after the separation.”

Prof. H. Spencer Jones writes:—

(b) “—various universes were much closer together when the solar system was formed than they are now.”

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1 Biography of the Earth, A Mentor Book, p. 48.
"...the various universes congregated close together in a volume of space much smaller than they now occupy."¹

Another professor writes:—

(c) "Since all these remote galaxies, without exception, are moving away from us and from each other, one must conclude that at some epoch of cosmic time all of them were clustered together in one fiery inchoate mass."²

Thus it is quite clear that the modern scientist has also begun to realize this old truth now.

It should be noted that there is a remarkable coincidence of almost one and the same expression in quotation No. 11, (1) above: “the heavenly world could, certainly, be touched,” and the words of Dr. G. Gamow—“almost within touch,”—although there is a gap of thousands of years between the two. As regards (a), it should be remembered that the theory of the birth of moon from the earth is discarded now. As regards (b), it gives only some idea about the closer position of the universes during the formation of the solar system. As regards (c) it rests on the assumption that all the galaxies are receding from us even now. The seers say that the receding of heaven from the earth in our solar system stopped long ago. Why it stopped, is also stated. This will be shown later on. The coincidence between the words of Sat. Br. and the language of Dr. Gamow is noteworthy; although Dr. Gamow’s theory is discarded now,

So much, then, about the position of the three worlds just after their creation.

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¹ Life on the other Worlds. p. 153.
CHAPTER XV

ONLY ONCE IN A CYCLE

1. In this solar system of ours, why one earth or one sun only is seen today? The answer is clear. The lower cup of the golden egg was separated from its parent body and became the earth. It was only this portion which could assume the form of the earth. The stock of Āpah and Prithivī paramāṇus which was in the lower cup did almost exhaust itself in this process. Therefore the world of earth was created once only; so also it happened with the other two worlds. The material of which these two were composed did almost exhaust itself with the upper portion of the cup. This fact of the single birth of these worlds in a cycle is stated in the following Veda mantra:

\[\text{सक्खु चीरजायत सक्खु भूमिरजायत।} \]
\[\text{पुष्यां दुर्घ सक्खु पयस् तदन्यो नानु जायते।} \]
\[\text{ऋ-ह ६१४६। २२।} \]

i.e., once alone the heavenly world was born, once the earth was born. The milk of the variegated cow [from which were born the Maruts] was milked only once. After this another heaven or another earth is not born at a later period in a cycle, from one egg.

The third quarter of the above mantra is again repeated in a slightly different way in the hymn of Bharadvāja, pertaining to the Maruts:

\[\text{सक्खुचक्रं दुर्घउ पृष्ठिरुध:।} \]
\[\text{ऋ-ह ६१६॥} \]

i.e., Once only the variegated cow takes out the essence from the breast.

Note—Maruts are groups of gods of the middle region. Their range is up to the sun. The magnetic fields from the sun to the earth are due to them.
CHAPTER XVI

THE WORLDS BEGAN TO RECEDE

1. The above mentioned state of heaven and earth did not last long. The gods were already born. They began to work and the result was that heaven and earth began to recede. It is said in this connection:

(क) चावापृष्ठिवी सहास्ताम्। ते वियती भ्रूः ताम्।
     तैो स्तो ५३२०१३।।

i.e., Heaven and earth were together; separating they said.

(ख) इसे वै सहास्ताम्। ते वियती भ्रूः ताम्। मैो स्तो ३१२०१३।।

i.e., These worlds were together; separating they said.

(ग) इमी वै लोको चह सत्ती व्यायाताम्। जैो ब्राह्मण १४१६,१४५।।

i.e., These two worlds being together, went asunder.

The circumstances or the forces under which the receding began are also stated.

2. FORCES THAT SEPARATED THE WORLDS

I. The first of these was Vāyu:—

(इ) इसे वै सहास्ताम्। ते वायुव्यायाताम्। तैो स्तो ३१४३।।
     काठकस्तो १३१२।।

i.e., These worlds were together; Vāyu blew them apart.

II. The second was Agni:—

(क) प्रस्तन्त्र्यायांति बीतये-इति। तद्विव्यति भवति बीतये-इति।
     ……ुस्ते देवा भक्तामन्त। कथं तु इसे लोका बितरा स्थुः। कथं तु इतं
     वरिय इव स्याविदित। तानेत्तेत्रेव तिमिरक्षर: व्यांनयन् बीतये-इति।
     त
     इसे विद्वूंर्लोकः। शुः ब्राह्मण १५१४।१२,२७।।
i.e., Come hither, Agni! to expand. That it becomes; in order to expand......The gods desired, 'How could these worlds of ours become farther apart from one another? How could it be, as if more spacious. These worlds they separated with the three syllables vi-ta-ye, and these three worlds became far apart from one another.

Note—The vibrations, caused by the sound of the three syllables, helped in the receding of the three worlds.

(ख) प्रग्न मा याहि बीतये......इति वा हमी लोकों व्येताम्।
प्रग्न मायाहि बीतये-इति यदाहु-प्रनयोऽलोकोर्योर्वतिवः।तैः सः ५।१५॥

i.e., O Agni! come hither to expand; (with these syllables) the two worlds went asunder; in that he says, 'O Agni! come hither to expand,' it is for the separation of these worlds.

Note—J. Eggeling (Śat. I. 4. 1. 22), A. B. Keith (Taitt. S. V.1.5), and W. Caland (Śāṅkhā. Śr. III. 5.2), all translate the word vitaye as 'for the meal or food;' 'for enjoyment' and 'to the feast,' respectively. Now, it is true that the word vitaye means 'for drinking' (Nirukta V. 15), as well as 'for eating' (Skanda on Rig I. 13. 6); but in the context under review, no such meaning of the word is ever known. The simple and the only correct translation of the word is given here. Those who know the Vedic technique will support it. All the ancient specialists of the divine Vedic lore are one in this rendering. This is further clear from the fact that Dr. A. B. Keith himself shows his inability to change the meaning of the word vitaye, found at the end of the above quotation.

III. The third was Varuṇa:

प्राणाकमृष्यं नृतुंदे बृहत्त दिता नक्षत्रं प्रश्रवच्च भूम।

५।१६॥

i.e., He (Varuṇa) pushed away the great beautiful heaven and the nakṣatra [region], and spread out the earth,
IV. The learned, well versed in the science of sacrifice, while laying down the bricks of the altar, represent the mode of creation of the worlds. They say:—

सच्चिदानन्दस्तुपुरुषः। खावापृथिवी ब्यैता सभो हन्द्रा प्राविन्य अनुसाययय।। तेषामाछिविपत्तमासी।।

i.e., They praised with twentyseven, heaven and earth went apart. Vasus, Rudras and Adityas went apart after them. They became the controllers.

Exactly this idea is repeated in the following passage of the Satapatha Brāhmaṇa in almost the same words:—

सच्चिदानन्दस्तुपुरुषति।।।।।खावापृथिवी ब्यैतां मनो हन्द्रा प्राविन्य अनुसाययय।।

V. The him sound—With this process of moving away of the worlds, the him-sound accompanied the receding movement:—

इति हि लोकाः तृषिसु तानु हिदङ्करेण ब्यैति।।

i.e., These three worlds are [equal to] the three mantras, he [the sacrificer] separates these by the him-sound.

VI. Agnih Forms

Agni exists in the three worlds in various forms. Its three main and fortynine sub-forms are often mentioned in Vedic and Paurāṇika literature. These forms differ on account of the different arrangements of Agni molecules in them. These multiple forms, which were active in this receding operation, should be minutely studied in Vedic texts. The various forms of Agnih are referred to in the following Rik:—

पति यज्ञानाम।।।।।।।।।।

स्रो विवेक रोदसी सुरिन्दस्य।।

i.e., Agni, the protector of the sacrifice, entered into the heaven and the earth in various forms.
CHAPTER XVII

THE MIDDLE REGION EXPANDS

1. I have already said that at first the middle region was extremely small. With the receding of the worlds it now began to expand. It had to play an important role in holding firm the heaven and the earth. Its expansion is described in the following way.

2. Here is a mantra addressed to Purīṣya Agni by the seer Kauśika Gāthin:—

श्रङ्गे यत्वे दिव्व वर्चः पूर्विः यदोपधोधवप्तवः यज्ञः।
पूर्वात्तन्त्रिकसुर्वतितन्य त्वेषः स भानुरङ्गवो नूचक्षा: ।।

ऋ० ११२२१।।

i.e., O Agni! your lustre and vigour, which is in heaven and O Adorable one, which is in the earth, in the cereals [or annual plants], and in waters, and by [which vigour] thou spreadest wide the firmament, that, shining and an ocean of light makes visible the men [of the middle region].

Note—Purīṣya Agni is one of the various forms of Agni. Men of the middle region are often mentioned in the hymns of the Rigveda.¹ These are the Maruta particles. This verse is found in Yajurveda XII. 48 also. Fortunately, its exposition is met with in Śat Br. VII. 1. 1. 23 as follows:—

य एवोधीषु बारितस्तमेतदाहु पूर्वात्तन्त्रिकसुर्वतितन्येति वायुः।

i.e., The Agni, which is in the Oṣadhīs (annual plants) to him this is said, by means of which the middle region was spread wide, i.e., [the region of] Vāyu.

3. Agni alone was not the doer of this job. Indra and Viṣṇu took part in it. It was their joined force which

¹ पूर्वात्तन्त्रिकसुर्वतितन्य नूच्य: । ऋ० ११२१६।।
was working, and hence they are remembered in a pair. It is said in a mantra of the hymn addressed to them by the seer Bharadvāja:—

इन्द्राभिषेकू तत्वन्यायं वां सोमस्य मद उह चक्रमधे।
भ्रकुण्डम्य प्रत्तरिक्षं बरीयो अप्वतं जीवसे नो रजासि।

ॐ ॐ ॐ ॐ

i.e., O ye Indra and Viṣṇu! praiseworthy is that act of you two; being intoxicated with Soma, you cut circles in a wide space. You made the firmament wide, and you spread wide the heaven and earth for our [welfare].

Note—Soma is that heavenly substance which charges the gods with vigour. This is already noted on p. 146.

One of the four kinds of magnets, mentioned in Sanskrit texts, causes a circular movement. And Indra is electricity enveloped by Vāyu. How Indra and Viṣṇu, when charged with Soma, produce that magnetic effect, should be found out?

4. Soma helped in this action: The mantra of the seer Gotama addressed to Soma states:—

त्वमिा भोषधो: सोम विश्वास्तमपो भ्रजनयत्वं गा:\
त्वमा तत्त्वोन्वत्तिरिक्षत्वं ज्योतिषा वि तमो वदवे।

ॐ ॐ ॐ ॐ

i.e., O Soma! you produced all these annual plants, as well as waters and the cows (or rays). You spread wide the firmament; and you removed the darkness [of the middle region], with your lustre.

5. Sun and Vaiśvānara Agni also shared in this action. They are mentioned in the hymn of the seer Mūrdhanvāna, the son of Aṅgirā:—

यो भानुमा पृथिवीं वाम मुनोमाम महातान रोदसी अन्तरिक्षम्।

ॐ ॐ ॐ ॐ
i.e., which (sun along with Vaiśrānara Agni) by means of its ray or lustre expanded the earth and this heaven [as separate units] and the heaven and earth [when they stand united as a pair]; and [also expanded] the middle region,

Note—The expansion of heaven and earth, once under the names of Prithivi and Dyā and again as rodasi, is spoken of twice in a single line. The reason ought to be searched. I think:—

(1) one expansion may be of the individual size of the planets;
(2) the other be of the distance between the two;
(3) and the third be of the size of the world of earth and of the heavenly region as a whole.

The Veda is talking not only of an ordinary expansion, but of the many types which are all contained in this expression. One thing, however, is quite clear. The expansion of the middle region is a definite step in the story of creation. And without a definite knowledge of this act, we cannot appreciate the beautiful explanations of many Vedic mantras.

6. The force of Varuna acts:—
बनेषु व्यतिरिक्तं तत्तान् || ॥ नू ॥ ॥ ॥

i.e., Varuna expanded the middle region in the dense abode of the trees.

Note—The middle region is occupied by Indra, the Marutas and the vanaspatis\(^1\) of the sky. Śaunaka in his Brihaddevatā I. 66, therefore, calls the Agni of the intermediary region as Vanaspati or pertaining to the trees.

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\(^1\) पावको यद् वनस्पतीयं प्र द्वमा मिनास्यज: || नू ॥ ॥ ॥

When Pavaka, the Agni of the middle region, burns the vanaspatis,
CHAPTER XVIII

EXPANSION OF HEAVEN AND EARTH

1. Heaven and earth as a pair are remembered in the Vedic lexicon of Yāska under twenty-four different names, of which rodasi is conspicuous. The receding action separated them both, but their close relation, instead of decreasing, definitely increased. This relation paved the way for the appearance of man on the earth.¹

2. The middle region was expanding, and so also was expanding the heavenly region. The earth, the planets and the stars, were all somewhat shaky. They were moving towards stability, through revolutions or other ways.

3. This expansion process was carried with the help of different gods. It is described below.

(a) Expansion with the help of Indra:—
(१) ब्रह्मरोदसी ज्योतिषा विन्धरातनेत् | खः ६१३५॥
i.e., After it, [Indra], the carrier, expanded heaven and earth with his electric vigour.
(२) ब्रह्म ज्ञावपृष्ठिवी माततानो | वार्ष्कम् मन्त्रोपनिषद् १२ ॥
i.e., I [Indra] expanded the heaven and earth.
(३) इत्त्रो महल्ला रोदसी प्रभृत ्| खः ६१३६॥
i.e., Indra, in his greatness, expanded the heaven and earth.

(b) With the help of Jātavedas Agni:—
प्रणवप्रतिद्वायमप्रमोद्य मन्त्रहलि प्रथमो जातवेदा: |
प्रनु सूर्यस्व पुश्ता व रहस्नु प्रनु शावपृष्ठिवी श्रा ततान ॥

t० स० ६१३६॥

¹ श्रवच्छ जीवसे नो रजसि | खः ६१६६॥
i.e., The gods expanded the worlds for our life.
i.e., O Jātavedas Agni! you at a later period spread wide the heaven and the earth.

(c) With the help of Vaiśvānara Agni:

तब मासा रोदसी वा तत्त्वं । श्रृऽऽ ६१०१६।।

i.e., O Vaiśvānara Agni! with your lustre you expanded the heaven and earth.

वि चरणी विषणे भवत्तमध्व वैसवानरः । श्रृऽऽ ६१०१६।।

i.e., Vaiśvānara Agni expanded heaven and earth.

(d) With the help of Agni:

(१) ग्रामे तत्त्वं रोदसी वि मासा । श्रृऽऽ ६१०१६।।

i.e., O Agni! you expanded the heaven and the earth with your lustre.

(२) ग्रा वस्तत्त्वम रोदसी वि मासा । श्रृऽऽ ६१०१६।।

i.e., O Agni! you expanded on all sides, the heaven and earth with your lustre.

(३) ग्रा हि धावापूविवी प्रसन उमे सदा पुषो न मातरा तत्त्वं ।

श्रृऽऽ ६१०१६।।

i.e., O Agni! you expanded always on all sides both the heaven and earth, just as a mother does her son.

(४) ग्रा यस्ततान रोदसी ग्रा तेन । श्रृऽऽ ६१०१६।।

i.e., The Agni, which expanded the heaven and earth, with the help of Rīta.

(e) The Marutas worked for the growth:

रोदसी हि मस्तताधिकारिके वृक्षे । श्रृऽऽ ६१०१६।।

i.e., The Marutas achieved the increase of the heaven and earth

(f) The two Advins worked:

ग्रा वा रथो रोदसी बद्धचानः ।ः श्रृऽऽ ६१०१६।।

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1. W. Caland (Sansk. Sh. su. VI. 6. 6) translates:—
"Your chariot knocking against earth and sky." This does not fit in.
i.e., O Aśvins! may your chariot pressing asunder the heaven and earth.

(g) The force of Mitra and Varuṇa:—
शुध्दमो रोदसी बद्धवे महित्वा ! त्रै ६ १ ० ८ १ १ ४ ॥
i.e., the force [of Mitra and Varuṇa] presses apart the heaven and earth with might.

Note—The language of the above citations is almost similar for a uniform action. This beautiful similarity is noticed throughout the Veda.
CHAPTER XIX

THE SUN PUSHED UP

1. I have already cited five passages on pp. 154, 155 which show that the seers believed that the sun was just on the earth. Now we see it far away in the high heaven. How it went up? The Vedic texts repeat the process of its going up in different ways. It was raised by the gods and the help of many Sāma songs was at times utilized by them. It is said:—

श्रसावादित्यो शस्मिंलोक भ्रासित | तं देवा: पृष्ठ: परिगृह्य सुवर्ग 
लोकमण्डलन | परिवर्तात पर्यंगृह्यन | दिवाकीर्त्य न सुवर्गां लोके 
प्रत्यास्थापयन | पर: परिवर्तात पर्यंगृह्यन | पृष्ठैवारोहन | स वा 
श्रसावादित्यो शस्मिंलोके परमभयत: परिगृहीत: | ततो सं 

i.e., Yonder sun was in this world. The gods seizing it on all sides with the Priṣṭha [lauds] made it go to the world of heaven. They seized it with Para (Sāmans) from below. And with the Divākīrtya (Sāman) they placed it in the world of heaven. With Para (Sāman) they seized from above, and with the Priṣṭha [lauds] they descended [from heaven]. Yonder sun, indeed, in the world of heaven is seized on all sides by the Para [Sāmans].

Note:—Priṣṭha lauds. These are the Rathantara and Brīhat Sāmans. Tāṇḍya Br. VII 6. supplies an interesting description of them. Para Sāmāns will be explained in the following para. Divākīrtya Sāmans are due to the working of some special rays of the sun. These are:—

(क) रस्मयो वै दिवाकीर्त्यनिन | ऐऽ ब्राहण ॥ १६३॥
(ख) रस्मयो वा एत प्राविन्द्यय यद दिवाकीर्त्यनिन |

ताऽं ब्राहण ॥ १६४॥
(g) दिवाकीर्ष्यानि एव रशमयः। जैऽ ब्राह्मौ २१३५॥
I have not yet studied their distinct form and action.

2. The Para Sāmans are a type of vibrations or waves. The Tāṇḍya Br. says:

परेभेव देवा भा्रीत्यम् स्वगं लोकम् भ्रापरयन्। यद भ्रापरयन्
तत्पराणां परत्रम्। ताऽ ब्रा्मो ४।१३॥

i.e., By means of the Para [sāmans], certainly, the gods conveyed the sun to the world of heaven; because they conveyed (apārayan), therefore they are called the Para (sāmans).

3. The metres or vibrations played their part full well:

छष्ट्रोमिबो देवा भा्रीत्यम् स्वगं लोकम् भ्राहम्। स नाघिनयत। तं
बेराजस्य निधनेतां व्रूघं हुन्। तस्मात् पराण्य चारिबं च भा्रीत्यस्तपति
पराण्य चारिबं चेकार्यः। ताऽ ब्राह्मो १२।१०।१६॥

i.e., By means of the metres the gods brought the sun to the world of heaven; it did not hold (there); by means of the vaṭrāja (-sāman) they fastened it; therefore, the sun shines thitherward and hitherward, for thitherward and hitherward is the sound t. (W. Caland’s translation).

4. Agni carried the sun up:

सो [भा्रीत्यो] आनमस्तीव। स एवं स्तुतः सुवर्गं लोकम् भ्रातमल्ल।
ताऽ सो १५।१६॥

i.e., The sun praised Agni. Agni being praised took him [the sun] to the world of heaven.

5. Agni—This truth is seen in a mantra itself:

प्रमे नक्षत्रमजरस्म भ्रा सूर्यं रोहयो दिविः। नातो १०।१५।१६॥

i.e., O Agni! You pushed up into the heaven above the star, which is never old, and the sun.

Note—I can’t yet explain the difference between the never old star and the sun.

6. Agni Vaiśvānara and the sun:
i.e., When, certainly, the gods, who were performing a sacrifice, established the sun, the son of Aditi, in the heaven.

7. Prisṭha stoma—I have already written in article no. 1 above that the Prisṭha lauds seized the sun and took it to the world of heaven. Ekaviniśa laud is one of the six Prisṭha lauds. While relating its action it is said:—

एकविनीश एष्। एतेन वै देव एकविनीश मातदित्यम् हि। स्वर्गः लोकम् म्यारोहयन्। काठक सं। १३।९॥

i.e., This is the twentieth. By means of this twentieth the gods sent upwards the sun from here to the world of heaven.

These Prisṭha lauds are important in the study of this action which sent the sun upward. From the above accounts it becomes clear that the birth of the gods was a step towards the final phase of the story of creation. The Greeks realized its importance and, consequently tried to understand mythology or the birth and working of the gods.

8. Indra and the rise upwards of the sun—Agni was not alone in the receding movement of the sun. Other gods also took part in it. The share of Indra is described in the following mantras:—

इन्द्रो दीयां च क्षत्र भा सूर्यं रोहयुद् दिविः। शः। १३।३॥

i.e., Indra, in order to enable the world, to exercise the power of vision, pushed up the sun to the world of heaven.

9. Killing of Vritra and Sun’s place in heaven—In his commentary on the above mantra, Skandasvāmin (630 A.D.) notes a historical coincidence thus:—

वृत्रस्तम् तत्रेमाल्लोकांस्तु तत्साक्षरः। सवं तस्मादुदयो भूमक्तेत्त्रस्तं ज्ञानं च। ॥
THE SUN PUSHED UP

तदीय तमसो नुत्थे दिवि सूर्यम् भारोहरयत्।
i.e., Vritra spread far and wide, and covered these worlds with darkness. All [gods] became blind. There upon Indra killed the great cloud, and in order to remove that darkness, caused the sun to mount.

Eternal History—Veda contains eternal history only. Ill-educated scholars, who have a defective knowledge of Vedic lore, mainly interpret the mantras in a general historical sense, but miserably fail to bring out any meaning. Really this ordinary or human history is not to be found anywhere in the Veda. This is further corroborated by the Veda itself. The next mantra is a clear proof of my statement:

वृत्र यदिं शवसा-प्रवधि:
प्रहिम भारति सूर्य दिव्यारोहयो हवे। नान् ११५.११६।।
i.e., O Indra! when you killed the great cloud=vritra, with your might; after that you caused the sun to mount the heavenly region, to enable the world to use its eyesight.

Clearest proof—The mantra clearly states that the mounting of the sun took place after the killing of vritra. Now, there was no human being at that time; how could, then, human history be traced in the Veda? With this much for a correct interpretation, let me again take up the subject proper.

10. Again the work of Indra:—
प्रामालु पप्रमेयर्य आ सूर्य रोहयो दिवि। नान् ११५.११७।।
i.e., O Indra! you cause ripening in the unripe; and you cause the sun to rise up in the world of heaven.

11. A Nitya mantra in praise of Indra:—
प्रात्य मद्वे जरितिरिन्द्रो दिवि सूर्यम् एयहत। निविन्द ११।
i.e., Intoxicated with Soma, Indra sent the sun to the world of heaven.
12. **Mitra and Varuna work**—More than one god work conjointly:

अनु व्रत वश्यो यति मिथ्रो यस्तौ दिव्या रोहयति।

i.e., *Mitra* and *Varuna* follow their vow, when they send the sun to the world of heaven.

13. Again the same pair of gods:

उद्वा पृदासी मचुमन्तो व्रस्तं: क्रो सूयोऽरहेण्टुर्यमणः।

i.e., O ye two [*Mitra* and *Varuna*]! endowed with food, and having *Soma*, stay in the upper region; the sun went up, with shining seed-water.

**Note**—*Sukram arnah*; I have no word to translate this term. It is not ordinary water, but it is something like seed-water. The meanings of such words can be traced out, but it requires a study of years. Prof. Valenkar translates it as ‘bright flood, i.e., the sky.’ *Arnah* is some sort of water. It may be in the form of hydrogen, oxygen or helium, but the word ‘flood’ does not give a clear sense. My translation is also tentative.

14. Sun going up—*Agni*, the son of *Bharata* (a special union of *Agniḥ paramāṇus*), saw the going up of the sun. The *mantra* says:

तस्मा ध्रुविनमरित: शर्म यस्तौ ज्योक्क पश्यातु सूयमुच्चरस्तम्।

i.e., For him, *Agni*, the son of *Bharata* may give happiness; and may look long at the sun, going up.

**Note**—Some translators have found the account of the rising sun in this *Rik*. But “look long” does not suit that meaning. The rising sun takes a very little time in rising. ‘Long’, in that case would be redundant. Hence my translation fits in the context.
15. A *mantra* pertaining to the sun says:—

\[ \text{तेष्वक्षुद्वेदिति पूरस्तां शुक्रम् उच्चवर्ति } \]

i.e., That eye, the source of vision for all, well placed by the gods in the beginning, in the form of *Śukra* (the sun with the seed-water shining), went upwards.

\textbf{Note}—The study of *Śukra* is also necessary for a full understanding of the fuel of the sun.

16. Another *Rik* addressed to *Savitā* or the sun says:—

\[ \text{दिवो रोह्यसिः प्रश्वतः पौष्पियम् } \]

i.e., The sun ascended from the earth to the heights of heaven.

17. A half *Rik* of the all-gods says:—

\[ \text{श्री सूयोऽऽश्वन्त रुक्मणोऽऽश्वन्त यद्रतिव वीतपूष्ठः } \]

\[ \text{र्षेऽ वृत्तां रोह्यसिः } \]

i.e., The sun went up with the shining seed-water, and yoked the horses of shining backs [to its chariot].

\textbf{Note}—The seed-water surrounds the sun. Out of this seed-water the horses of its chariots were born. These horses are in the form of rays.

18. A *Rik* of the all-gods again:—

\[ \text{सूर्य दिविभ रोह्यसिः सुदानवः } \]

\[ \text{र्षेऽ रोह्यसिः } \]

i.e., The all gods, taking up the sun to the world of heaven.

19. A *Rik* of *Pavamāna Soma* says:—

\[ \text{नृभियतः सूयमारोहयो दिविभ } \]

\[ \text{र्षेऽ रोह्यसिः } \]

i.e., Joined with the men of the middle region (=the *Marutās*), you pushed up the sun to the world of heaven.

20. Again a *Rik*, pertaining to *Pavamāna Soma* :—

\[ \text{तं कबिरभो देवबीतम् यासूर्यं रोह्ययो दिविभ } \]

\[ \text{र्षेऽ रोह्यसिः } \]

i.e., O *Pavamāna*! you became a seer; you sent the sun upwards to the region of the heaven.
21. A Rik of the Aṅgirasās says:—

य चतुतेन सूर्यमारोहयनु दिवि प्रप्रथवन् पृथिवीं मातरं वि।

ि.० १०। ६२। ३।

i.e., which, the Aṅgirā rays, sending up the sun to the world of heaven, by means of Rita, and expanded the mother earth.

Note:—These Aṅgirā rays have their place in the southern portion of the sun. Their part in this story of creation will be dealt with in another context also.

22. Indra and Soma took part jointly:—

उत्सूर्यं नयोधे भोलिषा सह। उप छाँ स्कम्मथु: स्कम्मेन

प्रप्रथवं पृथिवीं मातरं वि।।

ि.० ६। ६२। २।।

i.e., You [Indra and Soma] took the sun up, along with the light. You made firm, by means of the firm support the world of heaven; and you expanded the mother earth.

23. Jabārū—Yāska shows the meaning of this word in his Nṛukta—VI. 17, as the sun ‘which rises up with speed.’

Conclusion—These passages clearly state again and again that the sun was pushed up to the high heaven from the vicinity of the earth. Modern science has not yet rediscov-ered this great truth.

24. Another verb is used to represent this upward movement of the sun:—

समाने वै योना भ्रास्ता सूर्येश्चाचिंचन।

तत: सूर्यं छब्बं उदद्रवत। काठक सं० ६१३।।

i.e., The sun and the Agni were in a common womb. From that place the sun ran upwards.

25. Once in Regions High, The Sun Again came near The Earth

I have already quoted in article 3 above that ‘the sun did not hold (in the world of heaven).’ What happened to it, is
clearly stated, and the passages relating to it are given below.

26. The Taittirīya Samhitā says:—

भादिद्यावा धर्मऽपालंडाच धर्मऽ लोकमायय। तेसुविघिमल्लोके
व्यत्त्वत्व इम लोक पुनरस्वेभ्याविमाग्य-एतान हिमाण भ्रजऽहुः।
त माधुःबन। ते सुवर्ग लोकमु भायत। तैःसौः ॥ ॥

i.e., The Ādityāḥ-named rays [now in the northern half of
the sun], went from this world of the earth to the world there
[in heaven]; they became thirsty or greedy in that world of
heaven; they again came to the world of the earth, and hav-
ing kindled the fire here they performed these homa-sacrifices.
They attained glory, they went to the world of heaven.

Note—Under article 20 above, I have written that the
‘Aṅgirā rays have their place in the southern portion of the
sun,’ As against them, the Ādityāḥ rays occupy the northern
portion of the sun. Probably the north and south of the sun
is determined from the position of these rays. What is the
difference between these rays is not yet known to me?

27. The same saṃhitā relates again in an extremely
wonderful manner:—

भादिद्यावा धर्मऽपालं लोकाच धर्मऽ लोकमैत। सोःसूः लोकं
गतवा पुनरिम्म लोकमु ध्यायत। स इम लोकमाग्य मृत्योः:
श्रविकेव मृत्युसंयुक्तं इत्य लोकं सोःसमयत। इमामेवाग्नि सत-
वान। स मा स्तुतः गुरुः लोकं गमिध्यतीत। सोविनमस्तौत। सो
एव स्तुतः सुवर्ग लोकमणयत। तैः सौ ॥ ॥

i.e., The sun went from this world to yonder world; he
having gone to yonder world bethought him again of this
world; having returned to this world he had fear of death,
for this world is, as it were, yoked with death. He reflected,
‘I praise this Agni [of the earth]; he, praised, will make me
go to the world of heaven. He praised Agni. He [Agni],
praised thus, made him go to the world of heaven.
28. देवा वा प्रातिविश्व स्वर्गालोकादृ अवपातादृ प्रविष्णु:।
तमेते: सप्तदशरथ्य वहु:। यदेते स्तोमा भवन्ति-प्रातिविश्व धुल्ये ॥१६॥
चतुर्सिंहो भवन्ति। वर्षमं वे चतुर्सिंहा:। वर्षमणैन सभिमभते
॥१०॥
तस्य पराचीनातिपादादृ प्रविष्णु:। तं सर्वं स्तोमे: पर्वफिषनु:।
विश्वजितमिजिद्वामृ:। बीर्यां वा एतो स्तोमो:। बीर्यानेव तदादिल्यं
पुर्वं ध्वलिति धृत्ये ॥११॥
अनवपादाय। अनतिपादाय ॥१२॥
िे, The Gods were afraid lest the sun should fall down
from the world of heaven; they fastened it (there) by means
of these seventeen-versed stomas; that there are these stomas,
is for the sake of propping up the sun. 9.

They are thirty-four-fold (stomas). The thirty-four-
versed (stoma) is the highest goal; by means of the highest
goal even do they fix it (viz. the sun, the viśuvat-day). 10.

They feared lest it (viz. the sun) might fall across, to
the farther side; they propped it all round (i.e., above and
below) by means of all the stomas: the two Abhijit and
Viśvajit (days); these two stomas are strength, by strength
even they thus prop the sun all round: for the sake of holding
(it); in order that it may not fall down nor fall across.

(W. Caland’s translation.)

Note.—Highest goal or viśuvat is the equinox. The
principle of the equinox-day was known to the seers.

29. Fixation of the Position of the Sun

This is described in the Jaiminiya Br.:—

प्रहोराभ्य देवा प्रातिविश्व तेषौमः प्राति लघ्व ब्रह्माद्वियं
सच्चिनिन दुस्तः भवसन्न अणज्ञातमं
॥ पर्यायं: पुनः प्राक्षच्चमः। तममहिमनेन पुरस्तादृ उदवसन्नः।
जै ॥११ ॥ २१२॥

िे, The gods having won the position of the ahorātra,
brought the yonder sun to a westward or backward position by means of the savanas. Him they again brought to the eastern or the forward position by means of the paryadyas. And by means of Āśvīna they established him in the front.

Note—Ahorātra is not day and night as is commonly understood. It is some physical membrane, which envelops the sun. Day and night were yet non-existent, and the ahorātra a part of samvatsara, had appeared.

30. Definite speed of Receding

What was the speed at which the worlds receded? How much time was taken by the sun to attain the present position? These are difficult questions, but, fortunately, we find certain statements which add to our knowledge in this direction. The following observations are worthy of note:

इमेव सहस्त्राम | ते शम्यामात्रः शम्यामात्रः व्यैताम्।
मै० सं० ४। ११ ७।।

i.e., These worlds were together. They separated the measure of a stick [per day].

इमेव सहस्त्राम | ते शम्यामात्रः शम्यामात्रः व्यैताम्। वज्र-हशम्यः। काठक सं० ३८। ५।।

i.e., These worlds were together, They separated the measure of a stick [per day]. Thunderbolt is the size of the stick.

शाबापृष्ठी सहस्त्रामः | ते शम्यामात्रः एकम् प्रहव्यैतामः।
शम्यामात्रः एकमहः। तै० ब्राह १०। १२। ६।।

i.e., Heaven and earth were together. They separated the measure of a stick per day. A day is of the measure of a stick.

Note—Śamyā is placed in a ritual between the carma and the iṣat, to represent the distance between the heaven and the earth. In astronomical works the measure of 36
aṅgulas or fingers is a Śamyā. I think the measure of a Śamyā, and the duration of a day, in this context, are to be understood in divine measures. The sun, moon and the earth, not being in the present positions at that time, the measures due to them will not help. However, one thing is clear. This speed was not great. This process went on and at last the receding stopped.

Dr. Ein Stein and others have expressed the view that the process of receding is still going on. But the Vedic seers have definitely stated that the process ceased at some time.

A number of Rigveda verses, besides those already quoted refer to the spreading of the firmament; for without its expansion, the separation of heaven and earth could not be possible.

31. **Period taken For Separation**

There is a clear statement about the period taken by the separation process. It is noted on p. 155, no. 4—

That ‘the Sun was taken up in six months.’

What are these months, should be studied with the help of the interpretations in the Brāhmaṇas.
CHAPTER XX

SHAKY AND UNSTABLE WORLDS

1. During this period the earth and the heavenly bodies were all shak". In course of time, however, the gods adjusted them and the paths of the sun, the moon, the earth, the stars and the remaining planets were settled. This process was carried on by the gods according to the Eternal Law, already stated.

2. The shaky position is mentioned in the following way:

तद यथा हैं। इदं रथचक्रं वा कौलालचक्रं वा प्रतिष्ठितं जन्मदेः एवं हृदेमा लोकं भवतुष्वा प्राप्तिष्ठितं भ्रासुः। स हृ प्रजापतिः

रीक्षां च। कथनं स्विने लोकं भूतं प्रतिष्ठितं स्यूः, इति। स न्योनिमित्वम् भूत भ्रासु।

एविष्च वर्त्ताणां दीपिनेन इमामु भ्रासु हुत। व्योमिकर्मिनिश्च

प्राप्तिरिक्षां। जोमूत्रेष्वऽ नल्कारः विद्वृम्। श्राद्र्य १११।२।१।२।

i.e., Verily, even as this cart wheel, or a potters wheel, would creak if not steadied, so, indeed, were these worlds unfirm and unsteadied. Prajāpati then desired, ‘How may these worlds become firm and steadied’? By means of the mountains and rivers he made firm this (earth), by means of the birds [not of this earth] and the rays [of the Maruts] the middle region, and by means of the primordial clouds and the stars the world of heaven.

Note—Birds of the middle region should not be confused with the birds of the earth. Along with the birds the middle region has the beasts as well (Rig. X. 90. 8). Again it has the groups of Maruts. A Marut is called narah, which means ‘man’ or of the ‘shape of a man.’ Another Maruta is called marici, which is referred to in the Bhagavadgītā. All
these different objects and some of them with electric qualities, keep the middle region firm. Therefore, it is said:—

हान्तरिक्षं वयासिः। तैः सोऽऽाऽ।

i.e., Make firm, in the middle region, the birds.†

**Bible repeats this truth**—The chapter of Genesis contains the following sentence:—

"and fowl that may fly above the earth in the open firmament of heavens."

"Firmament of heavens", conveys the simple meaning of beyond the world of the earth and in the region of the heaven. Other explanations may be given, but those will not be the simple translations. Though the statement of the Bible conveys the above meaning, yet it is not as clear as the Vedic statement.

**Jimūta** is an ordinary cloud in common Sanskrit, but it is not this object, when the context is of the heavenly region. Cloud or *megha* is a very late stage of **Jimūta**, and is formed in the atmosphere of the earth.

3. Again it is said in another Brāhmaṇa:—

प्रजापति: प्रजा प्रसूत:। ता: न प्रत्यथिष्ठन:।...... हमे लोका न प्रत्यथिष्ठन:। तातो व्रोऽ २४।१२।।

i.e., *Prajāpati* created the subjects (the worlds); these found no firm support,....... ....These worlds found no firm support.

4. The same fact is repeated in other words:—

हमे वै लोका प्रावता (काठक-प्रावता, corrected reading—प्रावता) प्रासू। ते संप्राकम्प्त तानू देवा एते: यजुर्भ: क्षतस्मुनव। यदैत: परिदीनू परिद्विधाति एवं लोकानं विधृत्ये। कपिष्ठल सोऽ १६।१४।।

काठक सोऽ २५।१६।।

i.e., These worlds, certainly, were unstable. They trembled. The gods made them stable with these-\textit{Yaju}-formulas.

†. वयासिः प्राप्त: प्रतिपेठः। वण्डः सोऽऽोऽ ११।२४।।
SHAKY AND UNSTABLE WORLDS

For, by means of these (formulas) he lays round the enclosures. This is for the stability of these worlds.

Note—*Yaju mantras* were already in Nature, when the worlds were in the course of formation. Then the supposition that Yajurveda is a later veda, is the result of a sophisticated philology only. The worlds are enclosed; and the enclosures were necessary to make the worlds stable. The story of enclosures should be written separately.

5. Still there is another way of explaining this truth:—

\[ हुस्तां हुर्या इति हविषो गृहोतादृ इमे लोका उद्वेष्ट । तान्
\]

\[ देवा एते यजुषा ब्रह्म हनु । मैंो सों चाँगुः ॥ १११६॥
\]

i.e., ‘May the houses [of the planets in conjunction with the earth] become firm.’ From the holder of the oblation. These worlds trembled upwards. Those [trembling worlds] the gods made firm with this *Yaju* formula.

6. There are many *mantras* in the Vedas, which often allude to the prayer that ‘the worlds be made firm’. This prayer gives a clue to the fact that the worlds were not firm at some time. Some of these *mantras* will he quoted in the next chapter.

7. Astronomical Knowledge—The present day astronomy is yet far from the knowledge of this adjustment. This is one of the most subtle problems and the Vedic seers have supplied ample data in this respect.

\[ १ हुस्तानी—काठक सं ॥ २११॥
\]
CHAPTER XXI

THE WORLDS MADE FIRM

1. The world of earth and the world of heaven, sometimes separately and sometimes together, are depicted as made firm. The mantras, which describe this phenomenon are many and the reader will feel that I have uselessly repeated the same idea again and again. But I think that there is a very fine difference in this description, which I have not yet grasped. So, with a conviction that some abler intellect will undertake this job in future, I have tried to bring into one place a majority of these references.

2. Kaḥ or Prajāpati himself made firm:—
veda dvipāa pūrthibī c cdha ved sv: sthitam veda nāk: ।

kaḥ 11111111

i.e., By whom the fierce world of heaven, and [the same type of] the world of earth were made firm, and by whom the abode of bliss and the world of Nāka (where is perfect absence of any pain), were stabilized; [Him, we adore].

Note—Some translators join the adjective ugrā with heaven only; but the reading of another samhitā helps my interpretation:—
veda dvipāa pūrthibī c cdhe । tāt sām 41414144

Here the verb is in the plural, which suggests that the fierce earth also was made firm along with the fierce heaven.

Moreover, we know from other passages also that the earth was fierce at that time. Svāh and Nāka are two different worlds in or beyond heaven. The latter Nāka is a special type of Agni which destroys the rakṣas, and occupies a portion of heaven.¹ These, however, I am not taking up here.

¹ sa nākō nām dvipī rakṣoḥaṁ: । mērāsan 41414

...
It is this mantra, which I used to recite in the daily homa, that set me a thinking about the earlier, unstable condition of the earth; slowly and slowly other mantras followed in its lead. Brāhmaṇa works then came to my help. The result was a knowledge of the complete story of creation.

What survived of Prajāpati, at this stage, is not known to me? His name Kaḥ is, therefore, a mystery.

3. Prajāpati’s work again:—

 yö ḍhāvaḥ-puṣṭi-viḥ tāstāmāne pṛāvāryud rōdsi rājāmāne ।

mā śo rāmā ṭaṅga ṭaṅga ॥

i.e., Who made stable the heaven and earth, as well as held the trembling heaven and earth.

Note—The second half of this mantra shows that the trembling continued for some time, and Prajāpati held them. It is, therefore, plain that during the process of separation also the trembling continued.

4. Agni performed the same duty:—

brjād u kṣāṃ dāvahāḥ puṣṭi-viḥ tāstāmā bhī māṣeṁ: saṁy+: ।

kṛṣṇa ्rāṇū ṭaṅga ṭaṅga ॥

i.e., As Aja (a form of Agni) holds the earth, when it is in the Kṣād state, so was held or stabilized the heavenly region [by Agni] by means of the mantras, which always work in a similar way.

Oldenberg translates—“As the goat (supports) the earth, thus he supports the earth, he upholds the sky by his efficacious spells.”

Translation untenable—Oldenberg could easily avoid a wrong translation, but his natural missionary prejudice, compelled him to translate the word ajā as a ‘goat’. It really means a thing which is unborn. So it may denote God, or
the primordial cause of the universe, or the soul or a paramāṇu like substance. A goat never supports the earth; and the translation, therefore, of Oldenberg, like many other translations of the Vedas by his type of scholars, is untenable. Mantras are sound-vibrations and not spells. These sound-waves turn into electricity. The Veda declares:—

"Gau or Vāk i.e., speech or the sound-waves, when they turn into electricity." Rigveda I. 164. 29.

"Spell" is a crude translation.

Note—The Kṣā state of earth should be minutely studied.

Meaning of 'aja'—Aja is a subsequent transformation of Agni, Veda, itself, clarifies this meaning:—

\[ \text{प्रजो हृदेरजनिष्टः शोकान्।} \text{श्रव्यः} \text{४१४१११।} \]

i.e., Aja was born from the lustre-giving particles of Agni.

Śat. B. VI. 1. 1. 11 also refers to this aja, and not to the animal goat.

Oldenberg's disciple, Whitney—W. D. Whitney's senseless translation, of the above, is reproduced below for the sake of comparison:—

"Since the goat has been born from the heat of Agni." Alas! Whitney is no more to explain the motive behind such a translation.

5. Agni stabilizes the world of Nāka:—

\[ \text{उदस्तमभितु समिधा नाकमव्यो विनः।} \text{क्रू० ३१४१३०१।} \]

i.e., Agni, the great, made stable upwards, the world of Nāka, by means of lustre-shedding particles.

6. The god Varuṇa works for the same purpose:—

\[ \text{प्रस्तवनाद बाम असुरो विस्ववेदा।} \text{क्रू० ४२१३१।} \]
i.e., The *Asura* [Varuṇa], the knower of all, made stable the world of heaven.

**Note**—Articles and books have been written on Varuṇa in Bhārata and abroad, but not a line has been written about his real physical aspect, or his connection, whatsoever it be, with the Mahābhūtas.

7. The same god Varuṇa effects it under another name:—

ङ्गस्तम्नात्रू चामु चृष्णभो ध्रुतरिक्षम्।
तैः संसौ १२।१॥

i.e., [God Varuṇa], who pours rain, made stable the world of heaven and the mid-region.¹

**Note**—The stability of the mid-region is the outcome of a systemic work of Indra, Marutās and the birds, of course, not of the earth.

8. Varuṇa's further working:—

वि यस्तस्तम्भ रोदसी चिह्नािी।
ऋ० ६।६६॥

i.e., Who made fully stable the worlds of the extensive heaven and earth.

9. Again the same god:—

शाकालुयिवी वहणस्य धर्मणा विष्कम्बिते ग्रजरे मूरितसा।
ऋ० ६।६०॥

i.e., Both heaven and earth, which are never old, are held stable by the law of Varuṇa, who abounds in strength.

**Note**—That law of Varuṇa, is explained in many *mantras*. The verb used in earlier quotations for stability is different from the one used in this mantra and its fine difference in meaning should be found out.

10. *Indra* also took part in this work:—

यो चामु यस्तस्तम्नातु स जनास हिन्द्।
ऋ० २।२॥

i.e., Who made stable the world of heaven, he O people!

¹ A.A. Macdoull—"air atmosphere"; Vedic Reader. A hopeless translation.
11. And again:—

ग्रहणे दाम् ग्रस्तमवद् धारितम्। क्रो २१२२।

i.e., In a space without support, he made stable the great world of heaven,

12. Still again:—

य इमे दामापूर्वी महित्वा बलेन स्थं हृत्य ग्रस्तिमतिहेत्ति:।
मै० सं० ४११९१२।

i.e., Who made firm by his greatness and strength the worlds of heaven and earth, he is Indra, the killer of the enemies.

13. Once more:—

ग्रस्तमनातु मायया दामू ग्रवस्तव:। क्रो २१२२।

i.e., He made firm the heaven and earth [and saved them] from fall, according to his laws of intelligence.

14. *Indra* established six:—

ष्ठु ग्रस्तम्ना विष्टीर:। क्रो २१२२।

i.e., *Indra* made firm or established the widespread six.

Note—According to Sāyana the six are; heaven and earth, day and night, Āphaṭ and the herbs [probably of the middle region]. I am not certain about these six, but the Vedic technique should be deciphered.

15. Again the previous theme:—

ग्रवं दामापूर्वी विष्टकभायतू क्रो ६१२२।

i.e., This [Indra] made stable heaven and earth.

16. *Vāruṇa* is called *risabha* under no. 7 above, and *Indra* is termed *vrisabha* in the following mantra of a similar context:—

ग्रस्तमनाद चां वृषभो ग्रस्तिकृतम्। क्रो २१२१६।

i.e., [Indra] endowed with great strength, made stable the world of heaven and the middle region,
17. The oft praised Indra works:—
ब्राह्म रोदशी वितर विष्कम्बन्यत । ऋ ५१६१४।।
i.e., after this [Indra] made stable the vast heaven and earth.

18. Indra establishes the Naka world:—
ब्रस्तम्भनात्नाक स्वपस्वया पूःषम् ॥ ऋ ११६३।।
i.e., [Indra] made stable the vast world of Naka with a desire of a noble deed.

Note—Prajapati worked for the stability of the Naka world. This is already mentioned under no. 2 above. Here Indra is remembered for a similar action.

19. Indra works with his might:—
उदू यासूं ब्रस्तम्भना श्रीमता ॥ ऋ ११५९।।
i.e., Indra with his might, made stable the heaven in the upper region.

20. Indra takes the help of the sun:—
महो चिद यासूम प्रातःनील सूर्येण चाषक्षम विष्कम्बन्ते दुष्कमीयान ॥
ऋ ११५५।।
i.e., And further [Indra] extended the great heaven with the help of the sun, and he the great stabilizer, with a support, made it stable.

21. Indra did it in the vicinity:—
उदस्तम्भ: पृष्योष्य नामभीके । ऋ ११५५।।
i.e., [Indra] held upwards the earth and the heaven in the vicinity.

Note—The deep sense is not quite clear to me. A comparative study will unravel the secret. The holding of the earth upwards may mean the stabilization of the earth above the water-like liquid or molten strata.

22. The working of Indra again:—
The flattening of the earth will be dealt with later.

23. The working of *Indra* to this purpose:—

 śrasya māvē jariśrīnāū vāēgaū pṛastambāūt, nāvītū 1111

i.e., O ye, who praise! [know that] in the intoxication of [Soma], *Indra* made stable upwards, the world of heaven.

24. *Indra*, the pourer of strength, worked:—

sōmīchānewe śṛṇṇē vi śāmaśāyati kūṛṇā: 1 ṅō 104141511

i.e., [Indra], the pourer of strength, makes stable the heaven and earth, which were well placed.

Note—The word used for heaven and earth is *dhīśne*. It must convey a different phase of them. I do not know that phase yet.

25. *Indra*, the great, works:—

up āmumōvē bhūdū iśmūd śatmāya: 1 ṅō 611171711

i.e., O *Indra*, you great I made stable the great world of heaven.

26. *Indra* and *Soma* work together:—

up chaśkamāṇē śkamāne 1 ṅō 61721211

i.e., [Indra and Soma] both made stable the heaven with the support.

**INDRA'S GREAT PART**

God *Indra* played the greatest part in making the worlds firm and stable. Quotations from nos. 10—26 bear testimony to my statement. Although the list quoted above is not final, yet a study of the Vedas and their different recensions will support my statement,
27. *Soma*, not only acted along with *Indra* in this direction, but it acted individually also:—

\[ जय महानु महता स्कमकोन उद्य राहु प्रस्तम्नादन वृषभो महत्वानु। \]

\[ क्र० ६१४७१५।२१ \]

i.e., This great *[Soma]*, endowed with extraordinary strength, by means of the great support, having Maruts with it, made stable in the upward region, the world of heaven.

28. *Soma* again:—

\[ जयं दावपुष्पिवी विषमादतः। क्र० ६१४७१५।२१ \]

i.e., This *[Soma]* made stable the heaven and earth.

29. *Viṣṇu* performs his duty and helps in this act:—

\[ उद्सर्वम्ना नाकमृत्वं बहुतम्। क्र० ६१४७१५।२१ \]

i.e., *Viṣṇu* made stable in the upward region, the world of *Nāka*, which is sublime and great.

30. Compare the work of *Agni* to the same effect:—

\[ उद्सर्वम्नीतु समिधा नाकमृत्वो थ्रिनः। क्र० ६११७१५।२१ \]

i.e., The sublime *Agni*, with its fuel, made stable in the upward region, the world of *Nāka*.

31. *Viṣṇu* again in the *mantra* which follows the *mantra* quoted under no. 29.

\[ उद्सर्वम्ना रोदसी विषणवते। क्र० ६१६१२१।२१ \]

i.e., O *Viṣṇu*! you specially made stable these heaven and earth.

32. *Viṣṇu*, once more:—

\[ उद्सर्वम्ना रोदसी विषण एले। मै० स० ११२६।२१ \]

i.e., O *Viṣṇu*! you gave special support to these heaven and earth.

33. *Mitra* and *Vaiśvānara* work it:—

\[ उद्सर्वम्नादु रोदसी मित्रो ग्राह्मुल। क्र० ६१६१३।२१ \]

i.e., The wonderful *Mitra* made stable the heaven and earth.
34. Viśvedevāḥ or the all-gods work:—

 Śrāvaṃśūmi pūrviṁśī śṛṇivārojasaḥ

 i.e., The all-gods, made stable, with their might, the heaven and earth as well as the flattened earth.

Note—Bhūmi and prithivi, the two stages of the earth, are mentioned in this mantra. This shows that the all-gods began their work of stabilizing from almost the very birth of the earth. This saved the earth from destruction.

35. The all-gods again:—

 Śraddhāṃ śrāvanāḥ-śriyāḥ śrāvaro rojasāḥ

 i.e., [The all-gods], having made stable the heaven and earth, made the Āpāḥ with their might.

36. Savitā also played his part:—

 śṛṇivāro sāvitaḥ dānāḥ pravaḥhutu

 i.e., In a space without any support, Savitā made firm the world of heaven.

The Northern Abode

37. Besides heaven, earth, Nāka and Svāh the Northern abode is also important. Its exact significance is yet to be determined. It is said in the hymn of Viṣṇu:—

 yoh śṛṇivāro bhūtara viṣṇam pravahaḥ

 i.e., [Viṣṇu], who made stable the Northern abode.

Note—Śāyāna translates the word uttaram as 'which is further i.e., the middle region. J. Eggeling (Sat. Br. III. 5. 3, 21) translates "who. Viṣṇu propped the upper seat striding thrice."

Stabilization of the Earth and its Directions

38. Some more mantras, which throw further light on the various aspects of this process, are given below.

39. Rays hold the earth:—
i.e., [thou O Vishnu!] hast made firm the earth around with rays.

40. The above passage in a slightly different reading:—

i.e., [Vishnu] held the earth on all sides with rays.

European translators—H. H. Wilson translates the word mayākhaiti into, ‘with mountains'; A. B. Keith, ‘with pegs'; A. A. Macdonell, ‘with pegs'; Geldner, ‘wir Kernen (nur); All these translations show the inability of the translators to grasp the sense of the mantra. The rays with the help of the Maruts create a magnetic field and thus support the earth.

41. Vishnu secures the directions of the earth:—

i.e., [O Vishnu!] thou hast made firm the Eastern direction of the earth.

Valenkar’s translation—This translator gives the following translation; “and supported the eastern summit of the earth.” The word ‘summit’ required proof, which he did not advance. The sense has not been made clear.

42. Varuna also performed this job:—

i.e., Who [Varuna] established a beautiful direction above the earth.

Note—The underlying idea of “above the earth” requires further study.

43. A similar idea about the many directions of the earth is expressed in other words:—

i.e., Varuna established a beautiful direction above the earth.
i.e., Who [Brihaspati], made stable with his might, the ends or the directions of the earth.

Note—The use of the word jma for earth must have a significance of its own. I have not found its clue. The planet Brihaspati, as well as other planets did come into existence, at a very early period.

Further Adjustment For Firmness

1. **Middle Region, an Axle**—The two worlds are the two wheels of an axle:

   तदु वा भ्राहः। यथा वा ब्रह्मेण चक्रो विपातस्यो-एवमेतेनेन्दु लोको
   विपातस्य। जैसे ब्रह्म १.१४॥

   i.e., And, therefore, the seers say, just as the two wheels remain firmly set up by means of an axle, so also these two worlds are firmly set up by means of this [middle region].

   इन्द्रारिनिष्या वा हमी लोको विधृतो। तैसे सातः ५। २। २।

   i.e., These two worlds are held fast by Indra and Agni.

2. This is again expressed in other words:

   श्रीरक्षा भूत्वा दिवम् ग्रहस्तनात्। जैसे ब्रह्म १.१३॥

   i.e., Becoming the middle region, it made firm the heaven.

3. **Quarters bestow Firmness**—Quarters are also mentioned as a cause of firmness:

   एषाँ वै देवा हमान लोकान्त् उक्सा कुत्वा त्रिमिर्दं हृत्। दिमिशः
   पर्यंतवन्। जैसे ब्रह्म ६।२।२।१॥

   i.e., For the gods, having made these worlds, a fire pan, made them firm by means of the quarters, and also encircled and extended them by means of the quarters.

Note—It should be noted that the teacher definitely states that all these worlds have their quarters. What those quarters are, is a matter for further research? How the quarters encircle the worlds, is also to be studied? One thing, however, is clear; the worlds are under the influence of Agni
paramāṇus. These are, therefore, called the fire pans. And the quarters are made up of magnetically charged 'rays' or particles. These rays arrange themselves in such a form as to strengthen the worlds. This will be further evident below.

Quarters Inside and Outside—The importance of the quarters is noticed:

तस्माद एवं लोकानाम् प्रस्ततित्व वाह्यतत्त्व दिश: ।

i.e., Hence the quarters are inside these worlds and outside as well......countless are the quarters.

4. Quarters are the boundaries—The great sage Aitareya teaches that the quarters are nothing, but the boundaries of the worlds:

दिश: परिषयः । श्रो ॥ प्रार ॥ शक ॥

i.e., The quarters are the boundaries.

5. Quarters protect the Worlds—It is stated in the Shatapatha Br.:

गुण्ये बाध्यतिः परिषयों भवति । श्रो ॥ प्रार ॥ शक ॥ शक ॥ शक ॥

i.e., For protection, the boundaries surround [the worlds].

6. Quarters, a collection of Rays—The formation of quarters is due to certain rays, which form special clusters. It is said:

परिषयों रक्षयः । मै० सूर ॥ शक ॥ शक ॥

i.e., The surrounding boundaries are nothing but rays.

Quarters of the Heaven—This world of ours is a closed world, and hence the heaven of our world is also closed:

अस्य गायो विद्विष्णुरति परि सचो प्रल्सान । श्रो ॥ शक ॥ शक ॥

i.e., The rays of the sun at once travel round the quarters of heaven.

7. Quarters attain Firmness—The formation of the quarters causes the firmness of the worlds, and in turn, they
themselves are made firm by the magnetic field formed by the rays. It is said:

तेजसा दिशा जव्ह । मै० सो ३०५१०६।। यजु० १०।६२।।

i.e., By the paramāṇus in the form of rays, shedding lustre, or creating a magnetic field, make firm the quarters in the upper region.

8. How, Magnetic Fields—The arrangement of the rays as to form a magnetic field is quite clear from the following statement:

दिशो वै तीर्थम्यः [ सूच्य: ] शृ ब्रा० १३१२।१०१३।।

i.e., The quarters, certainly, are the iron needles.

Note—The technical term 'iron needles' cannot be explained without the acceptance of a magnetic field for which the Marutas also are responsible.

Further, remarkable points about the quarters are noted in my work, Veda Vidyā nidarshana.

9. Modern thought—The renowned scientific thinker Einstein held the following opinion about the boundaries:

"The universe is a restless place: stars, nebulae, galaxies, and all the vast gravitational systems of outer space are incessantly in motion. But their movements can be described only with respect to each other, for in space there are no directions and no boundaries."

The phenomenon of the gravitational systems is not so easy as to be explained by mere motion. It is an intricate affair, and will be explained by future scholars with the help of the observations of the seers.

10. Modern thought about the Sun—The boundary of the earth is well known. But a similar boundary of the sun is not accepted. Gamow and Cleveland write:

"The sun, since it is made entirely of gas, has no definite boundary like the solid earth has."

1. The Universe and Dr. Einstein, p. 50.
Veda gives a different version—*Vishvāvasu Gandharva*, the divine seer, who is not a human being, but is a part and parcel of some rays of the sun,\(^1\) sings:—

तदन्तथवदिन्द्रो राष्ट्राणा आसां परि सुवर्णिप परिधीमु भववघल्ल।

\( \text{कृ} 10 \ | \ 136 \ | \ 41 \)

i.e., *Indra*, the sender of these [\( \text{अपह} \), to the upper regions], knew their upward movement, and saw the boundaries of the sun from all sides.

**Note**—Vedic technique is manifold here; but I am only concerned with the existence of the boundaries at present.

11. **Three-nights Sacrifice**—This sacrifice which once took place in nature, is also responsible for the close adherence of the worlds. It is said:—

तिरातियैव लोक कल्यणवति | तिरातियैः न्यान्तरिक्षम् | तिरातियाः कोकम् | यथा गुणं गुणं ज्योत्स्वति | एवभव तत्त्वों लोकमन्वतस्वति | भूतवा भ्रमिष्टि-लम्बवाय | \( \text{स्त} 10 \ सं 712|14\)

i.e., By means of the three nights sacrifice he makes fit this world, by means of the three nights sacrifice, the mid-region and by means of the three nights sacrifice the yonder world. As a man interweaves a cord on a cord, so he interweaves one world on another world. It is for firmness and not allowing them to remain loose.

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1. Mahābhārata explains the nature of these seers, Śhānti 372, 3.
CHAPTER XXII

THE EARTH AGAIN

Nine Creations pertaining to the Earth

I have already written on pp. 130-33 that when bhūmi or the earth-cup separated from its parent, the Hiranyagarbha or Prajāpāti, it was a mere mass of Āpah. Its salīla form is often remembered in Vedic texts. Its chemical properties are not yet known, but one thing is apparent that a part of the molecules of the Real Element Prithivī was dissolved in it, and, the liquid state of Āpah i.e., water had begun. This can be grasped from a passage of the Shatapatha Brāhmaṇa, quoted above on p. 131. This is repeated with further explanations below:

i.e., And which was the shell or the cup, that became a major part of the Prithivī Element. 11.

He [Prajāpati] desired, ‘from these Āpah (waters), may I generate this (earth)!’ with full effort, he compressed the shell part containing molecules of the Real Element Prithivī, and pierced it into the waters, (for the formation of) that earth, the juice which flowed away (from the shell, that became a tortoise (hard skinned, bald earth crust); and that which was turned upwards (became, what is produced above here over the waters, (i.e., fungus like growth). All that Prithivī Element dissolved itself in those waters: all this (dissolved form) appeared as one form only, namely water.

Note—The difference between Prithivī and bhūmi is not fully clear in this passage. The shell contained a major portion of the Prithivī Element, and under what conditions was it compressed with full effort should be found out. It finally

1. भकाद्या निस्तूला भूमिह्यती कृमिप्रपूण्डर्यं शान्तिर्य ॥ २२५२॥
   i.e., The earth, without plants and void of straw, appeared like the back of a tortoise.
got dissolved in waters. Temperature and pressure of that time must have caused it. Tortoise is the harder part of that dissolved matter and the matter produced over the Āpah or the final watery state is the arkah or the fungus-like growth. I hope future scientists in this field, will give a better picture of the whole process.

Now will follow the Nine Creations’ mentioned in the Shatapatha Brāhmaṇā.

First Creation—Foam

This creation has been described on p. 130 and 136. Observations relating to foam have been quoted there.

Second Creation—Clay

Foam gave rise to the state of clay and a small piece of earth came into existence. Foam got converted into clay. It is said:—

स [के]मो] बृद्धपयः स गुदिणत । एतदेश फैनस्थिते चवस्वावेष्टमानः
प्रवते । स मोपहन्ते सदैव नवति । श्रो ब्राह्मणे ६ ५ १ १ ३ १ ३ १ ।

i.e., He, Prajāpati heated foam, he produced clay; for indeed the foam is heated, when it floats on the water, covering it. When it is beaten, clay indeed it becomes.

There were two main substances at that time. It is said:—

ब्राह्मो द्वयं छोरेव एतदुरूपं गुजछ भ्रापवच । श्रो ब्राह्मणे ६ ५ ४ १ २ १ ३ ।

i.e., And twofold, certainly, is this form, clay and Āpah (water).

Shell, the Parent of the Clay—I have noted above the part played by the shell in the formation of the earth. It is further said in this connection:—

ब्राह्म वस्तुतं कपालमशीरूः एवा सा गृहुः । श्रो ब्राह्मणे ६ ५ १ ४ १ २ ६ ।

i.e., And that which was the shell, it is this clay. And again:—

गयम्बुद इव तत् । [हेयरियम् ।] श्रो ब्राह्मणे ६ ५ १ ४ १ २ १ ६ ।
i.e., That what is clay, it is this earth.

_Bhūmi Expands—_This _bhūmi_ or earth was very small at first. It was almost the size of a span. In course of time certain forces worked, and it began to expand. The _Brāhmaṇa_ observes:—

\[ \text{ताः [पूर्म] ब्राह्मणवत् सा पूर्वीयःबलु। ब्र ० ब्र ० ६।११।१५।१४।} \]

i.e., He expanded this _bhūmi_, it became _prithivī_. The Vedic _mantras_ express it in very clear terms:—

\[ (१) \text{वि समना भूमिप्रविष्ट। हृ ० २।११७।} \]

i.e., The level-earth expanded.

_Note_—The adjective ‘level’ shows that the hills and mountains are later upheavells.

\[ (२) \text{प्राप्तच भूमू। हृ ० ७।६।११।} \]

i.e. [Varuna] expanded _bhūmi_ or the earth.

\[ (३) \text{प्राप्त च भूमि दंसो। हृ ० ६।१७।३।} \]

i.e., [O Indra!] you further expanded, by your mighty deed, the expanded earth.

_Note_—The word used for earth here is _Kṣa_. Probably it denotes only slightly expanded earth.

\[ (४) \text{उप्र तता भूमिस्तूर्जणम्। हृ ० ६।१७।२०।} \]

i.e., This earth, which has become expanded, became a roaming place for the _asuras_.

_Prithivi goes on expanding—_ _Bhūmi_ was slowly and slowly assuming the form of _Prithivi_, i.e., of expanded size. This expansion took some time.

_Small Prithivi—_ _Bhūmi_ had expanded and got converted into _Prithivī_. But even as _Prithivī_ it was not so big, as it is now. The _Taittiriya samhitā_ remarks:—
i.e., *Suvardhānu*, the descendant of *asura*, pierced the sun with darkness. For him (the sun), the gods desired a penance for restoration. Of his first destruction of darkness, it became the black *aviḥ*. And what they cut from the seat, that became *aviḥ vashā*=unproductive soil. And then, certainly, the earth was small. That *aviḥ vashā*, they brought in close touch, with the rays of the northern part of the sun, for the fulfilment of the desire. After that the earth spread wide.

Note—Scholars have measured the depths of their intellects in interpreting the above mentioned phenomenon, as an eclipse of a very old period of the sun. They should have well kept in their minds that the incident was of a period when the size of the earth was small, and man had not yet appeared on this planet. Unfortunately, one and all have missed this point, and so have hardly presented the truth underlying it.

Now, in the above passage gods in general are regarded, who destroyed the darkness of the sun. In *Shat. Br.* V.3.2.2, *Soma* and *Rudra* are considered to have destroyed the sin of darkness. *Tāndya Br.* IV. 5.2, explains that certain vibrations on certain days brought harmony in the sun and removed its cover of darkness. *Rigveda* V. 40 is replete with references to this story, and points to *Atri*, who destroyed darkness. This *Atri* is one of the seven divine seers of the Great Bear. Its exposition is found in *Jai. Br.* I. 80, where it is said that *Riṣis* also treated the sun. They requested *Atri* to perform this duty. In reality all these forces worked and removed the darkness. An exhaustive study of this subject will add immensely to the knowledge of the world.

1. इयं [पश्चिमी] वा भविष्यं श्रीमान्: सर्वं परमा भवति। श ० भ ०
   ६११२१३११
Black  

\textit{avīh} and \textit{avīh-vashā} are not any types of sheep, as ordinarily supposed. No animal was yet born at that time; how could, then, there be a mention of such sheep?

Above all it is explicitly stated that at that time, the earth was small. These facts warn us against drawing hasty conclusions about Vedic knowledge. I have, shown the way, and hope that good sense will prevail for the realization of the true worth of this scientific knowledge of the world.

\textit{Ādityas} or ‘rays of the northern part of the sun’. I have given this translation, which is based on the exposition of the \textit{Jaimini Br.}. It is here reproduced:—

\begin{quote}

तद् ये हृ वा एत आदिभयोद्भोजो रश्मयः, त आदिभय:। ये दक्षिणास्ते दिर्गिर्यस:। \textbf{वैन्ध्रो १२६६६।।}

\end{quote}

i.e., Then, those certainly which are northern rays of the sun are \textit{Ādityas}, and those which are the southern rays are the \textit{Āngirasas}.

Surely, no scholar can understand the right sense of the Veda, without a thorough knowledge of the \textit{Brāhmaṇa} works.

Expansion of the earth again—The process of the expansion of the earth was carried on by \textit{Indra}, \textit{Varuṇa} and many other gods. \textit{Varuṇa} accomplished it by means of his rays, as pointed in the Veda \textit{mantra}.

Rays cause Expansion—Yāska throws further light on this point. There is a \textit{mantra} of \textit{Soma} of the Rigveda:—

\begin{quote}

(१) सोम: अन्त:। \textbf{वैस्कृत:। फळो ५० १६५१५।।}

\textit{Yāska} explains the last word as:—

\begin{quote}

प्रथमकर्मण्यामात्रिविरस्वीनाम्। नित्यकृ \textbf{१७११२।।}

\end{quote}

i.e., certain rays of the sun cause expansion of the earth.

\textit{Indra} again:—

\begin{quote}

(२) तद्वृत्तिविच म्यांनृयः। \textbf{तद्वस्तम्या उत्त व्याम्।। फळो ५० ६५६६।।}

[O ye \textit{Indra}!] you expanded the earth, and you the world of heaven.

\textit{Indra’s} subjects the \textit{Marutās}:—

\end{quote}

\end{quote}
THE EARTH AGAIN

(२) दीर्घे पृथु प्रस्थे सदृम पाषिष्यम् । कृि १०१५६१॥

i.e., [The Marutas] expanded in length and breadth the earthly abode.

Note—The words dirgha and prithu convey the idea of extension in different dimensions.

The Marutas acted for the same end :

(४) प्राप्ति याम्मु पृथिवी चिवेयाम् । कृि १०१५६२॥

i.e., The earth expanded by the movements of these [Marutas.]

Note—Marutas are the source of electricity, generally interpreted as lightning only of the mid-region. They survey the area from the earth to the sun. Their action expanded the earth.

Vishvakarma, the divine architect, also performed his duty :

(५) वदेवंता वदत्तहृत पूर्व प्राहिद्र धारापृथिवी प्रमुखताम् ॥

कृि १०१५६३॥

i.e., When, verily, the old boundaries became stable, after that heaven and earth expanded.

Note—'Old boundaries' require further study.

God Savitā (a state of the sun) worked :

(६) ब्रतो भुरत ब्रह्म दिशितं रजोश्चो धारापृथिवी प्रमुखताम् ॥

कृि १०१५६४॥

i.e., On account of Savitā, bhūmi or the earth assumed its form, and the mid-region appeared, as well as heaven and earth expanded.

Angirasa or the rays of the southern part of the sun work like Āditya rays :

(७) य अन्तः सूर्यमारोहयन् दिवि- प्राप्तिकं पृथिवी मातरं चि ।

कृि १०१५६५॥
i.e., who by means of \textit{Rita} made the sun rise to the world of heaven, and greatly expanding the mother earth.

\textbf{Prithivi attains its full size}—When the earth attained its full size, it was called, ‘the great’. \textit{A mantra} is very explicit to this effect:—

\begin{align*}
\text{यथैर्पृथिवी मही बाघारेमानु बनस्पतीन्।} \\
\text{वृक्षों १०२०१११।}
\end{align*}

i.e., As this earth, the great, bore these fruit trees.

\textbf{Note}—It is clear from the above \textit{mantra} that at that the time when the earth was able to bear trees, it was already fully expanded.

\textbf{Prithivi moving towards Mothership}—\textit{Prithivi} became great. She had to assume the duty of a mother. Four kinds of living beings had to be borne by her. Therefore, the word mother is used for her:—

\begin{align*}
\text{पृथिवी मातरं महीम्। तैः भाइं २१४१६३।}
\end{align*}

i.e., Prithivi, the great or the present earth [which had become] the mother.

This much will suffice. More has already been written in this connection in Chapter XVIII, while dealing with the expansion of heaven and earth.

\textbf{Third Creation—Shuṣkāpa}

After the clay-state appears the state when the watery tinge in the clay was drying. \textit{Shuṣkāpa} means, ‘when the waters have dried up.’ The \textit{darbha} or \textit{Kusha} grass (saccharum cyndricum ?), according to \textit{Maitrāyani samhitā} is a specimen of this type. I have not been able to grasp its significance. However, this is clear that the muddy clay-like state was dis-

\footnote{1. Cf Shat. Br. VII 2.3.2, “these \textit{darbha} plants are both kinds of food, for they are both \textit{Apah}-waters and annual plants. Now the waters which, loathing \textit{Vṛitra}, rose up on the desert land became those \textit{darbhās}.}
appearing. It is certain that there was a time when the earth was muddy or slippery. Yajurveda contains the following mantra:—

अथवासीति पिनिकिलिका। यजुः २३।२॥
i.e., This earth was slippery.

That condition ended after the upper surface of the earth dried up.

Fourth Creation—usaha=Saline Earth

The appearance of saline patches on the earth is of a late origin. These saline patches are due to the action of the heavenly world. This will be understood from the following three passages:—

(क) उषान् निविधति।।।चावापृष्ठिवी सहास्ताम्। ते वियती वर्षौ.-
लाम्। अस्तेव नौ सहु यशविमति। यद्रुव्या यशविसीतृ तदस्यामद्वात्।
त ऊषा अभेव। यद्र्या वशियमासीतृ तदमुच्यामद्वात्—तददश्रयद्रमसि
कृष्ट्याम्। उषान् निविधति दवापेली११२॥
i.e., [While Establishing the Sacred Fires] he places the saline earth......Heaven and earth were together: while separating they said, 'let our sacrificial share be together'. That which was the sacrificial share of heaven that was placed in the earth. Those became the saline particles. That which was the sacrificial share of this [earth], that was placed in yonder [world]. That is the black in the moon there. [Hence,] while placing the saline particles of earth, he should meditate upon heaven.

Note—When the above thing took effect, the earth must have expanded to some extent. The moon must have been still near it though not quite within touch. Then alone was it possible that an upheaval from the earth could pass on into the moon. And at that time certain rays of the sun also must have effected certain portions of the earth. At that period the sun was not as hot as it is now.

Again how much portion of the earth passed on into the moon? How it actually happened? How much weight the
moon gained, and how much the earth lost? What were the effects of these happenings on their rotations, are all questions which require scientific solutions. I am not yet in a position to answer all these points.

Another text also touches this action:—

(क) यदा इने क्षेत्रां यद्युग्मया गशिष्यमांसीतः तदीस्माद्य श्रङ्गुलसृज्ज्यते, अः ।
यद्युग्मा भवन्यनयोगनेव यशिष्यभाष्टः। प्राजापत्या वा अः: । श्वशस्तो भूस्यांसो भवस्ति । काठो सों प। ॥

i.e., When these two [the heaven and earth] were going apart, [then], what was the sacrificial share of heaven, that was sent towards the earth. It is the saline part. These saline particles, place the sacrificial share of these two. These saline particles pertain to Prajāpati. Hence these increase more and more every next day.

The above text is met with in Kapśīghala Samhitā VI, 7, also with slight variants. How a salt soil converts fertile soil into an unfertile one is well known. The salt soil attracts certain particles from the atmosphere and those coming into contact with good soil might be causing it to become unfertile. The atmospheric particles are of various kinds and are called pashus in Vedic terminology. I have given a lengthy account of these pashus in my book, 'Veda Vidyā Nidarshana'. These pashus originate in the mid-region.

(ग) असः हृ वै चौरस्वय पूर्विभ्या पालां पशुन प्रददं । तस्माद् पशु-
व्ययमूलपरमाहुः। ...समुद्र मात्रात् प्राष्यां पूर्विभ्यां प्रतिपिठात्: । तमनयो-
स्वापृविधो रसं भवते । सों भः ॥ २१।१।१६।

i.e., Yonder heaven, certainly, bestowed these salt particles (pashus, ordinarily translated as cattle) on this earth: hence they say that salt soil is suitable for cattle...And these [salt particles] having come from yonder [heaven] are well placed on this earth. That [salt] is regarded to be the savour of these two, heaven and earth.

An almost identical idea about these salt particles is expressed in another way in the Jaimini Brāhmaṇa:—
कथानूँ एवासामुर्द्वं सत्यं शुल्कम् अग्निरोह धूसमु दत्ता इत्यादि भ्रमुप्यः।

जैन । ब्रा० ११४४॥

i.e., The heaven accepted the salt particles as the purchase price from the yonder world; and the earth from here steam (or water vapours) for the yonder [sun].

Note—These are water vapours which assume different forms and reach the sun through the mid-region paths.

Modern View—Chemists of the present day, consider salt soils as containing sodium nitrate or potassium nitrate. Ordinary salt also contains sodium.

Salts rich in Agnih Paramāṇus—Caraka samhitā (3000 B. V.) says:—

सलिलामिथरियिन्यकाल्लवंशः। सूत्तस्थान, २६४०॥

i.e., Salts have abundance of Agnih and water paramāṇus.

This again is the opinion of Nāgārjuna and Sushruta (Sessortis of Egypt):—

कृठ—ब्रम्ल—तवः—भ्रातेयः। सूत्तस्थान, ४२१॥

And the same observation is supported by the Sāmkhya Dīpikā:—

दाहकल्वं क्षारोल्लति। सांख्यदीपिका, प० १४२॥

i.e., On account of the property of burning, the Agnih paramāṇus give birth to salts.

This fact is already mentioned on p. 39, article 3 above, In footnote 1 of p. 18 above, the view of Padmapāda, a recent writer, is also quoted. This view requires verification. How the sun causes the creation of salt soils, is a matter for further research.

Fifth Creation—Śikṭā-Silica

The following statements will be helpful to understand the conception of this creation:—
1. स [युत] प्रतम्यत् सा सिकता प्रयुक्तः । या या ६।१।१३।१४॥

i.e., That clay was heated, it produced sand.

2. एष वा प्राप्ति वैश्वनरो यदसा ब्राह्मण्यः । स यदृ इत्य ब्राह्मणस्य तस्मैतदः क्षम यत् सिक्तः । मै० सो १।६।१३॥

i.e., It is, verily, this Agni Vaishvanara, which is the yonder sun. The sun, when it was here (near this earth), it is the ash of the sun which is sand.

Note—Sand is found at great depths of the earth. How the Vaishvanara Agni of the sun effected those parts of the earth should also be ascertained.

3. चरणाल इह हि सिक्तः । अमसेवां एतदृ वैश्वानरस्य भर्षम यत् सिक्तः । या या ३।१।१३।१६॥

i.e., The sand particles, verily, are just shining like. It is certainly the ash of Agni Vaishvanara, which is sand.

4. अमसेवां एतदृ वैश्वानरस्य रेतो यत् सिक्तः । या या ७।१।१३।१०॥

i.e., Sand is nothing else than the seed (semen) of Agni Vaishvanara.

5. Another expression is found in this connection:—

इष्टका वा एता वैश्वानरी:—अपरिमिता यत् सिक्तः । कपिलः सो ३।१।१३॥

i.e., These are, indeed, [fine] bricks, of the Vaishvanara Agni, innumerable, which are the sand particles.

Ash and Seed—Why the two words bhasma and retas are used for one and the same result of Agni. I think there is a difference between the actions of Agni. This should be traced.

Sand exists in two colours—The same Brähmana observes:—

हे हि सिकते, खुच्चा च इम्म्च्चा च । या या ७।१।१३।१४॥
i.e., Sand is, certainly, of two kinds, the white and the black.

Āpah another ingredient of sand—So far I have mentioned clay and Vaishvānara Agni as the producers of sand. There is still a third substance, which takes part in this formation. It is Āpah:—

सिकता वा ब्रम्हां पुरीष्म | षय साटो भाँस्ते कालिज ॥

i.e., Sand, verily, is the sediment of Āpah-waters.

Of the two kinds of sand, the white has a greater number of Agni molecules in it, and the black has a greater number of Āpah ones.

Purest sand—Prof. Partington writes:—

"The purest form of sand are white ("Calais sand"); yellow sand is coloured by Ferric oxide much of which may be dissolved by boiling with HCL." (p.725)

The common formula of sand is SiO$_2$. Silicon pure is seldom found in nature in its pure form. It is always met in union with oxygen.

It is clear that Vaishvānara Agni assumes the form of oxygen; or the sediment of Āpah may be oxygen. I have not worked in this line, and my remarks are a mere suggestion so far.

Silica in Planets and Stars—The following observation found in many books is important. I reproduce it from Encyclopedia Britannica:—

"It (silica) has also been found as a constituent of various parts of planets and has been recognized in stars." (Vol.20, p.655)

Silica is found on the earth, because when the sun was near it, its heat changed a part of the clay into sand, and sand contains silica. Where from the planets got silica? Do the planets possess clay, and if so, of what type?
Silica’s Expansion—It is experienced that “Silica’s expansion with rise of temperature is very small.” The discovery of its cause will be interesting.

**Sixth Creation, Sharkarā-Pebbles**

After the creation of sand, pebbles came into existence. The seer says:

सिकताह्यः शक्करारुप प्रसुष्यत । शाः स्राः ६१५३४३।।

i.e., From the sand particles [he] created the pebble.

Indra’s action helped the sand particles to get converted into pebbles:

इत्यनस वृत्ताय वज्जः प्राहरूल । तस्य वा विश्वासः ग्रासस्त्वा: शक्करः प्रभवन् ।

मै० सू० १६१३।।

i.e., *Indra*, certainly, struck his thunderbolt against *Vritra*. The drops which came out, as if from the mouth, those became the pebbles.

**Note**—*Vajra*-thunderbolt is mainly constituted of the *paramāṇus* of *Āpah*. It is said:

शापो वजः । मै० सू० ४१७४।।

वजः वाश्वायः । शाः स्राः ६१५३४३।।

i.e., *Āpah* (water) is the thunderbolt:

This thunderbolt is nothing but hail pellets witnessed during a snow fall. These are formed on account of low temperature. What was the nature of the ‘drops’, is not clear to me. These drops converted the sand into pebbles.

In *Bhārata*, the pebbles are generally found under the surface of the earth at a depth of about two feet and further below. These are called *roda* in Panjābi dialect. Below the pebbles the soil is loose. The pebbles have strengthened the upper crust layer of the earth and consequently it is hard.

**Two kinds of the thunderbolt**—It is said that a thunderbolt is of two kinds:

THE EARTH AGAIN

हो वै वच्यः घोरो सन्यः शिवो सन्यः । सः शुकः सः घोरो य भाटः । स शिवः । मै । सं ॥ ॥

i.e., Two, indeed, are the thunderbolts. Terrible or violent is one, and kind is the other. That which is dry is terrible, that which is wet, is kind.

The two kinds require further clarification.

Another allied observation—The sage Tittiri interprets it at length :

इन्द्रो वृट्ताय बच्य । ग्रहः खंडः । भुक्कः यथाभिपत्तिः । रुपस्वरूपकं रुपस्वरूपकं युपस्वरूपकं । ये संतः शरा श्रवणीयं वा । शरीरम् धारणां । ते ॥ सं ॥ ॥

i.e., Indra struck the thunderbolt against Vritra. It broke up into three parts. A third part was a weapon like a sword, another third part was the chariot, and still another third part was a sacrificial pillar. The inner śaras which disjoined, became the pebbles.

Note—The over mystic language, here, is at present foreign to me. How a hail pellet breaks up into so many different parts, is a problem?

The lower part of the sacrificial pillar or yūpa reminds of how the earth was made firm. It is noted in another place:

पृथिवीमूल स्वरूपैः । भ्रह्म हस्तिदेव । श्राव ॥ सं ॥ ॥

i.e., With thy lower part thou hast made firm the earth.

Sharpness in Pebbles—Kāthaka samhitā says :

तेजो वा श्रवण श्रवणां श्रवणां श्रवणां । काल सं ॥

i.e., They placed sharpness or energy in Agniḥ. These are the pebbles.

Loose Earth Made Firm—I have already noted the fact on p. 133-135 that at first the earth was loose. Later on, after the appearance of the pebbles, it became firm. The importance of the pebble-stage is very great. The crust of the earth is due to these pebbles.

Seventh Creation—Aśmā = stone

It is noted in a Brāhmaṇa :

शरीरभास्मानम् । श्रवण: । तस्मात् शरीराः श्रवण श्रवणो भवति ।

श्राव ॥ सं ॥ ॥
i.e., From the pebbles [he created] the stone. Therefore the pebble finally, indeed, becomes a stone.

i.e., *Soma* is the sun; it creates the light rays of the sun, the lustre-giving rays and the rays, which cause the expansion of the earth.

The great seers noted the fact that when the sun expanded the earth, it did it by means of its rays. God *Varuṇa* also has rays. His action also appears to be with his rays. *Indra* with the help of the *Marutos* causes earthquakes. This must have helped in the expansion process. With this much knowledge the following *mantra* can be easily understood.

(1) स धा रयते पूर्विको प्रयच्छ । श्रृ ११० ३ २ १ २ २ १ ।।

i.e., He [*Indra*] held and spread wide the expanded earth.

_Vritra_*—Vritra or the great cloud, is remembered in this context also:

तत्त्व एतच्छवीरं यदू गिरेयो यदयमानः । श ० वर ० १४ १ १३ ।।

i.e., [*Soma*, forsooth, was *Vritra*]; his body is the same as the rocks and stones.

Note—How *Soma* or its part-transformation *Vritra* helped in the formation of rocks and stones is a matter for further research.

_Vritra_ is related to *Soma*, is certain. Cf:—

इति ये सोम श्रासिद् । श ० वर ० १४ १ १४ ।।

This fact is not understood now, but there was a time, when all this technique was fully known to the students of Veda.

**EIGHTH CREATION—AYAH AND HIRANYA IRON, COPPER, ETC. AND GOLD**

The *Brāhmaṇa* carries on its vivid description:

_प्रस्मोऽस्यः_ तस्मातन्यमोऽर्थमि_ ग्रयस्यो हिरण्यम्_ तस्मादयो बहुमात्रं हिरण्यसंकाशामिवेय भवति । श ० वर ० ६ १ १ १ ।।


i.e., From the stone (or ore) [he produced] iron. Therefore from stone or ore they smelted iron; from iron gold; therefore iron much smelted becomes, as it were, to have the appearance of gold.

**Note**—Modern archaeologists have coined a history of iron, in order to suit their purpose of a coined history of the world. They assume the discovery of iron in about 1700 B.C. The above cited Brāhmaṇa work was taught long before this assumed date, i.e., in 3200 B.C. Therefore a coined history, based on mere assumptions, is no history and is worthless in deciding dates.

**Eight Kinds of Iron-Class Metals**—The word _ayāh_ in Sanskrit is generally used for iron. Another word _loha_ is also used for it. But _loha_ represents eight sub-classes. It is observed :

> अष्टी लोहानि चबते । अभिधानविन्तामयिष्ठ ॥ १०५॥
> i.e., Eight metals are called as _loha_.

Abound in _Agnih paramāṇus_—All these iron-class metals are _taljasa_, i.e., those which abound in _Agnih paramāṇus_.

> सर्व च तैजसं लोहम् । अभिव्र चित ॥ १०५॥
> i.e., All loha-class metals are _taljasa_.

**Reiteration of a Vedic Truth**—It is often repeated in Vedic texts that gold etc. are _taljasa_:

> एवं तो सम्ब: प्रयात तनुवं दूरसं, तेजो हिंरक्षम । मेवो सं ॥ १०५॥
> i.e., This is a dear body of _Agnih_, which is clarified butter, and the lustre of _Agnih paramāṇus_ is in gold.

**Metal Classification**—The classification of metals according to their chief _paramāṇu_ constituents is found only in Bhāratiya works. The _Vaiśeṣika sūtra_ of _Kaṇḍa_ also alludes to this classification. Accordingly it enumerates (II, 1.7) tin, lead, iron, silver and gold etc. as _taljasa_ metals.

_Taittirīya saṁhitā_ IV.7.5 and _Kapiṣṭhala saṁhitā_ XXVIII. 10 use the two words _ayāh_ and _loha_ in one and the same passage, indicating thereby, a minute difference between the two.

**Mahābhārata follows Śatapatha**—As regards the birth of iron, the sage _Vyāsa_ says :

>
THE STORY OF CREATION

iadmano lohagunyaspitam | shatiparv 51.24.

i.e., Iron came out of stone.

Original source, Manu—In reality Šatapatha and Mahábhárata, both follow Manu IX. 321. This shows that the birth of iron from the ore was discovered long long ago.

Vyāsa clarifies—Vyāsa throws a subtler hint about the birth of iron:

vāltā gradhāyānas tasya | varnapar 224 95.

i.e., From the vāta-affecting molecules of Atharvā Agniḥ iron came into existence.

Note—What are these vāta-kind of molecules of Atharvā Agniḥ, and how are they to be differentiated from its other molecules are matters, quite unknown to me for the present.

Base metals—Ayah or iron, and copper, lead etc. are all termed base metals. Agniḥ in union with Āpah created an embryo. The impure part of this embryo was the cause of the birth of base metals. It is said:

yad garbhasya saman ladv dhvarṣam | kṣaṭṭalam 71.14. kātaksan 51.11

Base metals turn into gold under changed conditions. It is said:

dhvarṣa hiḥṛṇyamabhita | hāo ṛa 2124.

i.e., A base metal became gold.

BIRTH OF HIRANYA=GOLD

After iron, the Brāhmaṇa work points to the birth of gold. This matter is stated nicely and at length in the Atharvaveda.

Triple birth of gold—Atharva veda records the following truth about the birth of gold:

vēsha jātān jānmaned hiḥṛṇyaḥ, prānēreṇkā śriyamān bhūv, soṣṭvāṁk hiśkṣitām parapataḥ | prāpacēṃ vētasāṁ rete āhaḥ, tatu te hiḥṛṇya śrivardastāṇyaḥ. 11

śravīved 51.28.16.11

i.e., Triply born by birth [is] this gold: From [the paramāṇus of ] Agniḥ [is] one, it became the dearest; one fell away [on the earth] from Soma when it was hurt; one they call
the seed of virtuous and brave Āpah [water molecules]; let that triple gold be for your long life.

Note—Gold born of Agniḥ paramāṇus is regarded as the best. Next we have to consider, how Soma was hurt, and how gold fell away from it? Its answer should be found out. The structure of the vedhas or virtuous and brave Āpah also requires study. Gold, when worn, or used in the form of a medicine, bestows long life is well known, and the fact is mentioned at many other places. Last of all we should know, whether the three forms of gold always remain separate or are some times mixed into one.

Manu states—The birth of gold from Agniḥ and Āpah paramāṇus, is stated by Manu also:—

 Antarābhāṣṇḥ संयोगान्तम् रोप्य च निर्भिभीं। १११३॥

i.e., From the union of Āpah & Agniḥ molecules do appear the glittering gold and silver.

Śatapatha further explains—The observation of Manu is repeated in the Śatapatha Br. :—

प्रतिन्हो वायुḥस्थियोऽन्तः समानतेः स्वाभित। ताैः सम्बन्धै। तासु रेखः प्रासिद्धचतुैः तदृहो हि सत्यमहः। तस्माद एतदिनिसंकाशं। भ्रमनेहिः रेखः। तस्मादेन्त्रं विन्ध्यति। अयुः हि प्रासिद्धचतुैः २० ब्राह २११३॥

i.e., Agniḥ, verily, looked with love at the waters, ‘May I pair with them.’ He came together with them. He discharged his seed in those waters. This seed became gold. On that account this gold shines like Agniḥ; it being Agni’s seed. Therefore it is found in waters (=streams.) In waters, verily, he discharged.

Tittiri proclaims—The sage Tittiri (3200 B. V.) expresses the above idea in a different language :—

तस्य [प्रभुः] रेखः परापततैः। तदृहो हि सत्यमहः। दैशो ब्राह २११३॥

i.e., The seed of Agniḥ fell away. It became gold.

Retas—What is this seed of Agniḥ? The world retas=seed is often used in connection with Āpah also. The exact molecular structure behind this word should be grasped.

Whitish gold—The birth of whitish gold is alluded to in the Taittiriya samhitā I. 5. 1. After explaining, how Agniḥ paramāṇus got transformed into rudra molecules, it is said that :—
That which was laid in the form of tears, that became whitish gold. Hence whitish gold is not meant as sacrificial fee. It is born of tears.

**Note**—During the course of creation, the story of these tears of Agnih, is an independent chapter in itself. As against whitish, gold is *harita* or yellowish also.

**Yellowish gold**—It is said:—

\[ \text{वरुणो वरुणीरस्मकामयत्} \quad \text{िाः समवति́} \quad \text{यद्भेदे श्रेष्ठ सक्षमत् तद् हुः हृतमवत्} \quad \text{यदयां तद्रजत्तम्} \quad \text{कपिलें सं ७४} \]

i.e., Agnih was desired by the waters. Waters are called *Varuṇāni*. These came together. The seed which was discharged by *Agnih*, became yellowish [gold.] = [The seed] that was of waters became whitish [gold.]

**Gold and the Mid-region**—As the earthy animals and human beings, get the assistance of the *pāṇus* and *noras* of the mid-region, in their birth, so also gold was originally a result of chemical actions which took place in the mid-region, and later on, after coming into contact with the earth, produced gold.

**Veda proclaims**—In a hymn pertaining to *Sindhu*, a river of the mid-region, which has a definite relation with the sun, *sadane vivasvataḥ*\(^1\)=in the house of the sun, this *Sindhu* is called *hīranya-yâtriṇi\(^2\)=golden. Similarly *Sarasvati* is *hīranyakartiṇi\(^3\)=of a golden chariot. It is well known in Vedic literature that *antarikṣa* or mid region abounds with *paramāṇus* and molecules of *Pāvaka Agniḥ* and *Āpah* so its streams and rivers are also rich in these substances. In this connection the following statement of the *Vāyu Purāṇa* is important.

**Vāyu purāṇa**—It records another fact:—

\[ \text{वं गमः सुदुःग्रामा पाश्चादि दीपतेःजस्मू} \quad \text{तदर्थ पवेते भयस्त हिरव्यं समपवत्} \]

1. Rigveda X. 75.1.
2. Rig. X. 75 8
3. Rig. VI. 61.7.
4. Quoted by Sarvananda on Amara 11. 9.95
i.e., The glittering embryo, which was given birth from the mid-region \textit{Agnih} molecules, by the celestial \textit{Gangā}, that became gold on the mountain of the earth.

\textbf{Note—Parts of \textit{Himālaya} are certainly rich in gold.}

\textbf{Sum-total of the above—The \textit{Mahābhārata} states:—}
\vspace{0.5em}

\begin{quote}
श्रविन्द्रमालम् चैव जातकमुदाहृतम्। अनुसारसंपन्नः \textsuperscript{13} 11=3.\textsuperscript{11}
\end{quote}

i.e., And \textit{Jātarūpa} gold is certainly an illustration of a union of \textit{Agnih} and \textit{Soma} molecules.

\textbf{Note—\textit{Soma} as I have already stated, is an essence of \textit{Āpah}. Therefore gold is a combination of \textit{Agnih} and \textit{Āpah} molecules. And \textit{Āpah} molecules, in the form of \textit{Soma} in gold, bestow long life, when it is used by human beings.}

\textbf{Further Evidence about \textit{Soma}—\textit{Taittirīya Br.} states:—}
\vspace{0.5em}

\begin{quote}
सोमस्य वा श्रविन्द्रमालम्य सिया तन्नुन्दरामभा तत्तुफळं हिरण्यमभवतू।
\end{quote}

\textsuperscript{13} 30=141714-3.\textsuperscript{11}

i.e., When \textit{Soma} was being pressed out, its dear body which sprung up, that became glittering gold.

\textbf{Ancient Chemistry—\textit{Rasārṇava tantra}—ocean of mercury (earlier than 2nd cent. \textit{Vikrama}), records:—}
\vspace{0.5em}

\begin{quote}
रस्सूल केताकर्ता चैव तोहसंकजर्तवः तथा।
\textit{तन्त्रोपपत्तिपुष्पणं} जाते हनुम नोपनमप्लते। 11316111
\end{quote}

i.e., Born of mercury, born of a mine or a stream\textsuperscript{1}, born of different metal ores, this triple is the birth of gold, a fourth is not found.

\textbf{Note—'Born of mercury.' This source of gold is also found stated in the \textit{Arthasastra} of \textit{Kauṭalya} (circa 1200 B.V.),}

\footnote{\textsuperscript{1} Some such streams or lakes are noted below:—}
\vspace{0.5em}

(क) तवस्य पादे महुद् \textit{दिव्य} \textit{पुम्म} \textit{कारवामवालुकम्}। \textit{रस्सूल} विन्दुसरी नाम। \textit{वामुरुरसारः}, \textsuperscript{41} 2311

(ख) तव जाम्बूनसद नाम, कनख \textit{देववृक्षम}। \textit{इन्द्रपोषकसंक्रमिन} \ जायते भास्वर तु ततु। \textit{वामुरुरसारः}, \textsuperscript{46} 31011

(ग) तव जाम्बूनसदी \textit{चुम्मा} \textit{वशवा} जाम्बूनसद \textit{पुरम्}। \textit{वामुरुरसारः}, \textsuperscript{47} 6111

(घ) \textit{वस्तुम्मा} \textit{नरिः}। \textit{वनपर्वे} 22142211
chapter 34, when counted from the beginning. Of the eight kinds of gold enumerated there, rasa-viddham, i.e., penetrated by means of mercury, or penetrated from mercury¹ is one. The ancient lexicon of Seṣa, as quoted by Hemacaandra, in his Abhidhāna cintāmaṇi IV. III, records many unknown names of gold; of these, two are:

Vaṁava and veṇubhaṭṭibham. These, when minutely studied, may throw important light on the sources of gold. Veṣu, a special type of bamboo, and bamboo in general is a rendezvous of Agniḥ paramāṇus. This will be seen under an account of the ninth creation. One thing about the statement of Rasāṛṣuva. It does not talk about the origin of gold in nature; it only states the sources of gold on this earth.

Modern Finding—It is strange that modern researches have fixed the atomic weight of gold as 197.2, and that of mercury as 200.61. When, therefore, gold is got from mercury how the atomic weight of mercury is slightly decreased and it gets converted into gold, is a matter for research.

Not an Element—According to the aforesaid accounts gold is constituted of Agniḥ, Āpah and Soma paramāṇus. It is not an element as the modern’s think, in the sense of a dhātu or a root. This observation of the seers cannot be easily set aside. It is the incapacity of a modern chemist that he cannot analyze it as yet.

AGNI—CAUSE OF METALS IN GENERAL

The Mahābhārata, a store house of ancient knowledge, preserves an account of how Agniḥ caused the birth of many metals. It says:

स तत्थ्रीरं संयज्ञ प्रतिभेष घरां तत्र ।
मूमि स्वत्तुभु अभिज्ञ धातुतृं ग्रहणं प्रभुगतिव हि । ॥ १३ ॥ वनपर्व २२४ ॥

i.e., Agniḥ, having abandoned that body [=arrangement of molecules], and then entered into the veins of the skin of the earth; and coming into contact with or touching the inner earth [molecules], it created metals of different kinds.

¹. Cf.—‘Today we can convert mercury into gold, but cost is very high.” Principles of Inorganic Chemistry, by N. D. Grover, Ambala, 1955. p. 3, note."
THE EARTH AGAIN

Note—The difference between the two words dharā and bhūmi should be noted. The next two verses of the above context indicate that the three humours of vāta, pitta and kapha, the results of the working of Agni molecules, and fully known to the science of Āyurveda, caused the difference of molecular arrangement in various metals. This difference of molecular arrangement became the foundation of the rasa or metallurgic system of medicine in the science of Āyurveda. It should be clearly understood that when the ancients talk of Āgni having ‘abandoned a body’, they definitely mean that the previous molecular arrangement was abandoned and a new one was adopted. The different bodies of Āgni are alluded to in many passages of the Vedic texts. Some of these are given below:

(क) एवा वा अर्भेनिरस्त्रत्वा तन्नृः। काठक सं १०१६।।
(ख) एवा वा अर्भने। प्रिया तन्नृः। सदाभ। काठक सं १०१५।।
(ग) स गोदित्वं लोकमुपावतते या श्रस्य यशस्वतन्व आसस्तामित्तकामै।
ता एता। वद्वाना पावकाशुचि। कविष्ठन्त सं १०१८।।
(घ) अर्भेनवी एता वैश्वानरस्त्रय यशस्वतस्वै। यशिनण्यः। कविष्ठन्त सं १०१५।।

The last quoted, authority conveys the idea that there is a special molecular arrangement of Āgni, which is found in the metals.

The principle of these different bodies is based on the arrangement of molecules. How, and under what circumstances it changes, is a deeper question? In future studies this will become a separate branch of knowledge. Another direction for future studies, is the mode of union of various kinds of molecular arrangements of Prithivi dhatu, with Agni’s molecules and causing the birth of different metals. The text of the Mahābhārata preserves many hints which throw light on this topic. But, for want of space, I have not dealt with them here.

BEFORE THE NINTH CREATION

The sun had gone high up from the vicinity of the earth. The formation of the intermediate region was taking place.
The condition of the earth at that period can be imagined to some extent from the following passages.

**Day alone**—The rotations of the planets were unsettled yet. And it was natural that when the sun was going up from the earth, it presented a uniform picture. Then it caused the phenomenon of day alone. Night was altogether missing. It will be clear from the following three passages:

(क) न वै दुरा-प्रहोरायें ग्रासतां। कपिंच्छल सङ्ख्या ३।१२।

*i.e.*, Formerly, day and night had no existence.

This depicts the earliest phase. After it came the next stage. It is said :

(ख) प्रह्वायें ग्रासीन रात्रि। कपिंच्छल सङ्ख्या ५।१६।

(ग) प्रह्वायें ताहि ग्रासीन रात्रि। मैौ सङ्ख्या १।१३।१२।

*i.e.*, Then it was day alone, and there was no night. The phenomenon of day and night is a late one. It will be explained subsequently.

**WET AND BALD EARTH**

The earth was not yet fit for plant or animal life. As already written it was at first wet and loose. Slowly and slowly its upper skin slightly hardened. The next stage of the earth is depicted as bald. The following passages will help to understand that condition :

1. इवं वा प्रलोकमेवं ग्रासीतू। ऐ० ब्राह्मण २१।२२।

*i.e.*, This earth, certainly, was as if without hair.

2. काल्वाली कुत्ता हृयं ताहि पुष्पिभाष । मां शङ्क १।२१।४।

*i.e.*, As if made bald was, then, this earth.

3. ग्रह वै ताहि प्रलय पुष्पिभाषेद्विषादमा ग्राहं ग्राहं। ऐ० सङ्ख्या २१।१२।

*i.e.*, And, certainly, then the earth was small; plants were unborn.

4. रहस्य वा इयमलोक्मात्सस्तैः। ऐ० सङ्ख्या ७।४।१।
i.e., Void of life like a lunar mansion, certainly, this earth was like the body of men without hair.

5. ज्वः हा इयमप्रयाप्तातितु । तस्यं देवं रोक्षिण्यां ब्रूहिस्योऽरूप्सन् ।
   मैौः सं० २१५२॥

i.e., Void of life, verily, was this earth at first. The gods made grow creepers and shrubs etc. on it, during the time of the Rohini lunar mansion.

6. प्रथ बु इयं तस्यं ज्वः ज्वः स्ताराक्षायिता । ते सौजन्यं तस्मेकामायल-भागहै यथास्मानोशष्मद्वृत्त बन्यात्सत्त्वं जायत्ता हृति । मैौः सं० २१५२॥

i.e., And, verily, this earth was, then, barren, void of life, and without hair [on its body.] They [the gods] spoke, 'for that desire we perform a sacrifice, as plant life may be born on it'.

7. त इमे लोकं अभवम् ज्वः ज्वः ज्वः स्वस्तविन्यानः । तां ग्रोः सं० २१५२॥

i.e., These had become the [three] worlds, and they were dry, not fit to yield a livelihood.

8. This same idea is repeated in Jaim. Br.II. 244, with the reading rǐksā in place of rūksā of the above. The meaning is almost the same.

These authorities will suffice. The underlying idea is quite clear and natural.

Bible—The Bible has a similar statement; "the earth was without form and void. (Genesis I. 2.)

NINTH CREATION—PLANT LIFE

1. Gods worked, Agni—Gods or the various physical powers began their work. Rigveda says:—
   प्राचृताः दाति रोमा व्रृच्छिकः । भर० ११५२॥

i.e., Agnih bestows the hair of the earth.

2. Indra—Indra's part as related is given below:—
   इद्रस्त स्त्रं जग्नमेत इन्द्रयं बीयं युर्वबृवेशसमाश्चतु । तदोपथयो बीययो
   सभवन् । तौः सं० २१५३॥
i.e., When Indra desired to kill Vritra, the great cloud, his seed moved to the earth. That became the annual plants and the creepers etc.

3. Indra and Āpah—The Āpah of the intermediate region work:—

िद्रो वेद्रमहुः तातां वेद्रमहुः स्थितु अपहनुः। तातां यदृ यस्य स्वेद्रमासीयूः तदुद्दारामतू। तर सब्रोपुष्यो समबन्ध। तातां नाव एतलेनो यदृ दम्मः। एता वेद्रमहुः ग्रापः।

i.e., ‘We may perform the sacrifice.’ Indra, vertily, killed the great cloud in the midst of the Āpah of the intermediate region.] That part of those Āpah which was immaterial and pure, that sprang up. Those Āpah molecules became these annual plants. Of them, it was the lustrous part, which are the darbha grass. These verily are the dry Āpah.

4. इद्रो वेद्रमहुः। सो सीमो समबन्धित। तातां यन्मेथ्यः यस्य स्वेद्रमासीयूः तद्वोधरामतू। ते दम्मः स्वेद्रमासीयूः। तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा तैसो संसा

i.e., Indra killed the great cloud. It was dead in the Āpah [of the mid-region.] What was pure and sacrificial of those waters, that sprung up. Those became the darbha grass.

5. Soma—Soma’s part was the greatest. It is said:—

सोम वेद्रमहुः सुवर्ध्नुः स्थितु वस्नु वानस्यो यस्य स्वेद्रमासीयूः। तातां वेद्रमहुः।

i.e., Suparya or the vibrations of gāyatri and other metres3 stole and brought down king Soma, [from the heavenly world] and cut or split it, the saliva particles which fell, those, certainly became these annual plants. All plant life contains Soma portions in it.

6; Soma’s part again:—

1. (क) यदृ वायुः देववृक्षो मृदुः। ऐः ब्राहः ॐ।
   (ख) [चन्द्रवल्ल] सुपर्णुषपारिः मृदुः। ऐः ब्राहः ॐ।
THE EARTH AGAIN

देवो वै सोमो दिवि हि सोमो ब्रह्मो वै सोम भ्राती०। तस्येत्तैव रूपमें यहं
विश्वये यद्यमानः। तदेव-उपासनाय यथिते। इति हृ स्माहं श्वेतकेतुरीहुः-
लकि।।

i.e., God, verily, is Soma. In the heavenly region, verily, Soma [was.] The great cloud was Soma. His body
is the same as the slabs and the stones. On these stones
grows that annual plant called uṣā; this was said by Śveta
Ketu, the son of Uddālaka.

7. Soma's Eye—It is said :

वक्ष्यो हृ वै सोमस्य राज्यो । स्वीकार्य प्रतिविपेयता । तस्यायर्य प्रासक्तवः।
ततो यथा समभवतः। तस्मादाहुर्वश्यो यथा इति। श० ब्र० ४१२११११।।

i.e., Varuṇa, verily, struck king Soma right in the eye —
— A tear of his fell down; therefrom the barley sprung;
hence [the teachers] say that barley belongs to Varuṇa.

Note—It is a fact that barley is rich in Āpah element,
pertaining to Varuṇa. It is always used by medical
practitioners for increasing the passing of urine etc.

8. Draught of Soma—The exact significance of Soma-
pīthah-draught of Soma, is to be traced. It is said :

इन्द्रो वै तवच्छः। सोममु । श्रीविव । अनुपूर्ब्बमानः। तस्मोधयो सौमपीयो सपतु ।
ते द्वामाका श्रमवन्। मै० स० २१३११।।

i.e., Indra, verily, uninvited or not invoked, drank the
Soma of Tvāṣṭā. His draught of Soma fell up-wards;
those became the śyāmaka plants.

98. The same Somapitha—An almost similar incident of
this period is remembered :

यत्तीनौ वै सालाक्षेया भ्रात्रस्येशो श्रीविव्यर्य, परापतत्वं िर्योर श्रमवन्।
सामपीयः सपतु । ताति करीराः।।। काठक स० १११००।।

i.e., The Sālavrikas ate the yatis, Their heads fell, and
these became grapes. The draught of Soma, fell upwards;
those became the Karīra trees.
Note.—Yatis and Sālavrikas are to be traced in the mid-region. Many Vedic verses relate their stories. These should never be confused with the Yatis and Sālavrikas of ancient history.

10. Prajāpati also helped. It is said:—

यजास्य वै प्राम शिरो सविन्द्रित तस्य यो रसः प्राणेवर्तू त एवोत्तीका वर्मन्त्।

जै० ब्राह ११३७४।

i.e., Where the head of Prajāpati was cut, the juice which flowed from it, those became the utikā plants.

11. Another factor which helps in this direction is expressed in the following words:—

ब्रह्म वा इव लशी-सशालोमिकासीतु । तां देवा ब्रह्मवै कामायलमित्।
तवास्यं लोमानि-सरीरासतु । ततो वा इव लोमानि श्रुक्षातु । काठक सं० १२१३।

i.e., And, verily, this earth was then barren and without hair [on its skin.] The gods for the fulfilment of their desire made a sacrificed for Aditi. By means of her they made hair grow on the earth. From that time it possesses hair on it.

The Hair—It is very clearly stated in a Brāhmaṇa that plants are the hair:—

प्रोपिशवस्थतयो वै लोमानि । जै० ब्राह २१३४।

i.e., The annual plants and fruit trees are, certainly, the hair [on the earth.]

Urk—Source of Life

In the course of plant growth the study of Urk or Urj is very important.

Root-meaning—The great grammarian Pañini (circa 2800 B. V.) records the meaning of the root of this word as ‘the giver of strength and breath or life.’

Source and Nature of Urk—Urk is connected with Āpah and Agnih molecules. Its source and nature can be studied in the following passages:—

१. ऊर्काः ग्रामो रसः । कौमि ० ब्राह १२१४।
2. ऊर्जा क्षेत्र (यजुर् १.११०) में वुड़दादु उद्धरता जायते तथा तदां तदां।
शा ब्राह्म १.२८:१६:१०

3. प्राप्ते वा स्कूर्ता स्कूर्ता श्रव्यां श्रव्यां। शा ब्राह्म त १.२४:११.१०:१।

4. यद्वैतदेव मूर्त्वं श्रवणां व्यभिचारं तत्र उद्यमः समभवत्।
एवो ब्राह्म १.२४:१४

5. प्रजापतिदेवयां ऊर्जा व्यभिचारं तत्र उद्यमः समभवत्।
तौ ब्राह्म ३.१५:१.४

6. देवा यथों व्यभिचारं तत्र उद्यमः ज्ञातिष्ठत्। मै० सं १६:१.६:१६:१।

7. ऊर्जा उद्यमः। तै० ब्राह्म १.१६:१०:१।

8. तस्मात् स सर्वदा सर्वदा श्रव्यां। शा ब्राह्म ६.१६:१३:१।


1०. ऊर्जा प्रस्वयं पूर्वः हृति। अस्याम् ऊर्जम् प्रस्वयं। तस्मात् इसमा तत्रभिदु उपज्जीवित। मै० सं ७२:१६:१६:२।

1१. ये विभयों दिवों ये प्रविध्या समागच्छति-श्रव्यं ऊर्जं वसाना:।
मै० सं १६:१६:१३:६।

1२. केनिति देवा। [उपासने।] शा ब्राह्म १०:२८:१२:१२:१।

1३. विषये देवा यासून् मदगे। मै० ३:४३।१:१।

1४. इविरो विश्वव्यं चातो गर्भः तस्माओपमार्गसत्त्रो ऊर्जों नाम।
यजुर् १०:२४:१। मै० सं २२:१५:२:१।

1५. ऊर्जां पुर्णं भरतं सुग्रामदु देवा ब्रमिन्धारयं ब्रवियोगदाम।
शा १.६:१६:३:१।

1६. ऊर्जों नापत [ग्रन्थि:।] शा १०:२०:१०:१।

Translation of the Above

1. Urg, certainly, is the taste or essence of waters.
2. The taste or essence which is produced by the rains is ā́rg.

3. Āpāḥ or waters, verily, is ā́rf. Undoubtedly ā́rg is born of waters.

4. When the gods isolated (=separated) this īṣ and ā́rf, therefrom udumbara (ficus glomerata) was born.

5. Prajāōpati isolated the ā́rf for the gods, therefrom udumbara was born.

6. When the gods isolated the ā́rf, therefrom sprung up udumbara.

7. Ā́rg is udumbara.

8. Hence that (udumbara plant) is always moist, always full of milky sap.

9. Ā́rg, certainly, is munja (saccharum sara).

10. Bestowed ā́rf on the earth, i.e., held ā́rf in this earth. Hence life on earth depends on it.

11. The molecules of different Agniś, which come from the heavenly region, and from this earth, and unite, those hold īṣ and ā́rf in them.

12. Ā́rg is waited upon by the gods.

13. All gods enjoy ā́rf in the waters.

14. Agile=swift, all expansive or pervading, the wind is the gāndharva, that holds speech or electricity, and its electric fairies are the molecules of water, these are named ā́rf.

15. The gods hold Bharata Agni, the giver of wealth or prāṇa, and the son of ā́rf.

16. The grandson of ā́rf is a special kind of Agni.

It may be regarded as :

\[
\begin{align*}
\text{Urj} \\
\text{Bharata=an Agni} \\
\text{Urj—napāta}
\end{align*}
\]

**Definite Background**—A scientific mind, after reading the above statements, will at once come to the conclusion, that
there is a definite technique behind all of them. But, as observed already, it is a pity that no student of Vedic knowledge knows the exact significance of this technique. However, the following points will help us to understand the above in terms of modern science.

Ωṛj thus is:—
1. the source of breath or life,
2. the source of waters,
3. born of rain,
4. born of waters,
5. isolated or separated from īṣ,
6. found in abundance in the udumbara plant,
7. also found in the munja plant,
8. the cause of life on the earth,
9. brought to this earth, along with some Agnīḥ molecules from the heavenly region,
10. enjoyed by the gods,
11. enjoyed by the gods in waters,
12. the father of Bharata Agnīḥ, which is held by the gods,
13. swift, expansive, and is like electric fairies of water-molecules.

Identification with an 'element' of modern chemistry

In the absence of a clear conception of Vedic technique, I cannot identify this substance in an unambiguous manner with any of the substances discovered by modern science. Hence, I confine myself to state the properties of certain substances from a book of chemistry, which come nearest to Ωṛj. I have already said that properties help in this direction to a great extent.

Oxygen, occurrence—“Oxygen is the most abundant element on the earth. In the free state it is present in the atmosphere up to 23 per cent by weight. Water contains 89 per cent by weight of combined oxygen... Almost one half of the mass of the whole earth including the ocean and the atmosphere consists of oxygen.”

Properties—Slightly soluble in water; can be liquified at

1. Intermediate Inorganic Chemistry; Tuli, Bahl, Prasad; 1962, p. 188,
very low temperatures; non-combustible; a supporter of combustion.1

**Ozone**—It is a condensed form of oxygen, having the molecular formula O₃. Occurs in extremely small quantities in the atmosphere, specially near the sea-side.

**Properties**—Ozone has a strong characteristic odour. It is slightly soluble in water.

**Note**—I have chosen oxygen for the above purpose, because:

1. it is connected with our breathing;
2. it is born of water;
3. it is dear to the gods, and they often take the help of Agniḥ.

So, in the identification of āṛj, the nearest approach may be to oxygen. One thing may, however, be remembered. Future scientific research may reveal that oxygen is also a chemical combination of two, three or four Mahābhūtas.

**Cause of life on the earth**—I have already shown that the earth was bald at first. In course of time life appeared on it. Quotation no. 10, above clearly points out that life on earth depends on āṛj.2 This tempted me at times to relate āṛj to carbon, an important source of life. But “though an essential constituent of living matter”, it does not help breathing, and is, again, not born of water; so its consideration was finally discarded.

**Creation of Seeds**

Vedic seers are unanimous in proclaiming that plant life appeared on the earth through seeds. The great Vyāsa says:—

बीजमां गुरजुष्टमः। महाभाषो शान्तिपर्वं २६६॥१॥

i.e., Seed alone was created in the beginning.

And again:—

नाबीजज्ञायते किंचिदतः। शान्तिपर्वं २६६॥१॥

i.e., Nothing is born without a seed.

---

1. Ibid, p. 193.
Agniśeṣa and Caraka, the two medical authorities state:

नाइकुरोतपति:—अब्रवीजातुः...नान्यस्मादू बीजादु प्रायस्योतपति:।

सूत्रस्थानः, १११३२॥

i.e., A sprout is not born from a non-seed.¹...Nor from the seed of one species, is born another species.

Primordial Seed—These original seeds are termed as primordial or Āḍī seeds in Viṣṇu purāṇa II. 7.32.

Vṛitra's help—On pages 219-221 above, the different parts of the great cloud are mentioned, these helped in the formation of various seeds.

Seed=Semen—The original seed is nothing but some sort of semen. In what form it exists in nature and under what conditions it assumes the forms of different seeds is not yet clear to me.

Support from Manu—The above fact is supported by Manu. In Manu I. 8, in a similar context, the word bīja=seed has a variant reading for it. It is vīrya or semen.

Soma and Semen—Āpaḥ is the real source of all creation. The essence of this Āpaḥ was Soma. It pervades the mid-region:

एष [सोम] हृ वा बायुरूप्तवा स्न्तरित्यात्रोके सम्भ्रोजति। गोऽ ब्राह्मणो पूरो धर्मादिः॥

i.e., This Soma in the form of Vāyu shines in the mid-region.

सोमे वै रेतोधा। मै० सू। २१४॥
सोमे रेतो सृष्टादु। मै० ब्राह्मण १६१२॥
रेत: सोम:। कौऽ ब्राह्मण १६१४॥
रेतो वै सोम:। ब्राह्मण १६१२॥

i.e., Soma holds the semen [molecules].

The semen in different molecular arrangements got converted into different seeds.

Three places of this creation—The seed formation took place in three places. It is beautifully described in the text of Bhuvana-deva or Viṣvakarmā:

1. Manu, I. 46 states that all plants grow from seed or stalk. This second type of plant growth is naturally a later growth,
The seeds are born when the earth comes into contact with water. In water is the birth of all seeds. Some are again born in the mid-region, others in the low levels of sea shores, or at the base of the oceans, while still others come out of the earth. This is the threefold creation.

Four classes of wombs—The wombs of all living creatures and plants are of four main kinds. These are described below.

Three main classes of seeds—Not only were plant seeds created in the beginning, but the seeds of those born from an egg, and the seeds of those born from the outer skin of the embryo were also created. In truth there are only three kinds of seeds. The Upaniṣad records:—

i.e., Of the living creatures of the mid-region, and of this earth, of three kinds alone are the seeds. These are of those born from an egg, born of the outer skin of the embryo, and born after breaking the earth’s surface.

Note—As a plant seed is quite different from the earth’s surface, which it breaks and comes out, so also the seed of the animals is quite different from the outer skin of the embryo, from which it come out. In short the egg, the outer skin of the embryo and the earth merely serve as wombs. This will be quite clear from the following half verse:—

i.e., Even those born from the egg are born on account of the union of the discharge of the female and the seed or semen.
of the male. It is apparent that in the passage quoted above the word ‘seed’ is used for womb.

**Fourth class of living creatures**—The fourth class of living creatures is of the svedajas, i.e., of those, which are nourished by the sweat of the atmosphere, by the sweat of the earth, or by the sweat of living bodies, as well as on account of the union of cold and heat. These are flies, mosquitoes and bugs etc.

The eggs of flies etc., are not Ādī or seed-eggs; they are the result of the union of cold and heat and are nourished in perspiration. Whether their germs come from the atmosphere or from the earth is not clear?

**Earliest Creation of Annual plants**

Long long before the appearance of annual plants on this earth, and certainly even long before the birth of earth, and the planets, and also before the creation of Hiranāyagarbha or the golden germ, the birth of oṣadhīs or some sort of annual plants did take place in this universe. The *Rigveda* says:

\[ \text{या शोषणि: पृथ्व जाता देवस्यस् निमुग्ध पुरा। श्रृः रूः १०५७११।} \]

i.e., Those annual plants, which were born at first, three ages before the gods.

**Note**—These were in an extremely minute form; just like a tree in a seed.

The sense of the *mantra* is fully clarified by *Yajnavalkya*:

\[ \text{सुख्योपवविभवे जीवनं सब्देदिनिम।} \]

\[ \text{ततो ब्रह्मासमुस्वद हिरण्यायस्मुनुवम्। शास्तिपरं} \ १६१२.३।] \]

i.e., He creates the primordial annual plants, which are the very life of all living organisms; then he created *Brahmā*, who was born of the golden egg.

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1. *Ṣītāgarbhapostu* संप्रोगमण्यायते स्वेदजः प्रिचे। अनुपासनपर्व, २२४१५११।

The creatures of the fourth class and the causes of their birth are given at length in *Vayu purāṇa* 69.298-317.

2. Cf. Ludwig’s meaningless translation; “the herbs first come from the gods before the three ages.” Even Caland fails here; “The ancient herbs,” Shan, S’t. IX. 28.7.
Note—Brahma is the first god, and, therefore, it is plain that the oṣadhis were created before the gods.

Later creation of plant-seeds

The vision of the seers penetrated the depths of the vast knowledge of the universe, and they described the formation of the seed on the earth as well. Parāśara (earlier than 4000 B.V.), a teacher of the science of plants says:—

श्रावणः हि कलां दुःख्यि यत् पिण्डस्वानुक्तः।
तदेवे व्यूहान्तरवतु वीजस्मधिपिच्छिल।।
1. भीजोपतिकायकः।

i.e., Āpah or its subsequent transformation water, under the influence of pressure and temperature, assumes the form of a kalala. This mingled up kalala becomes a lump. This lump again undergoes a cellular arrangement and thus attains the form of a seed.

Note:—Kalala conveys the idea of a compressed state. Indu, a commentator of Aṣṭāṅga saṁgraha (sārīra 2), translates it as ‘somewhat hardened’. The embryos of the species of different living beings pass through the state of kalala. For example, the human embryo assumes at first this state after about 24 hrs, and the embryo of an elephant after seven nights.

Cellular arrangement—How the kalala state gets transformed into a state of cellular arrangement is also clearly stated:—

1. (क) कलालाभाज्यते पिण्डम्। अनुवासनपर्वः, २२०१.१५॥
(क्ष) श्रावणः एवं कल्लीभूतं भवति। पिण्डं तदा समआयते।

शारीरोपनिषद।

The technique of pinda is often used in such a context.

2. एकारात्रोचितं कलां भवति। गर्भ उपनिषद। श्रावणः सं. ५ शारीर, ३७।५
3. पालकायप्रक्षत हसि भायवेव, ३०१.२६; पु. ५४१६॥
4. शारावतिलक। शलोक २७, राष्ट्रभट्ट टीका, २०४१।
5. शारावतिलक, शलोक २७, राष्ट्रभट्ट टीका, २०४१।
i.e., The plants grow up after piercing the earth. The earth made wet by the waters, and baked by its inner heat, as also bestowed the cellular arrangement by Vāyu resorts to the cause of a seed.

Botany—Western science of botany begins this description with the stage of cells. The stage before the cell development process is not clearly mentioned there. On the other hand, the knowledge of cells is regarded as only 300 years old. This statement is almost funny. Another statement about the earliest stage of living beings is the following:—

“The earliest living organisms were nearly in the form of minute masses of protoplasm”.

The appearance of protoplasm is also at the cell stage.

Water in a seed—Another important but a very simple fact about a living seed is, that it only grows when it has some water in it. This water sets at work the rajas part of the seed, which shakes the equilibrium of other guṇas, and consequently provides opportunity for the soul to create a living organism. It is said:—

रजः प्रवर्तकं तत् बीजेश्वरीं वषा जलम्।
गुणप्रवर्त्तकमात्रं प्रसूतस्ते हाथिष्ठिता: ।वायु गुण ॥५।१॥१॥

i.e., The primordial cause of the universe begins to undergo a change under the effect of rajas, just as a seed begins to grow on account of water in it.

Water, main cause of plant growth—For plants, the factor of water is very important.

1. The Sāṁkhya teacher Pancaśikha says:—
बलभूमोः पारिपालिकं रसादिविशेषक्षणं स्वाभरेषु हृदत्तम् ।३ योगसूत्रः
अध्यासभाष्यः, ॥३॥१॥१॥

3. Another reading of the same:—
बलभूमोः—एतत् रसगन्धादिविशेषस्वयम्
श्रवक्षेत्र श्रावस्तिः स्वाभरार्काः ज्ञानमेव
ज्ञानान्तः स्वाभरेषु । माठर इति: ॥५॥१॥
Also cf.—सिद्धौपरिनिरस्तः, ज्ञात्वान्यस्यभाष्यः, पृ ४१६।
i.e., The result of a union of the molecules of water and earth, in the form of innumerable tastes is seen in the plant world.

2. *Vāyupurāṇa* records the simple truth:—

वे परस्ताद्वयं स्तोका भ्रावणा: पृथिवी तले।
ग्रामं भूमेश्च संयोगाद्र भ्रोष्यध्वस्तास्तु चाभवन्।।१३२।।

i.e., Those drops of water which come from the mid-region to the surface of the earth; in those, on account of their union with the earth, the annual plants grow.

3. The same truth is repeated in the *Mahābhārata*:—

तथा भूमेश्च स्तोका भ्रावणां भवन्तुद्विद्विवस्य।: प्रिये। भस्मासनवर्ष २२७।।१५।।

i.e., On account of the union of water and the earth the plant world comes into existence.

**Annual plants in all the three worlds**—Annual plants grow on the earth, but in some, yet unknown, form these exist in the remaining two worlds also. A *mantra* says:—

या शतारिखी दिविव य।: पृथिवीय ता नस्तुता भ्रोष्यभी: पारत्तु।

काठक सेते १६।।१३।।

i.e., The annual plants, which are in the mid-region, or in the heavenly world, or on the earth, those, when praised may take us across.

**Note**—It should be noted that the process of the praise of the annual plants is not a matter of discussion in this context.

**Brāhmaṇas Passages about Soma, Indra, Vritra and other dieties.**

These, almost enigmatical passages, have been quoted on pp. 219-222, in articles 2-10. Fortunate will be a future scientist who clarifies them. I can only add the following few points for the consideration of Vedic scholars.

**Article 2**—The seed of *Indra* requires a deep study. As already said in the words of the teacher *Durga* on p. 91, that “the electric light molecule (of the middle region) enveloped by the *Vāyu* molecules, is called Indra”; it becomes necessary to know, how this special union produces a seed, and how this seed, after its union with the wet earth, gives birth to a plant seed.
Article 3—An analysis of the constituents of the *darbha* plant, will certainly give a knowledge of the conception of dried waters.'

Article 5—It should be remembered that the molecular (or cellular) arrangement of the saliva particles or specks of *Soma* which was in the form of *vritra*, must have assumed various molecular arrangements, when the specks were split up or disintegrated.

Varuṇa and plant growth—*Varuṇa* also helped in this cause:—

(६) यदा वरुणेऽरत: सिन्धविति तवस्यां प्रति लिष्टिति । तत्त्र प्रजायेऽति ता होष्ट्यायो वीरुच्यो भविति । तैत संस ५५५।५।

i.e., *Āpah* [were] the wives of *Varuṇa*. [In those *Āpah*] he pours the seed; that rests in them. That grows and those become the annual plants and *virudhas*.

Brihaspati and plants—Some *mantras* say that the planet *Brihaspati* also gave birth to some annual plants. These come from the heavenly region in a germ-like state and grow on the earth. Rigveda X. 97. 19.

Besides the above passages, the following observations are also worthy of study:—

इन्द्रो वृत्रमहृद तस्य यो नस्त: सोमः सम्रामवुष्ट: तानिन ब्रह्मचुलान्युजुलानिति ।

i.e., *Indra* killed *Vritra*. The *Soma* which flowed out of *Vritra*’s nose, that became the brown-tufted *arjunas*; that which flowed out of his omentum, as it was cut out, became the red-tufted ones.

Colours in plants—The plant world is extremely rich in colours with their innumerable shades. The above passage indicates that the density of *Soma* cells is a probable cause of these colours.

*Vritra*—This great cloud, misrepresented as a great demon of the so-called pre-Vedic history, by Christian and Jew translators of the Vedic lore, is a physical phenomenon of the age, when heaven and earth were in proximity. Without this *vritra*, which had a great part of *Soma* molecules in it, the existense of plant life on the earth was impossible. When the heaven was being pushed up by the gods, the gods destroyed
this cloud in parts, and thus paved the way of plant growth on this earth. The original seeds of plants are due to this happening.

Perhaps the above passages may appear as dry study for many of my readers. But these do contain material for a deep probe. Hence I have tried to give a specimen of the ancient views on this point.

**Earliest Plants Never Dried up**

A very strange fact is further noted about these earliest plants. These being the result of Ūṛj, Soma and Āpaḥ etc. never dried up. At a later stage the entry of Agniḥ molecules into them took place, and these began to dry up. Modern science has not so far arrived at this conclusion. Links to reach at this truth should be searched. I reproduce the authority below:—

प्रजापतिव्‍हृदयः प्राचीनः। तं श्रीस्वरः ॐ्म्यरोहणः। प्रमुखः वा एता यदोधयः।
ता प्रविभित्तिपिघं। प्रविभिन्वं नाशकतोऽ॥ सो श्रीशलः। सो ॐ्म्यपलः।
ततो
श्रवण्यवणः। तमसं शुष्कं श्रीस्वरं तेजो स्वग्हवत्त। ता प्रमुख्यनः। न ततः पुरा
प्रमुख्यनः। मै० सं ११६।३६॥

i.e., Prajāpati was in the beginning. Long after, the vīrudhas grew. [At that time] the annual plants were void of Agniḥ molecules in the form of pṛāṇas. [Prajāpati] wanted to hurt them. He failed to hurt them. He shone. He underwent penance. Then was created Agniḥ, [Agniḥ molecules of a later form appeared.] To that Agniḥ, which was created, the glow of vīrudhas went. [Void of glow] the plants dried up. Before that time the plants did not become dry.

This long passage is worthy of a serious study.
CHAPTER XXIII

PLACING OF AGNIH ON THE EARTH

1. Absence of Agnih—At first Agnih molecules were not present on this earth in a state of union in which these were found later on.

2. Agnih Created—These were made to unite and laid down on the earth by Prajāpati. The mode of this process is briefly described below:

अग्रं प्रजापति: प्रजा अघुजत । ता प्रज्ञे तमसी-मौल्लोकां प्रज्ञनवेव   | सो शोषत । सो कर्प्यत । ततो स्मिन्निमुख्यत ।
मै० स० १६१६॥

i.e., Uncreated or not with molecules in union, certainly was Agnih. Now, Prajāpati created the subjects. These, in pitch darkness, were lost in these worlds. He shone. He underwent penance. Then Agnih was created.

3. Blowing of Agnih molecules—When Agnih appeared on the earth, all its properties, were not quite apparent. These became apparent subsequently. It is said:

प्रजापति: पवमानांमाण्या उपाधयत । मै० स० १६१६॥

i.e., After the creation of Agnih, in the beginning Prajāpati, blew it with pavamāna=soma.

Note—The meaning of pavamāna appears to be Soma. In Vedic works pavamāna is the Agnih which pertains to this world, as opposed to the two Agnīs pāvaka and śuci which belong to the middle and heavenly regions respectively.

4. Agnih enters into the Earth—The Agnih paramāṇus slowly and slowly began to enter into the earth. A mantra says:

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1. Gods are the subjects of Prajāpati. Planets and stars etc. are also his subjects. Cf:

प्रजापति: प्रजा अघुजत । स वा अभिमेइः समयस्त्रूत ।
मै० स० १६११॥
i.e., The *Agniḥ* molecules, mixed up with sand particles, later on entered into the earth.

5. Mode of this entry—Sage *Tittiri* clearly records this process:

*प्रभुप्रभुवेष्यः निलायतः सः पृथिवीवर्गः प्रविष्टः तैः व्रातः २१६१३१४। तुः कपिः ४०। दौ।* ।

i.e., *Agniḥ* concealed himself from the gods; assuming the form of a mole he entered into the earth.

Note—*Agniḥ paramāṇus* must have given some special arrangements to its molecules. These assumed a trend downwards, and thus gathered in the core of the earth.

The mole form is figuratively described. It is closely associated with *rudra*, another form of *Agniḥ*.

*व्रातः ब्रह्मचर्यः पशुः। व्रातः ब्रातः २१६१३१४।* ।

i.e., Mole is the animal of *Rudra*.

6. Burning *Agniḥ*—By this time the *Agniḥ* molecules had passed into the stage of burning. In this form these are placed in the interior of the earth. *Veda* says:

*रमिन्द्रो श्राविनिहितः पृथिवीवामः। व्रातः २१३१५।* ।

i.e., Ignited, kindled, or burning *Agniḥ* is deposited in the core of the earth.

Note—The adjective ‘burning’ shows that the seers knew the simple molecular or unburning state of *Agniḥ* as well. The idea of the core of earth will be evident from the following quotations.

1. Sage *Tandin* says:

*श्रामिनी पृथिवीः। तातः ब्रातः ४०। ५०।* ।

i.e., The earth possesses *Agniḥ paramāṇus* in it.

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1. पृथिवीः—सिक्तता सामिक्षः। सामायः व्रातः ३१। २२४।।

The *Angira* rays performed this action.
2. Jaimini says:—

ब्राह्मणों स्वयं लोकः। जै० द० १३७७॥

i.e., This world is of Agniḥ.

3. Gopatha Br. states:—

पृथ्वियामे पतली। गौरा द० २१६॥

i.e., Earth is the wife of Agniḥ.

4. Śatapatha Br. teaches:—

आभिनग्मि पृथिवी। बाहो द० १४०५॥४॥२॥

i.e., The earth has Agniḥ in its embryo.

5. Yajurveda says:—

माता पुत्रं यथोपस्ये सागिनं विमलं गर्भं ब्रह्म। यजुर० १५३॥

i.e., As a mother bears her son in her lap, so may [the earth] bear Agniḥ in her womb.

Bhrigus deposited this Agniḥ—This Agniḥ was not present in the interior of the earth at first. Its placing there was a later occurrence. It was placed there by the Bhrigus. This truth was seen by the sage Dirghatama and is recorded in the Rigveda:—

गमेरिरे भूमयो विवर्जयं स्वाभा पृथिव्याम् । भूततयं स्वाधम् ॥

श्रीमिं ते नौद्विष्टिः स्वं ग्रा वने ॥ क्ष० १५४॥

i.e., Agniḥ who is the source of all wealth, him, the Bhrigus placed from all sides in the navel of the earth, with the strength of the bhūtas. That Agniḥ you should obtain with praises in your own home.

Note—That Agniḥ should be known to the learned, along with its properties and actions. Bhrigus are the rays of the sun.

Threefold Earth—The ancients noticed the three different layers of the earth. They say:—

चिर्दश कृत् हृ-द्वयम् [पृथिवीं। गौरा द० ६५॥५॥२॥

i.e., Threefold, certainly, is this earth.

1. नामा पृथिव्या। कृत् ३२६॥
The nature of the threefolds is explained in another text:—

स्मिना, पृथिव्या, भोजविभि:—सणायं भोजविभि: निबद्ध।

ततो श्रातः ॥ १0॥

i.e., By means of the Agnih paramāṇus [in the interior region], by means of the [porous] earth [around it]; and by means of the plants [in the skin]; in this way, this world is threefold.

Note—The late Dr. W. Caland, having no idea of the Agnih paramāṇus, translates, "through fire." This is not a cogent translation. The word "fire" spoils the whole scientific trend and produces a wrong picture of Vedic science.

Modern conception—It is strange that the modern geologists have also accepted the threefold nature of the earth. According to them the nābhl is the ‘core’, porous earth is the ‘mantle’, and the region occupied by the annual plants or the tvak—skin portion of the earth, is its ‘crust’.

Avoidance of Excessive Heat

Agnih paramāṇus began to create heat. The earth feared, lest it be over-heated. Life would, then, have been impossible on it. Excessive heat was, however, withheld. How was it achieved, is also explained:—

1. प्रजापतिरस्त्रस्त्रामणीकृतः स पृथिव्यवहनानि मय्यिस्यं वैष्णवीस्ति मा भक्ष्यति। सा तवति ददामाना विविष्यते, स पापीयानुं भविष्यति। सी महावी—तथा या करिष्यामि यथा तथा नातिविष्यति। स इत्समयलक्ष्मी—प्रजापतिस्त्रुत सादेयुं तथा वेतविचर्जुः सरस्वत ध्रुवासिद्धे, इतीममेर्जुकाः कृत्वेपध्रसत्—अनति दाहाय। ॥१०॥

i.e., Prajāpati desired to lay the layers of Agnih paramāṇus and molecules (in the earth). To him, the earth said, you should not lay layers in me. [The Agnih molecules in layers] will over-burn me. That I, being overburnt, will tremble and move.¹ That you will become sinful. He [Prajāpati] spoke,

¹ "The molecules of every material body at normal temperature are in a state of permanent motion; and the faster they move, hotter the body seems." (The Birth and Death of the Sun, p. 19.) The earth would have trembled unceasingly at that time, had not a great mass of Agnih molecules passed on into the plants of the earth.
I, verily, will do that, by which [Agniḥ] will not over-burn you. He [Prajāpati] touched this [earth] on all sides, with the mantra “May Prajāpati place thee, along with that god, like Angrā sit thou firm.” With this mantra, placing the brick, He [Prajāpati] laid the layer of Agniḥ, to avoid over-burning.

Note—Over-heat causes an enhanced trembling of molecules of Agniḥ, and consequently, the earth with those molecules would have trembled very much. This fear of her was removed by Prajāpati in a way which we should try to understand.

2. इस्य वा अन्नेरति दाहादविभेयः। सेहता भ्रशस्य भ्रवित्वद्। ता उपाषद।
ततो वा इस्मान नात्यवहुः, यद्वशस्य उपदासति। तैं सं ५।१२।१०॥ तुलसी कपिल सं ६।११॥

i.e., the earth, certainly, feared from the over-burning heat of the Agniḥ molecules. She saw these [bricks] named Apasyās. Those [bricks, in the form of layers of Agniḥ molecules] were laid. On that account or from that time [Agniḥ] did not over-burn it. To represent that the sacrificer lays the Apasyā [bricks.]

Note—Agniḥ molecules, no doubt, heated the earth but the earth only feared from their excessive heat. That excessive heat was lessened by the layers of Apasyās. We know today, that the inner heat of the earth increases every layer we go down.

Kapiṣṭhala Text—The text of the Kapiṣṭhala samhitā further clarifies this point. According to it the Apasyās transform or bring to deterioration the effect of the heat of Agniḥ molecules arranged in the earth.

ब्रजनेनेद योनि: विकिष्ठते। कपिल सं ३।११॥

i.e., The repository or the birth place of Agniḥ molecules is transformed, [by the Apasyās.]

Root meaning of Apasyā—The root meaning of this word is, which is “watery”, which is “melting” and which is “dispersing”. All these three conditions save the earth from over-burning.
i.e., This earth, certainly, feared from the over-burning heat of the Agniḥ molecules. She saw this double property, [of its being] ploughed and unploughed. On that account [Agniḥ] did not over-burn it, as it, becomes ploughed and unploughed. [This is] to avoid its over-burning.

Note—When the land is ploughed, the dispersion of the earth particles takes place. It helps to remove the effects of over-burning.

i.e., This [earth] feared that Agniḥ would over-burn me. As [he] ploughs it, it is for a double property. [This is] to avoid its over-burning.

Note—Double property. The earth loses heat particles and the, plants receive the Agniḥ paramāṇus.

Cohesion of Agniḥ molecules differs—I have already said that Agniḥ exists in different forms. This difference is of various kinds. One is due to the difference in cohesion of its molecules. This can be seen from the following mantra:—

Agniḥ paramāṇus

i.e., Agniḥ molecules move, having entered in other Agniḥ molecules.

Whitney’s Trans.—W. D. Whitney translates this mantra as—“Agni moves (car), entered into the fire”.

This translation does not give even a crude idea of what the mantra expresses.

When the seers declare that there were layers of Agniḥ laid on this earth, they definitely understood the difference in the composition of those layers. This difference of composition is due to the difference in the molecular arrangement of Agniḥ.

1. cf. Śrāvyasū, ४१२१६॥
Modern view—That the interior of the earth is extremely hot is well known in modern geological science. A modern scientist writes:—

"At a depth of 30 miles, the temperature would be about 1500° F."

It is believed that this temperature rises the deeper we go. So the modern idea is not a new one. Its only difference with the old truth lies in the fact that the ancients believed in the gradual development of the earth from the Āpaḥ state to the present one, while the modern scientists have supposed that the earth has assumed the present form from a previous gaseous burning state.

Agnih enters into the plants and trees—It has been written above that plant life on this earth has saved it from the harmful effects of being over hot. How it happened is further explained? A sufficient quantity of Agnih molecules, instead of going deep into the earth, found their way into the plants, which were till then void of their presence. Some of the related observations are noted below. The Mahābhārata states:—

a (क) अभिनिवर्गतो यहद्द भि ने दारो न हस्येत्। शालिकर्षाय ११२॥ ॥

i.e., Agnih molecules, which have gone into a wood, are not seen, when it is cut into pieces.

This shows that it was a common knowledge in those days that Agnih molecules have entered into the plants. Rigveda also explains it:—

(ल) पृष्टो दिव्यि पृष्टो अभिन: पृष्ट्यम् पृष्ट्यो विश्वा ्भोधीरारविशेष।
 वेदान्त: सहस्ता पृष्ट्यो अभिन:। श्रो १।१५॥ ॥ याजु: १५॥ ॥ श्री॥ १६॥ ॥

i.e., Sought after in the heavenly region, sought after in the earth, the molecular arrangement of Agnih, and sought after, it entered into all the plant-world. This Vaiśvānara Agnih sought after with vigour.

Note—Eggeling—"sought after on earth", Sat. Br. IX, 5, 2, 6. Caland—"desired on earth", Śūn. Śrauta; 25.3. In these translations 'on earth' is altogether wrong.

(ग) गर्भो अस्पर्शीनार्गर्भो वनस्पतीनाम्।
 गर्भो विश्वस्य वृहस्वाने गर्भो यथास्थिति॥ सै० सं० २।५॥ ॥

i.e., Thou art the womb of annual plants, the womb of fruit trees [of the earth and of the mid-region], the womb of all the worlds, O ye Agnih [in all thy molecular arrangements] and ye are the womb of Ṛpah.

(च) तस्मादनन्मद्वधत श्रेयन्नः प्रविष्टः । कपिनः सं ॠ १७॥

i.e., Therefore, the Agnih molecules entered the annual plants from the midst.

Note—'From the midst' is not clear to me.

(छ) य [प्रसन्नयोः] ग्रा विवेचीयाः वस्तुपत्तीनः । प्रवर्षैः १२ १२॥

i.e., Agnis [of different molecular arrangements] that entered the annual plants, and the fruit bearing trees.

Seasonal holding by Annual Plants—Annual plants hold the Agnih molecules under a seasonal law. It is said —

(च) तमोशीद्विधिरे गर्गेवशिवम् । कतः १० १६ १६॥

i.e., That [Agnih,] the annual plants, held in the form of embryo, attained according to the season.

Note—This shows that the annual plants absorb the Agnih molecules, possibly in the form of some rays of the sun, and become ripe per season. Such is not the case with trees etc.

(छ) प्रान्तरेव शाप्पामत् । स कुश्मो भूल्या वस्तुपत्तीनान्तः ।

मै० सं ॠ १२ १२ ॥

i.e., The essence of Agnih went out. It became black and entered the trees.

Note—The nature of the essence of Agnih and the black form which it assumed, are both beyond me as yet.

(ज) श्रेय ध्य इति । शौ प्रां २१ २ १४॥

i.e., Hold the combustible molecules of Agnih.

Note—'Drink, while burning'. This clumsy translation of Eggeling has spoiled the very expression which is signified by the Sanskrit word Osadhih. This word shows that a special arrangement of Agnih molecules makes a substance combustible.

Plants with dense Agnih molecules

All plants do not absorb and store Agnih molecules of an equal density. This density differs with different plants. Some
of the plants which contain molecules of an extremely dense kind are given below:—

(1) Shami—Agniḥ is also called Śamī-garbha,¹ because it is found in a Śamī plant. The seers taught the mode of churning or kindling Agniḥ from a small piece of Śamī wood which is used as a lower arani, along with an Aśvattha piece used as the upper one. It will be further seen that aśvattha tree is also a repository of Agniḥ molecules. It is said:—

प्रजापति: श्रिनिमसुगं । सो विभेद । प्र या धक्ष्यतीति । त शम्भा अश्रम-यत् । तृ० ब्रा० ११०३१११।

i.e., Prajāpati created Agniḥ. He feared, Agniḥ will overburn me. He soothed [that Agniḥ] by means of the Śamī plant.

This was a common truth in our country. The classical poet Kālidāsa says:—

शमीनिम्बांमतरलीननाबकम् ।

i.e., Like a Śamī plant, in whose interior Agniḥ is merged.

(2) Aśvattha—This is the second tree of the plant world which is rich in the storage of Agniḥ molecules. It is said:—

(क) अपिनिक्षेप्यः निलायत । प्रश्वो रुपं कुलवा । सोऽदक्ष्येऽं संवत्सरकरिष्ठत् । तद्विज्ञानस्यवायवत्वम् । तृ० ब्रा० ११०३१११।

i.e., Agniḥ concealed himself from the gods. Its molecular arrangement adopted the form of a horse. He rested in the holy fig tree for a year. This is, why it is called aśvattha.

Concealment of Agniḥ—The idea of concealment is often expressed in the saṁhitās and Brāhmaṇas. This indicates some sort of temporary change in the physical conditions of that period.

(ख) प्रश्वे बृहत्ता-अपिनिक्षेप्योपकामनात् । स वाणिष्ठत्तु: तद्विज्ञानः । समभवत् । कपि० सं० ६१३।

i.e., Assuming [in his molecular arrangement] the shape of a horse, Agniḥ went away from the gods. Where he took rest, that became the holy fig tree.

Sage Aitareya clarifies it still further:—

(g) तेजसोऽवं एष बनस्पतिरजायत् यदद्वतयः

i.e., The fruit tree, which is called the holy fig tree is born of the paramāṇu of Agniḥ.

(च) महतां वा एतद्वृजो यदद्वत्यः

i.e., This is vigour of the Maruts, which is the holy fig tree.

Note—This shows that the Agniḥ molecules in this tree are partly derived from the Maruts of the mid-region.

(3) Venu=Bamboo—Bamboo is an Indonesian word, and is a corrupt form of the Sanskrit word venu. This is the third tree, which abounds in Agniḥ paramāṇu. It is said:

(क) प्रामेयं व वेश्यं

i.e., Bamboo, certainly, is rich in Agniḥ molecules.

(ख) प्रतिवेब्र्मे उद्वकामतः

i.e., Agniḥ went away from the gods. He entered into a bamboo-stem; therefore it is hollow or has fine veins....that, the bamboo, is the womb of Agniḥ.

(4) Munja=Sacharum Sara—This reed-grass is the fourth plant, which attracted a great amount of Agniḥ molecules. It is said:

श्रन्नर्वेब्र्मे उद्वकामतः

i.e., Agniḥ went away from the gods. He entered into a reed; therefore it is hollow, or has fine veins....that, the reed, is the womb of Agniḥ.²

So much will suffice in this connection for the present. I know that there are some difficult conceptions in the above pages, and especially, for those who are not well conversant with the Brāhmanika mode of expression; yet I could not avoid these statements. This much is certain that the plant

1. cf. कष्टमधु सं, २१०१०।।
2. cf. कष्टमधु सं, ३०१०।।
world denoted a step towards the preparation of the appearance of man on this earth.

Earth just like Lotus-stalk and Curd

I cannot close this account without quoting two most beautiful similies, which have been used by the seers to express the present inner state of the earth. These are :—

(1) यानि विसानि ताम्यस्य पूर्णिव्य रूपम्। श्रो ग्राहो ष्ठीत्राश्च।
(2) वधि त्रिविभयम् [ष्ठित्] तोकस्य रूपम्। श्रो ग्राहो ष्ठीत्राश्च।

i.e., (1) [In the sacrifice, where lotus flowers are placed] those that are the lotus-stalks, they are a form of this earth.

(2) Curd, doubtless, is a form of this earth.

A lotus-stalk has holes in it and is hollow, but its outer skin is hard. So also is curd, soft beneath, with a hard surface. No doubt, the similies are quite explanatory.

Appearance of Clefts in the Earth

The sun was pushed up. The earth had expanded, but it was yet level. Then occurred an incident, which gave rise to the appearance of clefts in the earth. It is said :—

ते हा०तिस्यानू भ्राजिज्रसो विमायजनं। तेष्यो वयानमस्य इमां पूर्णिवी पूर्णां विशिष्यानाम् प्रभू:। तानियं प्रतिदंशीततात्त्वत्। तां न्यायजनम्। सा सिही भूत्वा विश्रृण्णिति जनानाचरत। तत्त्वा: शोभिष्या हमे प्रवरा: प्रादीयंस्य। ये सया हमे प्रवरा:। समेव हृद तत: पुरा। ऐ० ग्राह २०६॥

i.e., The southern rays of the sun, performed the sacrifice for the northern rays. For the southern rays, who performed the sacrifice, those rays of the north gave the whole of the earth as a sacrificial fee. The earth, made those rays, who accepted the fee, hot. These rays atonce left the [earth.] The earth assuming the form of a tigress, while yawning (expanding) behaved towards the growth on it ? When it was shining, these clefts broke off. These are its clefts. Level, certainly, before that [the earth was.]

Note—This whole account is in a highly technical language. The expression is also quite mystical. But some thing can still be found out. It is that there was a period, when the whole earth received the rays of the southern part of the sun only. It will be seen that the Agniḥ-paramāṇus of the
earth unite with the rays of the sun, and create heat. Accordingly, in the present case it is to be presumed that the Agnirā rays feared being made very hot; so they left the earth. Another fact is also clear. The earth was at first level, and there were no clefts in it.

Earth appears shining at night

Another strange observation is met with in the Taitt. saṁhitā. It deserves careful verification. It is said:

सर्वा ह वा इय बयोम्यो नक्तं हशे दीप्यते।
तस्मादिविम वयांसि नक्तं
नाघ्यासते। पापा वा एष [भवित:] कुलायः।
तस्मादिनमारः प्रहांकः।
प्रणां ब्राह्म कुलायः।
१० ३० ५१६।११।

i.e., All this earth, certainly, appears shining to the look of birds at night. Hence birds do not sit on it at night.

The molecules of Agnih form a net in the Āpaḥ. Hence the Āpaḥ tear this Agnih. It is the net of Āpaḥ.

Note—Whether the earth emits the Agnih particles or the Agnih molecules present a brilliant panorama in the net work of Āpaḥ molecules are questions, which should be carefully answered. One thing, however, is noticed in another observation. It may help in the solution of this problem, and it is, therefore, given below.

Warm and Cold Water in wells—it is well known to all that during winter, the water of wells is warm, and during summer, this water is cold. This point is dealt with in the following way:

प्रजापतिः च जनु वा एष यस्सतत्तरः।
स हु यष्मासि स्थतरस्यस्ततः पावसू
उद्भागः तिष्ठति।
स यद्योऽधृय उद्धृत्तातिः,
श्रवं हृदम उपरि-उध्यो मंवति,
श्रवं हु तथा शीतो भवति।
तस्माद् श्रीवम उपरि-उध्यो सतः
शीलमधिनम्यते।
तस्माद् श्रीवमे शीताः;
कुप्या एष उवाहुनित।
श्रवं यदा शीतम उद्धृत्तातिः,
श्रवं हृदम उपरि शीतो भवति,
श्रवं हु तथा तद्दोषो भवति।
तस्माद् हृदम्य उपरि
शीतो एष उद्धृत्तातिः
श्रवं हृदम उवाहुनित।
एवं हु वा एष प्रजापतिः;
संवसरः प्रश्ना बिभाजि।
१० ३० ५१६।१।

i.e., Prajāpati [in this context] is, certainly, this Samvat-sara [=that fine layer of Āpaḥ and Agnih molecules, well knit together, which surrounds our solar system.] This, certainly,
PLACING OF AGNIH ON THE EARTH 247

rests for six months with one foot raised above, and for the other six months with the other foot in like manner. When he raises the warm foot, then, it becomes warm on the upper surface, and the lower area becomes cold. Hence, during the hot season upper surface is warm, and the lower area is, then, cool. Therefore, during the hot weather, they quote an example that the waters of the wells are cold. And, now, when the cold [foot] is raised up-wards, it then becomes cold on the upper surface, and the lower strata then becomes warm. Therefore during the winter, the upper surface is cold and warmth is felt in the lower strata. Therefore, during winter season they quote an example, that the waters of the wells are warm. Thus, certainly, this Prajāpati, who is the cause of the year, protects his subjects.

Note—What definite phenomenon underlies this statement is not quite clear to me. One thing, however, is evident. It is that the examples quoted about the nature of water in the wells are quite true.

Atmosphere of the Earth

Before closing this chapter, it will not be out of place to mention some observations about the nature of the atmosphere of the earth. It is said:

पृथिव्या मण्डलं कृत्स्नं चन्द्रोऽथं धार्यंते ।
वनोऽविधं: वर्षाणां धार्यंते चन्द्रे ज्ञानः ॥२५॥
वाहुतो चन्द्रमुः तिर्यङ्गुः तु मण्डलस्वः ।
सम्बलादु चन्द्रिकाणां धार्यामण्डलस्वं प्रतिनिधित्वः ॥२६॥
पन्नवातं तथाकाशं धार्यं छ महात्मनः ।
ब्रह्माण्डः पुराणः, पूर्वभागः, श्रो २१। बायु चु ४५११–५१॥

i.e., Complete sphere of the earth is held by condensed water particles. Beyond this sea of condensed water particles, it is held by condensed Agnih particles. Beyond this sphere of Agnih particles, the sphere towards the sides, as well as upwards is held by condensed Vāta (air ?). Beyond this is Akāśa, and beyond Akāśa, is Mahān.

Water particles, Ten Times—The oceans around the earth, and the water particles around the earth sphere are ten times the earth. A purāṇa says:

मूनेद्रशुभुङ्गाश्रामप: सम्बलातु भास्यितं गामु। मल्लस्थं चु १२३।४॥
i.e., The waters are ten times the earth. These protect the earth on all sides.

Note—This order is logical, and is to be studied according to the order of the creation of the Mahābhūtas.

Modern Conception—With an increasing number of experiments everyday, modern scientists have reached the following conclusion in this respect.

"The temperature apart from local fluctuations at first, falls steadily in going up from ground through the region known as the troposphere. This increase does not continue indefinitely, but comes to a halt at the tropopause, which is about 10 miles up. The subsequent variation at greater heights...is a first layer in which the temperature is increasing to a maximum of about 280° C absolute at a height of 30 miles,...30-47 miles 200° C absolute. 150 miles...high temperatures at the outer fringe of the atmosphere."¹¹

"The water-vapour is found only in the lowest layers of the atmosphere; there is very little above a height of five miles, because of the lower temperature at the higher levels."¹²

The above quotations show that at least two layers of quite different temperatures surround the earth. The one is of a lower temperature and the other of a higher temperature. The first layer mentioned in the purāṇas is of water particles, and this is of a lower temperature. The next one is of Agniḥ particles, and is, naturally, of a very high temperature.

The vision of the seers stands the test of scientific experiments even after a lapse of about five thousands of years.

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¹¹ The Upper Atmosphere, p. 36.
¹² Life on other Worlds, p. 57.
CHAPTER XXIV

ANTARIKSHA=BHUVAH=MADHYA STHANA

Mid-Region or The Ritadhama World

One Meaning—Antarikṣa denotes the mid-region in a technical or a limited sense. This sense is generally followed in mantras and Brāhmaṇas, and, consequently, I have used it throughout this work. Yāska, however, in his masterly exposition of Vedic knowledge, has used a more explicit term, madhyā sthāna, instead, to express the same idea. He has naturally warned the reader to avoid confusion.

Other Meaning—The second meaning of this word, is ākāśa, or the space-like unending vast region. This will be clear from the following quotation:—

मेस्वृष्टाद्वारसहायं प्रहलादस्य ताराविविष्कोन्तारिक्षलोकः। योगसूत्र, व्यासभाष्यः ११२६॥

i.e., Beginning from the back of Meru, [and going upwards] to Dhrūva, brilliant on account of planets, lunar mansions, and stars, is the antarikṣa.

Note—Meru does not belong to the earth proper. It is a layer of air and water vapours some miles above the earth. Dhrūva is one of a cluster of dolphin-like stars. The movements of our planetary system, the appearance of the seasons, and all the phenomena of the stars are bound with Dhrūva, by means of extremely fine air veins.

Vedic Support—According to the above view he heavenly region lies within the boundaries of antarikṣa. Possibly for this reason, it is said:—

P

1. निरक्त १११॥
2. मे १६ २० २६ ५॥ प्रहलादस्य च तारिक्षः। मै० ५० ११३॥
3. योगसूत जलविक्षा पृथ्वी शोभामारे व्यवस्थितः।
अतानाद्वारसह एसी मेही पृथ्वी ज्यो विना ॥ वायु पृथ्वी ५ ५॥
4. वातानीकिमयमेही द्रुवे बद्धानि सदा वायु ॥ वायु ५ ५॥
1. गौर्णतरिक्षे प्रतिपित्रता | ऐरो ब्रा १६६॥
i.e., The heavenly region rests in antarikṣa.
And another observation:—

2. वायुवर्तकालिसे बिहि: | विव: प्रतिपित्रा | ऐरो ब्रा १६१॥
i.e., Thou art Vāyu, resting in antarikṣa, and the supporter of heaven.

Another Brāhmaṇa work says:—

3. प्राणो वा गौर्णतरिक्ष | ऐरो ब्रा १३७॥
i.e., Prāṇa is, certainly, antarikṣa.

And as Prāṇa is all-pervading, the antarikṣa is all-pervading.

Another ancient view—The conception conveyed to us by the Vyāsa-commentary, and strengthened by the above authorities, has a support in another way also. The doctrine of many ancient teachers is:—

भष वतु परेण दिवम् प्राणतरिक्ष मन्नति | ऐरो ब्रा १२६॥
i.e., And there are [teachers] who believe that antarikṣa is beyond the heaven [also.]

Contents—With these preliminary remarks about the two shades of meanings of this word, the contents of the mid-region are now briefly described. The region is something space-like, but actually is not space or void, as was generally supposed by modern scientists till some time past. It is a field where many physical powers operate and it is the glory of Vedic knowledge to relate the intricacies of this working.

Physical powers—Present day scientists are trying to get a correct knowledge of the various phenomena of the “Upper Atmosphere”. They may succeed to some extent in their pursuit; but for a thorough knowledge of these all, they will have to study the nature and the working of the gods of this region. These gods, as already related in many previous chapters, have worked wonders in the story of creation, and are still carrying on this work in maintaining an order in the universe. The unending Deva cycle, always new, is going on.
Gods and god-groups—Conspicuous amongst the gods of this region are Vāyu, Varuṇa, Rudra, Indra, Viśvākarma Savitā and Āpaḥ; and amongst the groups of gods are Marutas, Rudras, Ribhus and Angirasas, as well as the streams of the mid-region.

God Vāyu, the superintendent—Vāyu controls the mid-region. All other actions of this region mainly depend on Vāyu. Therefore it is said:

वायु क्रो यस्तिरिक्ष्यमा: । मैः सं । १ ॥

Special Quality of gods—I have again and again written that gods are the various physical powers, which work in the universe. In order to understand this phase of their existence, the following two passages will be helpful:

1. प्रमुष्य प्रता: प्रज्ञातम: । कृः । १ ॥

2. न न हृ देवा प्रशस्तिः न पिबन्धित । एद्वेदांशति हस्तमा पुष्पिन्ति ।

विधेयुपारासं, श्रीघरीटका, उद्दूत, १

i.e., 1. Amrit=nectar is in the Āpaḥ.

2. The gods, certainly, do not eat anything, nor drink. Looking at this nectar, they are satisfied.

Note—The vicinity alone of this nectar, charges them with all power.

Vāyu shines—The mid-region appears shining even to an ordinary eye, during the night. It is mainly due to Vāyu. It is said:

1. ग्योद्यास्यांशयाय प्रमुष्य विष्णु महास्यांव्र लोकेश्व दीप्यते ।

गर्त: पुष्यक्षेऽवायुर्तरिशे । भारतियो दिवि । चन्द्रमा नक्षत्रमेतु । विसुद्ध मषपु ।

१० । दृष्ट । १ ॥

i.e., Now, certainly, these are his five lights; being blown they shine in these worlds. Agniḥ on the earth; Vāyu in the mid-region; the sun in the heaven; the moon in the stars, and electricity in the waters.

This fact is more clearly stated again:

2. ग्योद्यास्यांशयाय प्रमुष्य दीप्यते त । जैः दृष्ट । १ ॥

i.e., Vāyu shines in the mid-region.

1. श्रीवािल्व विचासा, संस्कारम्, पृ ४१ ।
Yajurveda has a pointed statement on this point:—

1. बायुर्वत लिखमतेजः । ११२४।।

i.e., Thou art Vāyu, of a sharp brilliancy.

All these three passages, show that Vāyu molecules possess the property of brilliancy. They must have the union of Agniḥ molecules. No doubt, Vāyu shines in antarikṣa.

4. बायोध्वय तेजस्व । तां ग्राण ११३३।।

i.e., With the brilliancy of Vāyu.

Reason behind it—On our planet, Vāyu=ordinary air, helps in the shining of Agniḥ=fire. It is an everyday experience, and, therefore it is said:—

तदहुः । यो व घनीतं उपहीप वालेनोपवाजयति मूयो वै तदृ दीप्यते ।

dīptināvibhāyati ।—। यदृ दीप्ये बायुरेत्व दीप्येऽ॥ जै । ग्राण । २१२५॥

i.e., That [the learned] say, whoever, after kindling the Agnis=fires, fans by wind, these shine more. This wind is brilliant,......what is for shining; air, certainly, is for shining.

Note—Vāta, here, is the ordinary air on the earth. Vāyu and Prāṇa are earlier and simpler forms of the same. It has already been said (p. 250) that Prāṇa is antarikṣa. Prāṇa pervades in the mid-region. All the three help in the act of brilliancy in the world.

Mid-region, brilliant—Some hints about it, and the causes thereof have been stated above. The same truth is expressed in other words also—

इदमेवातारिन्यत्वम् क्योः । जै । ग्राण । २१२६।, ४३६॥

i.e., This very mid-region is brilliancy.

The causes of the brilliancy of various objects are fairly hinted in the following passage:—

प्राणोन वा प्रायम्बिर्विपलेष । प्रायिता बायुः । बायुना प्राचर्दिवः ।

प्रायित्विन्य बायुः । जै । ग्राण । २१२६।, ४३६॥

i.e., Prāṇa helps in the shining of Agniḥ; Agniḥ helps in the shining of Vāyu; Vāyu helps in the shining of the sun; the sun helps in the shining of the moon.¹

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¹ In place of 'shining' as shown in my translation above, J. Eggeling uses 'kindled'. In the above context kindling of moon-will be ridiculous. So Eggeling's tr. requires improvement.
Indra—Space forbids me to write here about all the conspicuous gods. Something has been written about many of them, and Indra's acts have been fairly described. When we talk of Indra, the working of the Maruts comes straight forward to the mind. They play a wonderful part in this world and are, therefore, dealt with at some length.

Marutas—I was attracted to a serious study of the Marutas on account of a passage found in Bhagavad-gītā. It is as follows:—

Marīci: मरीचिः प्रसिद्धिः। १।१२।११।।
i.e., Of the Marutas I am Marīci.

In this context, lord Kṛṣṇa enumerates the best representatives of the different classes of objects and human beings. So Marīci is described as the best of the Marutas. Naturally an intimate knowledge of the Marutas was needed.

Birth—Marutas are closely related to Vāyu and Āpah. They are the sons of Rudra, who is one of the manifestations of Agniḥ molecules:

ख्रस्व सूनवः। ॐ ॐ ॐ।

पितामहात्मा। ॐ ॐ ॐ।

कृतिनमाता। ॐ ॐ ॐ।

बुधिनिर्वाचा जाता। ॐ ॐ ॐ।

हरस्वारुप विभूतिस्याता जाता। ॐ ॐ।

ते जीविरे विवाहः। ॐ ॐ।

Their mother is Priśni. The composition of this Priśni is not clear to me. They are born of electricity, giving out the h sound; may the Maruts protect us. They are born of heaven. They are nāraḥ—men of the mid-region.

Nature—Important adjectives which show their nature are given here:—

१. रिषास्वः। यजुः।

२. भाजलु—हस्तमः। यजुः।

३. विगुहः। यजुः।

४. भूमिष्यः। यजुः।

५. हिरायश्चिस्वः। यजुः।

६. प्रदृश्यो मर्त्यः। प्राप्तमुर्व, दत्त। मात्रवृक्षः। गृहयिष्याः।

आपो वै मर्त्यः। ऐ। ब्राह्मणः।

ब्रजस्वः वै मर्त्यः। भित्त। कौशलः। ब्राह्मणः।
i.e., 1. destroyers; 2. with shining spears; 3. with electric chariots; 4. having golden breasts; 5. with golden helmets; 6. with electric spears; 7. having electric hands; 8. with wondrous glow; 9. brilliant like the skin of the sun.

Nirukta—Yāska beautifully explains the meaning of the word Marut. He says:

मस्त: भितराविभ: वा। भितरोजिन: वा। महत्त्र द्रव्यति इति, वा।

भिक्त: ११५१३१।

i.e., The Maruts create a low sound. And they shine dimly. And also they are very speedy.

These three qualities are often met with in the mantras.

Strongest amongst the gods—As Indra is the strongest of all the gods, so his troops also are not inferior in strength to any god in any way. A Brāhmaṇa work says:

मस्तो वा प्रकामयत:। ब्रम्हमन्ड बलिष्ठ: भूविष्ठ: बीर्यवस्मा देवां
स्थाप: । जै० बा:२१२६७।।

Electricity and Lightning—Many physicists consider lightning and electricity as two altogether different things. Of course, there is a lot of difference between the two, but this difference is only due to their different molecules. Both are the offshoots of Agniḥ paramāṇus. It was an irony of fate that western scientists in their over-zeal and love for the theory of evolution, discarded the very basis of Agniḥ paramāṇus. They postulated an imaginary nomenclature of matter and energy. All this led to a view, which is now slowly and slowly loosing ground.

Electricity on our earth is often generated from water, and the atmospheric electricity is also generated from Āpāḥ. The difference between the two should be studied in future.

Marutas and Magnetism—Being associated with electricity the marutas are the generators of magnetic currents in all the three worlds. The vast magnetic fields in heaven, in the mid-region, and on and in the earth are due to them.

Mantras point out to their working:
\textbf{ANTARIKSHA, BHUVAH, MADHYA STHANA} 255

1. प्रैणामल्लेशु वियुरहेव रेषते भूमि: | शृऽ १४७३११।
2. भूमियखल्लेशु रेषते | शृऽ १२०१५।

\textit{i.e.}, During their extirpating march, the earth [in its
earliest condition] greatly trembles, like a woman deprived of

2. कोषयु गृहिष्टो पुक्तिमातरेऽ | शृऽ ५१५३११।
\textit{i.e.}, O ye, \textit{Maruts}, whose mother is \textit{Priśni}, make the earth
angry.

\textbf{Maruts and Indra—}In the figurative language of \textit{Veda}
\textit{Indra} is the king, and the \textit{Maruts} are his subjects\textsuperscript{1} and help
him in the form of his troops. Their troop-like action is
depicted in the following passage:

\begin{quote}
\textit{प्रण हेन्नो वर्तं नृत्तियम् महत ज्वाख्} || \textit{परंतुभर्तम् साम् अभिमितः}
\parविद्भीवतं || जै० ब्रा० २१४२२।
\end{quote}

\textit{i.e.}, And then, certainly, \textit{Indra}, when going to strike \textit{Vritra}
said to the \textit{Maruts}; "with axes in hands, you sport in circles
around me."

\textbf{Note—}\textit{Vāyu} pervades, but \textit{Indra} is confined, and \textit{Maruts}
play around him. \textit{Indra} is partly a manifestation of electricity
and \textit{Maruts} are also charged with electricity.\textsuperscript{2} How they both
work in the mid-region, is an interesting problem?

The very idea is found in another \textit{Brāhmaṇya}:

\begin{quote}
\textit{महतो हूँ बै कृिद्वो वर्तं नृत्तियम् इष्टगच्छतंमसितो: परि विन्दु:}
\parमहाकुष: || शृऽ ३५४१३२।
\end{quote}

\textit{i.e.}, When \textit{Indra} came ready to hit \textit{Vritra}, the sportive
\textit{Maruts} were sporting around him, singing his praises.

\textbf{Note—}As the \textit{Maruts} sport around \textit{Indra}, so it is certain,
that \textit{Indra} occupies a small space. The \textit{Maruts} issue low
sounds during their sport, and this is their ‘singing of prai{s}es’.

\textbf{Groups of Maruts—}There are seven groups of \textit{Maruts}. In
each group there are again seven \textit{Maruts}. They are often
remembered in this form in the \textit{mantras}:

\begin{quote}
1. विवरो महत्: | शृऽ ३५४१३६।
2. विवरो महत्: | दै० ३५३१३२।
3. गृहिष्ट: स्वरं: | गृऽ १४७१४।
\end{quote}
These quotations are clear, and support the above statement. Though their total is fortynine, yet sometime their number is given as forty and sixtythree also:

Note—The commentator Sāyana adds an important explanation to the number sixtythree. Further, to help future scholars, I sum up the different kinds of Maruts, mentioned in Vedic texts:

1. उष्णोत्पित्यः,
2. स्वाच्छिम्यः,
3. भ्रमिष्ठिम्यः: । जौ न ब्राह्म २।१६।६।
4. कौरिन: । शान ब्राह्म २।१५।३।२।
5. सान्तपना: । शान ब्राह्म २।१५।१।३।
6. स्वतवसः: । घोरा न महतः: स्वतवसः: । कौ ब्राह्म ५।१।२।
7. स्वाप्यः: । ऐं ब्राह्म ३।१।६।

Their properties and actions must differ, and require full elucidation.

Rays—Maruts exist in the form of rays, and hence they shed light:

1. ब्राह्म ये तत्वमिति रसिमिति: । भ्राह्म १।१६।४।
   i.e., Who pervade in the form of rays.
2. चूर्यस्यमयः: । भ्राह्म ५।१।४।१।
   i.e., Just like the rays of the sun.
3. वाताविभो महतः: । भ्राह्म ५।१५।६।४।
   i.e., These Maruts have the light or glow of Vāta.
4. विचुग्रहद्वसः: । भ्राह्म ५।१।४।१।
   i.e., Endowed with the force of electricity.
5. पावकास: सूर्य: सूर्याः इस्व । १५४२।।

i.e., The Maruts possess the properties of the Pāyaka Agniḥ molecules of the mid-region, as well as of the Śuci Agniḥ molecules of the sun, and are just like the rays of the sun.

Create New Rays—The rays of the sun came into existence from the juice which was adhering to the inner side of the shell from which the sun appeared. Their working and union with the sun will be explained in a subsequent chapter. Besides the sun, there are other gods who possess rays. The Maruts also possess rays, or more probably are in the form of rays themselves. It is, however, clear that some of them at least, create rays. It is said:—

6. सूर्यगति रक्षिमोजसा पथस्य सूर्याय यात्रेः । १५४३।।

i.e., The Maruts give birth to the ray, with their vigour and energy, which paves the way for the moving of the sun.

Geldner’s translation—German Professor Geldner translates the above half-mantra thus:—

"With might they drop the loosened rein so that the Sun may run his course."1

Its mistake—"Drop the loosened rein" is against the text.

Chatterji’s translation—While translating Rig. I. 19.8, Professor K.C. Chatterji supposes that the rays of the Maruts are, no doubt, the rays of the sun. He writes, "with the rays of the sun."

This is also an unfruitful burden on imagination.

Note—The electric and magnetic properties of the Maruts will not fail them during this cycle of creation. Like other gods they attained immortality after their birth. The energy or vigour of the Maruts is due to their properties. Along with this, it appears that they charge some other particles with their magnetism, or rather, they magnetize some particles. How these magnetized particles pave the way for the moving of the sun, is an intricate problem.

7. सूर्यमिलते वे रक्षिमभि: । १५४४।।

i.e., The Maruts well united on account of their rays.

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1. Quoted in, "Vedic Selections" by K.C. Chatterji, p. 77; 1944.
Self illuminated etc.—The Martus have some conspicuous properties, which are enumerated below:—

1. स्वभाव: | अऽ इऽ | ४।५१।३।३।१।१।
2. चिन्तनमावः | अऽ इऽ | ४।१५४।१६२।
3. स्वरोचिष्: | अऽ इऽ | ४।१५४।१४।१।१।
4. स्वशोचिच: | अऽ इऽ | े० ६।१६६।१६।१।१।
5. स्विकिष्ठः | अऽ इऽ | ४।१५४।१५।२।१।
6. स्वायत्तः | अऽ इऽ | ४।१५४।१६२।
7. स्वस्वास: | अऽ इऽ | ४।१५४।१५२।
8. स्वयुगः | अऽ इऽ | ४।१५४।१५२।
9. स्वप्वतः: | अऽ इऽ | ४।१५४।१५२।
10. स्वभूतः | अऽ इऽ | ४।१५४।१५२।


The first five qualities or properties are on account of their electric nature. These display the action of pure Agnih molecules. The sixth quality throws light on their birth from Rudra or Pritši; The seventh declares that their energy is inherent in them; eighth and ninth prove the magnetic nature, and the tenth shows that the group is automobile.

Union or grouping—I have already written on pp. 255-56 that the Maruts exist in groups. These groups are, at least, of three different formations. In all these three, the groups are self-joined or self-united. This is indicated by the compound sva-yujah. In other words, we should understand that it is the inherent property of the Maruts, or their rays, or their magnetized particles, to remain in groups.

Modern Experiments—The above truth, which was declared in a so-called ‘barbarous age’ by the divine seers, is formulated once again, though not in that graphic language, by the indefatigable efforts of centuries of modern
experiments. Professors Leigh Page and Norman Ilsley Adams of the Yale University, America write:—

"Modern experiments show that actually the elementary magnets under discussion are not individual molecules but rather groups of molecules which act in unison."

This 'action in unison of the groups of molecules of the elementary magnets' on this earth was witnessed by the seers in the action of the Maruts of the mid-region also. The slight difference between the two positions is that the terrestrial groups under our experiments are temporary, while the groups of the mid-region are immortal—amartyāḥ.²

Various glows—The Maruts exhibit various and wonderful glows. It is on account of the diversity of the density of the molecules of electricity of which they are formed. It is again said:—

1. चित्रा रूपांशि दश्यि। न्तं ॥
   i.e., Their wonderful forms are worthy to look at.

2. सहस्त्रायासः प्रपाणे न उभयः। न्तं ॥
   i.e., They are thousands, just like the waves of Āpah molecules.

Mid-region Electricity and Magnetism—Our antarikṣa or the mid-region, besides containing, Vāyu, Vāta, Āpah and Agniḥ, which all exist in different molecular arrangements, affords ample space to the above mentioned groups of Maruts, and many phenomena of electricity and magnetism are related to them. Their electric form has already been referred to in the previous paragraphs. In this connection, it is further stated that:—

प्रास्तापन्नल गुरुति युवान। चुष्ने निमित्तला विद्वेशु पव्वान।।

i.e., The Maruts established the well interwoven electric field, strong in united actions, in the network of the Āpah molecules of the mid-region, as a young wife is well established with a young husband.

2. Rig. I. 168.4.
All the compounds of *vidyut* in the Rigveda describe the electric nature of the *Maruts*. No doubt, lightning is nothing but a form of electricity.

**Birth of Asni—lightning**—The birth of lightning is one of the wonderous acts of the *Maruts*. Three passages related to this topic are already quoted on p. 71. These problematic passages will throw good light on the composition of the *Maruts*, and the mid-region *Pāvaka Agniḥ*.

The minute difference between *stanayitnu, vidyut* and *āsni* should be found out.

**Magnetism**—Now, as regards magnetism. The Veda says:—

एतं त्यं योजनमचलति सर्वाः यथमसं गोतमो व:।
पश्चाय निर्धारणजानां प्रयोदंश्त्रानि विघ्नावतो वराहृदु:॥

अः ११५्राविः

i.e., This, your union, the praise of which *Gotama* sang, while looking at your golden wheels and ferro [magnetic] tusks, when you were running after the extremely high clouds, O you Maruts! is indescribable.

**Note**—In the Vedic technique *Gotama* of the *mantra* is not a human seer, but a divine physical power, which produced the vibrations of lauds. The phenomenon of these wonderful vibrations or mantras requires lengthy exposition. *Ayo-daṃśtra* means, ‘with iron tusks’. The connection between electro-magnetic waves and iron is well known. How these iron atoms remain in the atmosphere and how they got attached to the *Marut* rays are problems to be solved in future.

**Field of the action of Maruts**—The field of the actions of these tiny particles is extremely vast. Practically it covers the whole solar system. Therefore it is said:—

१. चौमुख वाणुः कोपयति वृद्धिम् ॥ अः ११५्राविः

i.e., You make tremble the heavenly region; and make angry the earth.

२. भयंते विप्रा मूच्छता महद्युः ॥ अः १०२५

i.e., All the worlds fear from the *Maruts*.

३. वे रेतेतिन रोदसी विहुर्यः ॥ अः १०२५


i.e., Who cause, the far spread heaven and earth, to shake.

4. भ्रमादेवां भियसा भूमिरेजति | कृत्य ५१५६१२।।

i.e., From the fear of their force the earth (in its earliest condition even) trembles.

5, नीरं चक्रद्रु भिया | कृत्य ५१५६१२।।

i.e., [This earth] trembled like the heavenly region, from their fear.

6. हन्नां बिल्हिवर्मा भुवनानि पारिवा प्रच्यावनति वििवानि सक्नाना।।
   कृत्य ५१५६१३।।

i.e., Who thoroughly make tremble, all the strong worlds of the category of the earth, as well as of heaven, by their force.

7. तेस्रवभन्त स्वत्विसाग्न्य भिन्नवन भव्यां तपस्य: उसं ब्रह्मरे सद: ।
   कृत्य ५१५६१३।।

i.e., Self-powerful, they grew by their greatness, and they made their place in the Nāka world, and made wide their seat.

8. वे बालाभन्त पारिवा व जरावनतिरिख्य भवः
   ब्रजानं वा नदीनां सच्चनं वा महो दिष्टं: ।। कृत्य ५१५६१३।।

i.e., Those of the earth, those in the wide mid-region, and those in the fields of the streams, and those in the abode of the great heavenly region, increased.

Note—The *Maruts* prosper on the fields of streams, whether terrestrial or of the mid-region.

9. वे नाकस्याभि रोपने दिव्य देवास ग्रासते । कृत्य ५१५६१६।।

i.e., Who sit as gods [=immortals] in the bright heavenly world, above the Nāka.

10. श्रे वे निव्वा पारिवानि प्रवर्त रोपना दिष्टं । कृत्य ५१५६१६।।

i.e., Who spread wide all places of the earth, and the bright objects of the heaven.

Note—This relates to the phase, when the earth and heaven were expanding.
11. स्वरण्फ़, दियो नरः। क्रो ५०१६४०। स्वरांस्मृ। ।
क्रो ५००१६४०। ।
दियो मया। क्रो ५००१६४०। प्रत्यानु विवः। क्रो ५००१६४०। ।
i.e., *Naray* are nothing else than a special class of *Maruts*. Vedic scholars know it so well, that no explanation is required. They are the men of heaven. They go to the very boundaries of heaven.

All the above quotations though more or less similar, yet have different shades of meanings. The various states of the earth, the boundaries of heaven, the world of *Nāka*, the spreading wide of the regions, the shaking or quaking of the worlds, and the self-force of the *Maruts* require a penetrating insight for a full exposition of them. Mine is only a beginning of this study so far.

**Actions with Vāta**—The relations of the *Maruts* with *Vāta* molecules are worthy of note. A few glimpses of these are given below :

1. वातानु विरुद्धत्वाचियनिरक्त। क्रो ५० १६४०।
i.e., The *Maruts* acted on the *Vāta* particles with the force of their electricity.

2. वातानु ध्राश्वानु धुलूत्रिष्यृँ। क्रो ५० १६४०।
i.e. The *Maruts* yoke the rays of *Vātas* to their pole.

**Note**—The rays of the *Vātas* are the tiny shining particles of *Vāta*. This will be clear from the next quotation.

3. वातानु: मश्तः। क्रो ५० १६४०।
i.e., The *Maruts* having the brightness of *Vāta*.

**Note**—*Vāta* is different from *Vāyu*. Both are often expressed in a plural form. For example :

वातानु। क्रो ५० १६४०।
vwānu। क्रो ५० १६४०।

---

Along with Ludwig and Hopkins Macdonell and Keith opine :

"*Svar-nara* appears to be the proper name of a sacrificer in two verses of the Rigveda (VIII. 3,12; 12,2)," When compared with the words *divo-narah* and *divo naryah* the surmise of Macdonell and Keith appears to be baseless.

2. Creating ruddy hues. याति नास्तिनि क्रूङ्गन। क्रो ५०१६४०।
This shows that Vāta or Vāyu particles or molecules though closely united have their individual existence.

i.e., The well-united Maruts, and again with their place in Indra (the electric atoms enveloped by Vāyu molecules) create sounds, when revolving in a circle.

Magnetism and Raised Temperature—There are mantras in the Vedas, where Maruts are shown as working with Agniḥ molecules. This presents a problem. Do these Agniḥ molecules produce a temperature higher than the temperature of the Maruts? If so, the magnetism of the Maruts will be destroyed. It is a well known fact in modern physics that 'any magnetic bar loses its magnetism when its temperature is raised'.

Therefore, future Vedic scholars will have to look carefully into this matter. However, it should be remembered that Maruts are immortal. Their electric and magnetic properties would last till the end of this cycle.

Atmospheric Temperature—It is clear from the above statements that the mid-region, besides its Āpah molecules, is pervaded by Agniḥ molecules. Maruts were born from Agniḥ, Āpah and other Mahābhūtas or from their subsequent forms. The production of Ašni, and the brightness of Vāta molecules, are both due to some form of Agniḥ. This has been surmised to some extent by the present-day scientists.

Modern View—"Although the atmosphere extends at most, but a few hundred miles upwards, the magnetic field is appreciable up to a distance of 10,000 miles. At 400 miles, the magnetic field's intensity is about one eighth that at the surface."

Another scientist writes :

"There could no longer be any doubt that the upper atmosphere has an electrified region, or ionosphere ... ."

"The ionosphere is a thick mantle of ionized air, now known to consist of at least four different layers, which occupies the region of the atmosphere from 45 miles to about 200 miles above the ground. Its electrical properties are due to free electrons and ionized atoms and molecules.""
The above quotations show that the Vedic exposition of the contents of the mid-region deserves serious attention. According to Vedic statements, there is no question of two hundred, four hundred or ten thousands of miles of atmosphere above the surface of the earth, but up to the boundaries of heaven, the space is enjoyed by Indra, Vayu, the Maruts and many other gods. These all, more or less, have electric and often magnetized particles in them. Rigveda I. 88.5 calls the Maruts as ayodamśtra and hiranýacakra. Both the adjectives are important and ayodamśtra—Iron toothed—furnishes a clue to their magnetic nature. Iron particles, when specially effected with electricity, cause the formation of a magnet, and, therefore, naturally the Maruts control some magnetic power. The reader should turn back to pp. 192-194 also, for this topic.

Inherent Force—Wherefrom the Maruts derive their force? Veda declares that the force is inherent in them. It is their own force. The following portions of some Riks supply this information:

1. स्वतवंसे । कृत्रि ६१६१ही।
2. समिस्थला: । ब्रोजोभि: । कृत्रि ७१५६१ही।
3. भिया समिस्थला: । कृत्रि ७१५६१ही।
4. समिस्थलास: । तवियाभि: । अनन्तशुभ्रा……। कृत्रि ११५६१ही।

Meanings—1. The inherent force; 2. well united on account of their energy; 3. well united on account of their luster; 4. well united on account of their different mights.

Note—Ojobhiḥ and tavistibhiḥ, i.e., on account of their energies and mights, indicate the different degrees of their might, and therefore the use of the plural here.

Facing north-east—The Maruts carry on their cyclic movement while facing north-east. They were born in this posture:

ततो महतोश्य्तण्ड-ईश्वानमुखान् । जैं ब्राह १३६१ही।

i.e., Then [he or Puruṣa Prajāpati], created the Maruts, with their faces towards north-east.

1. cf. ब्रह्म: स्यूश्रमु । कृत्रि ५१६१ही, connected with Varuna.
The importance of the north-east intermediate direction, should be noted, after its comparison with an account of the north direction, given in articles 16 and 17 on pp. 120,121. While Rudra holds the north proper, his brother Isāna holds the inter-direction north-east; and Maruts are the creators of this north-east. Rigveda speaks of them as:

ईशानकुलः। कृ १६५१६॥

i.e., The makers of north-east.

They are themselves Isānah, according to Rig. I. 87, 4. It shows that though the sons of Rudra, they act as his younger brothers. And again:

ये प्रदूषितः ईशाना: मक्तः चरितः। घरव्र फऱ७५॥

i.e., The Maruts who are Isānah move in the waters of the mid-region.

Magnetic needle—Every student of physics, now knows, that when a bar magnet is suspended freely, it rests in a position which points to the direction of north and south. It is regarded as a property of a magnet. Now, it has been hinted at previously and will be described later on that magnetism in all the three worlds is due to the presence of Maruts in the mid-region. So, their working, which is explained in Vedic mantras, deserves a minute study.

Four Kinds of Magnets—Bhāratiya sages were fully aware of the existence of Natural Magnets. These were primarily of four kinds, and sometimes a fifth kind was also added to them. Some references about the mention of a magnet or magnets, found in old works, are given below. These are arranged in a chronological order:


2. Śānta Rakṣita in Tattva samgraha (circa the 8th cent.)—

ब्रह्मकारतप्रभा ग्राम्या। कारिका २५२०।

i.e., Magnetic radiance.

The author, further mentions the magnetic field, according to Śankara, an earlier author.

3. Varūha Mihira in Panca Siddhāntikā (5th cent. or earlier)—
i.e., The sphere of the earth, composed of the five Mahābhūtās, is set in motion, [like a wheel] surrounded in a cage of a group of stars in space or a hollow, just like a piece of iron, [placed] inside a magnetic field.

Note—The working of an electric fan is based on this principle.

4. Vāghbhaṭa in Rasaratna samuccaya (circa the 4th cent.):

Besides the well known four kinds, he mentions the fifth kind, rōmakānta¹, which attracts straws.

5. Vācaspati in Śabdārṇava (earlier than 1st cent.):

prasāvhaṃ lāohayyīṃ s vasyaḥ: kūr: kṣīṣi prastar etsa kānta:
prakṛtvak-drayak-chubhṛṣeṇa sākṣat prasūrya śāyasakta ityāṃhi ॥ ॥ ॥ ॥

Herein are enumerated the four classes:

(a) which simply attracts,
(b) which causes to run, liquify or melt,
(c) which kisses,
(d) which causes rotation.

6. Patanjali in Vyākaraṇa Mahābhaṣya (12th cent. B.V.)—

prayakṣaṇaṃ bhavyaḥ: sāṃkṣamit ॥ ॥ ॥

i.e., iron moves towards a magnet.

7. Viśnugupta in Arthaśāstra (14th cent. B.V.)—

prayakṣaṇaṃ pāṭhayaḥ ॥ ॥ ॥ ॥

i.e., Lodestone.

8. Vyāsabhāṣya on Yogasūtras :

sātmādānta-vyāsabhāṣya samśayataḥ ॥ ॥ ॥ ॥

¹. Trīnakānta, according to Śaṅkara Mīra, the Vaiśeṣika commen
tator, V. 1, 5.

². Quoted on p. 133 of Subhāsitaratnakosa; Kosambi ed.
i.e., Like a magnet, [which acts] from the mere fact of being near.


10. Vyāsa in Mahābhārata (3000 B.V.)—

i.e., As lifeless iron runs towards a magnet.

11. Agastya in Ratnasamhitā (5500 B.V.), mentions the lodestone.

This scanty list will suffice. The dates given here are not from a coined-history of Bhārata, but from its real history. I have, so far, not been able to trace the use of a magnetic needle, in ancient works.

Earth surrounded by a Magnetic Field—On p. 194, I have written that the sages regarded the quarters as "iron-needles". The Maruts and some other gods work to create these needles, which are certain rays, and thus produce a magnetic field.

Statues Tremble and Smile—It is mentioned in certain texts that at certain times the statues of gods tremble and smile. The students of sculpture should know that such statues are made of magnet-stones.

Prasastapāda—The famous Vaiśeṣika teacher observes a fact about the birth of the Maruts, which is unknown elsewhere. He writes:

तव-प्रयोगिन्नेव शरीरं महतं शोके | पदार्थविभागमेव, पू. २२५।

i.e., The body of the Maruts, in the world, is without a womb.

Paurāṇika account—The Maruts mentioned in Vaiyu Purāṇa are the sons of mother Aditi alone; but the Vedic gods, as already said, are born of heaven, Rudra, electricity and the mother Priśni. Therefore, their difference from the sons of Aditi should be noted. Their birth from heaven is already referred to on p. 253:

ले जजरे दिवं | मू. २१६४।

1. कमलते दैवतानि च ॥ ब्रह्मस्थितं संहृतं | वदमुतसाहे उद्वुता ॥

2. Ch. 67. 68.
i.e., They were born of heaven.¹

Colour and Form—The sky looks bright to an ordinary eye at night time. This is the colour of the mid-region, and also the colour of the Maruts:—

1. तमस्यास्मि वच्चिन्हां विष्णु मातोऽवैमभृत्तु ईशानमुखः:। ते ॐविरंदन्न
   वत् खेलन रूपं ततु। ॐ त्रा ॐ ॐ।

i.e., Him [to Prajāpati] the Maruts desired in this upper-direction, with their faces towards north-east. They attained that form, which is white.

The Cause of Colour—It has already been written in the chapter of 'Properties of matter', in articles 6-10 on pp. 41-52 that colour in general, and white colour in particular, is the result of Agniḥ molecules. The Maruts carry electriss molecules within them. It is this electricity which bestow c white colour.

2. ये शुक्काः चोरर्पर्वः। ॐ ॐ ॐ।

i.e., Who are bright and of ferocious form.

3. प्रसलेन वाजसा सुद्वन्द्रः ॐ वर्णः ॐ दिक्षे सुपेरसाम्।

i.e., On account of ceaseless motion or horse-like speed³ and self-force,³ the Maruts held the extremely moon-like [white] colour with a beautiful form.

Note—Speed bestows beautiful colour; and being connected with electricity, the bright colour of the Maruts is natural.⁴

Newton's coloured disc—Even a school student, reading in the ninth class, knows that a 'Newton's coloured disc,' when rotated at a great speed gives 'the impression of dull white colour.'⁵ This gives the idea that the Maruts, though possess-

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1. The commentator Skanda-svāmin adds a brief note on this birth.
2. Cf. महत: चन्द्रवर्णः। ॐ ॐ। ॐ।
3. सततवासिनः शीघ्रं व्याप्तयुक्ता, पाचसा-व्रातमीवेन वलेन; इति
   सावरणः।
4. cf. p. 41.
ing various colours, yet on account of their speed and the union of electricity, present the impression of white colour in the sky at night time. In the present context, ‘the ceaseless motion,’ whether circular or otherwise, should be discovered.

4. हिरण्यबर्मण्यः | अः || २१३४।११७ ||
i.e., The Maruts are of golden colour.

Streams of the mid-region—These streams afford a convenient passage or media for their motion to the Maruts. The mid-region, certainly, has many streams of Āpah molecules. These are Parusāy (R.V. V. 52, 9; X. 75, 5); Yamunā (R.V. V. 52, 17; X. 75, 5); Rasā, Anitabhā, Kūbhā, Krūru, Sīndhu, Saryu, (R. V. V. 53, 9); Asiknī (R.V. VIII. 20, 25) and Aṁśumati (R.V. VIII. 96, 14.)—There are many more streams also. These streams of Āpah atoms and molecules are a permanent source of the electricity of mid-region.

For Rasā, Vala and Paṇis, see Jai, Br. II. 440.

Course of these streams—The course of the streams of the mid-region can also be determined from the Veda-mantras. The following is an important reference in this connection:—

सुषोमा सिद्धः | वदेनामभिमािप्रसुसिद्धि नरः | निषेधस्त।६।२६।||
i.e., Su-somā, [a stream named in Rig. X. 75, 5]=having a good many Soma-molecules. It is Sīndhu; for towards it do flow the streams from all sides.

Modern students of Veda—Many so-called Vedic scholars, half educated and having no adequate knowledge of Vedic technique have tried in vain to trace human history and especially the early history of Bhārata in these sublime mantras. These poor scholars little know that the names of many terrestrial streams were given them by the sages, quite after the names of the streams of the mid-region, at a late period of human history. That the names were given at a late period, can be followed from the following:—

1. The secrets and the scientific principles of the origin of language are preserved only in the mantras. Western linguists admit their ignorance of this phase of human history. Based on this truth the great Manu declared that

1. Durga names them as: प्राकाशमिथ्योऽधिकारी: VIII. 2.
‘the names of terrestrial objects were given them after the Vedic words.’ Western students did not try to learn this science and yet began to translate Vedic works. They based their translations on a sophisticated ‘comparative philology’, which has not stood the test of criticism.

2. Yāska, the great exponent of the ‘science of meanings’ (arthanirvacana) while explaining Rig, X. 75.5 writes:

श्यार्कीयायं विपाहितवाहः। पूर्वमार्थीं उशिनिरुरा। निष्कन्त ५।२६॥

i.e., The stream Ārjikiyā, is regarded as Vipāṭ, when it is the name of the terrestrial river. This Vipāṭ was called by the name Urunjirā in former times.

Vipāṭ is a stream of the mid-region also. The terrestrial stream received its name after it. The Veda’s Vipāṭ is full of payah—divine milk (Rig. III. 33, 1.) Hence it can never be the stream of the earth.

Ārjikiyā was never the name of the terrestrial stream. But when the sages explained the Vedic mantra, they represented this stream as Vipāṭ, ‘to make the people understand in the light of some historical tinge given to it,’ in reality Veda contains eternal facts only.

3. Now another point. Varuṇa is a god of the mid-region. He is the main controller of the streams. The seven Sindhus are under his control. The streams are in the mid-region is clear from the Veda itself:

बुध्ये नन्दीमा रजःसु । च ० ७।१६॥

i.e., In the mid-region, in the [Apaḥ] particles of the rivers.

Sarasvatī is Pāvakā, i.e., rich in the Agniḥ molecules of the mid-region:

पावका नः सरस्वती । च ० १।२॥

The mid-region character of the streams of the mantras is quite clear.

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1. ब्रह्माण्ड पुरो, पूर्वभाग, १२।१७—१६॥
2. नभेंद्रभ्यं श्रीतिर्भवति-श्रीस्यानसंयुक्त । निष्कन्त १०।१०॥
3. पुंद्रवी प्रख्य वहण यहस्य ते सप्तसित्व: । च ० ५।६॥१२॥
4. There is the first part of a mantra:—

दत्रो प्रभांर्भर्ष्टद वर्षवाहूः-अपाह्नूः द्व्यं परिशिष्टि नदीनाम्।

ि० ३१३५।।

i.e., [The mid-region streams say:] "Indra, the wielder of the thunderbolt, scraped us and hit Vritra, who enveloped or surrounded the streams.

Period of the above incident—Vedic scholars definitely know that the hitting of Vritra took place at a time, when the earth was yet without its streams. Hence, the streams of the Veda, as erroneously supposed, are not terrestrial at all.

5. Marud vrıldhā—A special stream of this name, or streams in general, prosper on account of the Maruts. This is possible in the close vicinity of the Maruts, whose main place is in the mid-region. Therefore, Yāska, Samākṣa and others, the experts of Vedic knowledge, in times of old, unanimously proclaimed that the streams of the Vedas belong to the mid-region.

The Rāmāyaṇa of Vālmīki also mentions these streams. cf. Ayo. 91. 14. South. Rec.

The Battle of the ten Kings—The discovery of the ‘battle of ten kings’ in the Rigveda has been repeatedly trumpeted by western scholars. It is said to be connected with the terrestrial rivers Yamaṇā and Paruṣuṛ. Surmises, like it, degrade the level of scholarship of Christian and Jew Professors. I have explained at length the non-validity of the western view point about this discovery. The reader is requested to look into this matter in my Bhāratavarṣa Kā Brihad itihāṣa, Vol. II.² Space forbids me to dilate upon it here.

Earthquakes

Four main causes of earthquakes are mentioned in ancient texts. All require detailed exposition. "Striking of wind against wind"² is one of them. This is connected with the action of the Maruts. Its speed according to Bhrigu is the greatest:—

1. pp,123—126; Delhi, samvat 2017.

2. भ्रेणिलां भिन्नेष्ल निनिष्ठि:। बराहमहिरिष्टत्त्व बृह्सत्तहिता।
THE STORY OF CREATION

1. Quoted in Adbhutasagara, p. 408.
CHAPTER XXV

ANTARIKSA CONTINUED, MARUTS AND RAINS

Brief but scientific—Some ancient Bhārtiya works contain a passing reference to the phenomenon of rain. This reference though correct is, however, inadequate. For example Manu writes:

2. प्रमनी प्रासताहस्ति: सम्भव् भ्रातिलिङ्गलिंगते ।
   भ्रातिलिङ्ग जाभेते हुम्हि: ॥ मनु: ३१७॥

i.e., An oblation duly put into Agnih, reaches the sun; from the sun is born rain.

Again Yāska writes:

2. प्रां न व्योतवाच भिनीयङ्करमेहों वर्षृकर्म जायते । निष्टः ॥ १६॥

i.e., As the result of a combined action of waters and Agnih the phenomenon of rain takes place.

3. प्रमनेवं हुमो जाभेते ॥ हुमादः । प्राणादू हुम्हि: ॥
   शारो ग्राहो ॥ ११५॥ १७॥

i.e., From Agnih [of the earth] springs up the water-vapour, from water-vapour the abhra, from the abhra [falls] rain.

This is further explained in an elaborate way in the following verses of Vāyu purāṇa:

4. सर्वसूतसरीरेऽतु मापो व्युत्तादन्त या: ।
   तेषु संद्रहामवेषु ज्ञेमस्यावरेषु ।
   धृष्मूतास्तु ता मापो विन्द्यामन्तीह सर्वा: ॥ २२॥
   तेन चालारितु जाभेत स्थानमन्त्राम्भो स्थामूः ।
   यार्येऽर्यो हि सूतेम्यो भास्ते दिमिर्भिर्ज्जि ॥ २३॥
   समुद्राद वातुसंयोगाद वहुत्त्वलो गम्भस्यः ।
   तलत्तु-दहतुवादः काले परिवर्तों दिवाकरः ।
   वप्पत्त्त्वानो हि नेवेशय: । शुक्ल: शुक्लगत्स्ति । ॥ २४॥
i.e., Whatever waters are found in the bodies of all creatures, whether movable or immovable, these when scorched or heated, come forth entirely on this earth in the shape of water-vapours. These water-vapours give birth to *abhras* (condensed clouds); that is the place of *ambhasas*—waters.

The heat of the sun takes away the water from the creatures by means of the rays.

The rays of the sun, on account of their union with *Vāyu*, carry the waters from the ocean. From this, the revolving or turning back sun, at the proper time, under the law of seasons, gives these white waters to the *meghas* (clouds), by means of the white rays.

The waters resting in the *abhras* greatly stirred up by *Vāyu*, fall [on the earth.] For the welfare of all the creatures, by the *Vāyus* on all sides, it then rains during the six months for the growth of all creatures.

**Note**—The following important points arise out of this statement.

1. The formation of water vapours on account of heat.

2. These water vapous give birth to *abhras*. *Abhras* are not simple clouds, for, the word *megha*, which follows in verse 24, denotes a simple cloud. The trend of the statement forbids to confuse these two words.

3. The place of the *abhras*, is the place of the *ambhasas*.

The clusters of *abhras* are produced from water-vapours and heat. Śānti-parva, 336, 59.

Cf. *Vyomadhumā*=simple cloud. Śeṣa in A.C. p. 66.

4. *Ārka-teja*=The heat of the sun also works. The use of the word *teja* deserves careful attention. I have not yet

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1. cf. १. तदृष्ट्र व्याप्त वैभ्रमिक समक्ष्यति। शैवं श्राद्ध २१२६९०।।।

2. श्राद्ध वा श्रावं भ्रमः। शैवं श्राद्ध २१२६९०।।२।।

3. न श्राद्धः भयश्चयः जलाशयमः। शैवं श्राद्ध २१२६९०।।

प्रभवेनष्टितामानशिः २१२६९०।। उद्घूः।।
grasped the fine distinction of the technical words. The water is carried by the rays of the sun.

Water-vapours appear to be quite different from the waters carried by the rays of the sun. Water-vapours go up even during a night time, due to the heat produced on the earth. These go up to a definite distance, and occupy the abode of the abhuras. How far up these go, is not mentioned here?

5. Parivarta—Turning back of the sun. This phenomenon has been related in many works.

6. The white rays of the sun. The black and other rays will be described in one of the following chapters.

7. The white Āpah are given to the clouds.

8. Rainfall takes place, when the upper Vāyu strikes, the clouds.

9. The rainfall under this law takes place during the six months when the sun is in the southern hemisphere.

I have presented a faithful picture of the above statement, although many points are not yet clear to me.

Harīṣena Kālidāsa was well aware of the observation of the sages in this respect. His following remark sums up the ancient view:

§. भूसूक्ष्मयोऽति: सतिलस्यहोऽति: तत्स्वप्राप्त: कः नेप्ह: इ नेप्हृद्वृत् ॥ ॥

i.e., Where is that cloud, which is an aggregation of water-vapours, rays of the sun, water and the Maruts.

This pithy statement will be quite clear from the previous as well as the following quotations. These though almost similar are still necessary for our study, for even a slight difference, often throws further light on a long forgotten subject.

Source of the above—A mantra, addressed to the sun god, is reproduced below. This is the real source of all explanations on the subject of rain. Many subsequent teachers have pronounced their exposition on the subject of rain, which are based on this very mantra:—
i.e., During the dark time, when the sun is in the southern hemisphere special rays, which rob water [from the objects of the earth], and are well winged, wearing the clothes of Āpah particles rise up and fall towards (=on) the sun. When these rays return from the abode of rita [=the sun], after that [it rains], and by the waters containing oily particles[=ghrita], the earth becomes wet.

Note—The following important points come out of the above mantra:

(a) The harayah rays perform their action during six months only. How these remain during the remaining six months is not known?

(b) The adjective suparnāḥ shows that there may be other harayah rays, which are not winged.

(c) These rays after wearing the clothes of Āpah particles from this earth rise up and fall on the sun. The Āpah particles must be atom-like, for otherwise the rays would be heavier and unable to fly. I have noticed on p. 20 that ‘the rays of the sun are without weight.’ Veda has, therefore, given a special name to the rays which fly upwards.

(d) These very rays again, after throwing the water-particles on the surface of the sun, return back. Under what forces, these carry on this function, is yet to be discovered?

(e) The rays return from the abode of rita. Rita is that state of the Āpah molecules, in which these disintegrate into their atoms. Therefore, Yāska says, it is a special condition of Āpah molecules.

(f) The water of the rain-drops contains particles of oily matter in it. This water is termed ghrita in Vedic technique, This oil gathers in abhras. Sāntiparva, 336, 60.

1. cf. १. अनन्तमन्यदुर्दशनं पाव: कुष्यमन्यदु हृशित: सं भरति।

2. Cf. p. 25, 26 and 29 above.

Without keeping in view all the above points, a translation of this mantra will be altogether useless.

Kunhan Raja’s translation—My late lamented friend Dr. C.K. Raja, educated under the German Professor Geldner, translates:—

“The ruddy birds rise up to the heaven, to the dark path, robed in waters. They have come back hither from the abode of Rita. Immediately after that the earth is soaked with ghee.”

I have no comments to offer on this translation. Once you ignore the safe guiding eye of Yāśka, for an understanding of Vedic knowledge, pitfalls are, certainly, ready for you. True it is that without a special study of the various rays of the sun the truth behind the expression well-winged harayāḥ wrongly translated as “ruddy birds” will never be understood.

Sages explain the Mantra themself—The above quoted mantra pertaining to the sun-god is as if explained by a slightly different version in the teaching of Tittiri:—

५. प्रतिवर्षो दृष्य: शुष्करूपि मित्रो वसाना विभ्रमणते।
त भ्रावणउन्न स्वरूपी क्षत्रव आदित्य पृथ्वी पूर्वत्वृत्ते।
तैो स्तो जासित।

i.e., Dark coloured, [water-] robing rays, well-winged, wearing the clothes of Āpaḥ particles rise up and fall on the sun. These rays return having made abodes [for different Āpaḥ molecules in the sun]; after that [it rains] and by the waters containing oil particles [=ghrita] the earth becomes wet.

Note—“Dark coloured” in the above version requires further exposition.

Yāśka’s comment on the original mantra—Yāśka cites a Brāhmaṇa passage for the exposition of the Rik:—

५५. श्रवणिवृहद्ध स्रोती समीरयते। धामण्डः विचि [खलु वा] भूत्वा वर्षति।
भक्त: सुष्टं द्रुप्तं नयति। वद्य [खलु वा] भावाविविवो न्युभुरिदिः। पयिवेतते स्य वर्षति। इति। निष्कर्ष जासित।

1. Asya vāmasya Hymn, Madras, 1956
i.e., *Agniḥ*, certainly, sets in motion or drives away rain from this earth. Having become a coverer in the heaven, it rains. The *Maruts* carry the created rain. When that sun returns back along with downward rays, it rains.

Note—‘Coverer’; it appears to be that condition of water-vapours in which the molecules are extremely sparse, and thus cover all things. In this, as well as in the following passages of the ancient texts, it is *Agniḥ* or the *Agniḥ* particles of the earth which carry the water-vapours to the upper atmosphere. How the sun returns back and how the rays begin a downward course; these observations require further elucidation. In general some rays of the sun daily adopt a downward course.

Robing of water and the action of rays—This subject is treated in a very brief manner by *Śaunaka*. He says:

हृतं रक्षितस्चायः कर्मकुश च रक्षितमेऽः।
वेन मातिवि बाबोत्ताति सर्वभूतानि वक्ष्या || बृहद्वेवता २१६॥

i.e., The robing [of water particles here] and the further function by the rays in the yonder world is the [work of] this [sun.] On that account all beings do not know full well this phenomenon [merely] by the eye.

Note—We only see the rising of water-vapours from a vessel in which the water boils, or from the wet clothes which are spread in sunshine for drying. In the later case it is the rays of the sun which rob the wet clothes of water particles. In any case the water-vapours, when rising, are seen to a little distance only in the upward direction. Hence it is said that “all beings do not know full well” ? Beyond a certain distance the eye fails to distinguish them. Further, the function of the rays in the yonder world is not a subject of perception to a human eye. The seers saw these functions of the sun with the divine inner eye.

६. प्रविश्या इति द्रष्टिम् उदीर्घाति । धाममश्चविध्य भूत्या स्वर्गः । मश्तः
सृष्टं इति नयन्ति । वदासा भ्रात्रिस्यो स्वाधृतः रक्षितमेऽः
पर्यावरतं स्वयं स्वर्गः ।
काठक स० २२१॥

Note—This passage has two variant readings only as compared with no. 6. The meaning is not very different in any way.
10. श्रव्योरा वै मित्रायणां च। श्रव्ये त्रिवाह यात्राय वर्षति। द्रीवावह महो इति इत्त्रिम उदीर्यति। महतू न यथ: नयिति। यद्य खलु वा प्रसादाविद्यमय न्यायः

ििमिन्निः प्रयावर्तस्ते यथा वर्षति। धामच्छलिद्र खलु वै भूतवा वर्षति। तैः से

२१४२५।।।। तुलना तैः से २१४२५।।।।

i.e., Ahorātra, certainly, are Mitra and Varuṇa. By means of Ahorātra, verily, the Parjanya rains... verily becoming just like a coverer, it rains.

Note—The dots are in place of the matter which is almost identical with no. 8. Parjanya is in the mid-region and is a condition of water-vapours which is prior to the cloud state and subsequent to the state, when the water-molecules descend down from the sun. Ahorātra is not day and night, though it causes day and night. Parjanya is a separate object and its physical form is to be determined. Some clues for its determination are noted here:

(a) पर्जन्याय प्रतीत तिस्यंपुष्याय I।

i.e., Sing well for Parjanya, who is the son of heaven.

(b) १. वराहव्; २. स्वतपस; ३. विचुन्मह; ४. पूर्णय; ५. घरावय;

६. वृहोमश; ७. भानन्व भिदिष्य: I।

These are the seven names of the different kinds of Parjanya. Many names amongst these, are the names of the Maruts also. It appears that Parjanya and Maruts are closely related.

Exact location of Parjanya—The following passage will give a fair idea of the exact location of god Parjanya:

dिव रात्रियाल अन्तरिक्षात्। पृथिव्यास्ततो नो वस्त्रयावत्।

३.५ से २.१२९.

i.e., Rain descends from the sun, from the Parjanya, from the mid-region and from the atmosphere of the earth. From this atmosphere we get rain.

Four stages—The above-mentioned places are the four stages of the water particles, which descend from the sun to the earth. During their descent downward, these particles assume different forms.

(c) सूर्यश रश्यो चत्वारी ईयाते श्रव्य एव द्वेष्य। सूर्यश रशिलमिद्वि

इष्टं भावयति। तैः से ३.१२६।।
i.e., The rays of the sun, control the rain, in the form of Ahna. By means of the rays of the sun the rain is brought down.

Note—The Ahna of Ahorātra and Ahna signify the same physical object.

(d) हुबिरगो हूयते | सो शिक्षरास्त्रायुऽमपर्वति | तत्सूर्यां रक्षितायति । मनु १२।२, कुहलुकमहुऽवृह्द ाधारकपाठ ।

i.e., Agniḥ of the earth gets oblation [in different forms.] This Agniḥ creeps to the sun. The sun sends rain by means of the rays.

Note—This authority gives the idea that the Agniḥ particles and Apah particles both ascend to the sun in a creeping manner in many cases. The help of the rays is not mentioned here.

(e) अधिविरा हतो द्रविषीहै । महतो समुतत्त्वायवयति । एते मेस ब्रह्म: प्रदाता: । मै० स० २।१६॥

(f) अधिविरा हतो द्रविषीहै । महतो समुतत्त्वायवयति । तां सूर्यां रक्षितायति । मै० स० २।१६॥

i.e., Agniḥ sets in motion or drives away rain from the earth. Maruts make it fall from the yonder world. The rain is showered by the rays. These Maruts are the givers of rain.

(g) बापुरवा इतम समीखित । स ब्राह्मायवयति । ततो वर्षित ।

मै० स० ४।१६॥

i.e., Vāyu, certainly, sets these Apah particles in motion. Vāyu becomes full or swells. It then rains.

The Ocean of the Earth—Our ocean is a big source of water, for the rays of the sun. This has already been stated from a purāṇa in the beginning of this chapter. The relevant lines are reproduced here for the sake of convenience:

“The rays of the sun, on account of their union with Vāyu, carry the waters from the ocean.”

This truth was first seen by the seer, Mrigāra whose hymn is in the Atharva Veda:

1. ईव—प्रेरयेन चापि बलन्ते । महाभाष्य १।३।१॥
मरुत: समुद्राद्व उदू बहुति, दिव: पूर्विचीमः प्रभिवे मुहूर्ति।
प्रथम रूप हसि।

i.e., [The Maruts] that carry up waters to the sun from the ocean, and from the sun who gives them birth [again] on the earth.

The same truth is expressed in a slightly different manner:—

उदूरवल्ग मरुति समुद्राद्व वृष्टि वर्ष्यमणा पुरीविषा। तैः सः रूप हसि।

i.e., O ye Maruts! you drive up the rain from the ocean, and you, make the rain fall.

**Maruts make the clouds pour rain**—Maruts not only bring down rain drops from the upper region to the atmosphere of the earth, but they also make the clouds pour rain. Of course, Vāyu helps them in this action. It is said:—

मरुत: प्रभिवे मरुतः सं वन्तु पूर्विचिमुः। प्रथम रूप हसि।

i.e., Let the clouds, well falling [=pouring rain] on account of the Maruts, go to the earth in their right course.

Whitney’s translation does not clear the sense: “Let the clouds started forward by the Maruts, come together along the earth.”

**Summary**—A summary of the above observations will not be out of place here; so it is given below:—

1. **Agniḥ** particles carry the water-vapours to their place in the atmosphere of the earth. This place is only a few miles from the surface of the earth. There they form clouds, or more precisely, they get attached to some invisible clouds. Strong winds in that atmosphere shake the clouds and the rain falls.

2. The **hareyahaḥ** rays of the sun carry water particles from the surface of the oceans, as well as from the various objects of the earth. These rays are well-winged, and on account of the law of seasons, fly up to the sun. The water particles fall on the sun and are shattered there. The rays again bring these water particles back to the region of Parjanya. Thenceforth they descend by the actions of the Maruts and are deposited with the invisible clouds consequently by the slaps of the winds the drops fall on the earth,
Three Causes of Rainfall

Space forbids me to give in detail a further clarification of the phenomenon of rains. It is found in the purāṇas,¹ and I give a gist only of that exposition.

Condensed water-vapours [ghanāḥ] are of three kinds. They are:

1. Āgneyāḥ or Arṣajāḥ clouds—Rising on account of Agniḥ. These are born of water particles, are void of the property of electricity in the form of lighting, are dumb and have big bodies. They are under the control of the Āvaha region of Vāyu. They pour rain from a distance of 1½ miles to ¾ of a mile from above, and strike the summits of the mountains of the earth.

2. Brahmajāḥ Clouds—Born from the breath of Brahmā, a formation of Āpah, which works in the quarters. These clouds are endowed with the property of electricity,² produce thunder and love sound. It is the thunder of their sound, which bestows youth to the earth. They are controlled by the Pravaha region of Vāyu, and pour rain from a distance of about 5 miles or its half, from above.

3. The third kind is of those clouds, which work at the time of yuga dissolution.

THE PERVADING APAH

Meaning—The meaning of the word Āpah is given by a Brāhmaṇa work.

यदान्नीत तस्मादापः | यद्यक्षेतर तस्माद वा: | धौर्या । ॥२१ ॥

i.e., Because it pervaded, therefore it is [called] Āpah, and because it covered, therefore it is Vāh [or vār.]

Water—The English word “water” is only a transformation of the Vedic word “vār”. In the word water, the original sense is also changed. It should be remembered that the original word Āpah is always in the plural, and hence the first book of Moses, which is thousands of years later than the Veda, uses the word “waters” in the plural in Bible, Genesis 1. 2, 6.

Different entities pervade the Mid-region—I have already written in chapter III that ‘the paramāṇus of four kinds exist

¹ Vāyu purāṇa, 49, 28-41.
² Electricity is a property of the Āpah of mid-region. The quarters are also in the mid-region, Therefore these clouds produce thunder.
in a common space on account of the law of Mutual Entry\(^1\) of the Mahābhūtas.\(^1\) But without this special property of mutual entry, the very existence of the world would have been quite impossible.

Āpah pervade in various forms—The mid-region is a specific example of the working of this law. Along with Vāyu and Agniḥ it is pervaded by the Āpah molecules also. They assume various forms. It is said:—

> या हत्तिक्षे बहुधा भवति | मैः संत २१३१५१।।

i.e., [which Āpah assume various forms in the mid-region. Therefore the Brāhmaṇa work says:—

> बहुधो भाव: | खा ब्राह्म ३१२११५१।।

i.e., Many, certainly, are the Āpah.

All forms in incessant motion—The mid region presents an interesting field of deep study. All its Āpah molecules remain in a restless state. Just like the electrons, which revolve about the nucleus of an atom, they, always keep moving. It is said:—

1. नेम प्रापो भविष्यं बरती: | खा १२४४१५१।।

i.e., These Āpah particles, which keep moving incessantly, or with an unwinking eye, do not surpass [the glory of Varuṇa.]

2. पुनः: भविष्यं जरिविष्णु: | खा ३४६११।।

i.e., purifying, they move unresting.

Upper and Lower Waters—The Bible preserves an interesting account, which will remain unintelligible without a knowledge of its full context, which is found only in the works of the seers or their disciples. The Bible says:—

"6. And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters."

"7. And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so."

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1. pp. 65, 66.
“8. And God called the firmament Heaven.” Genesis, ch. 1.

Now, the original observation of the seers, preserved in the language of the sage Jaimini and others:—

1. भाषो वा इदम्यै महत्त सलिलमासित्। तद्यमेवश्चयमासित्। यदृ श्रायाम-श्चयमासित्। श्रायम्यु राज्मासु श्रायाम्याचाब्यात्। स एतामलिन्योसमम्यमाध्यात्। तद्यमेव हर्षः हर्षः अर्थवेच श्रायाम्यु। स एताय विनियो न्तोसं गायनः केवली-देशनाञ्जमकुस्त। स नवगिरिविखिरीमूर्त्व्वा उदस्तानात्। ता: परेण विव: पवौः हुत। ता एता: पवौः क्रतुः क्रवान्तीशीरसिध्दत। एककिसीया बिनिर्विन्द:—हस्मा श्रायाम-श्रायाम्याचाब्यात्। ता: परेण पृथिवी पवौः हुत। ता एता: पवौः प्रजः श्रायाम्याचाब्यात्।

तिथिनीरके तद्वन्दे। २३॥ जैऽ ब्रा: १॥

i.e., Āpah, certainly, was in the beginning, a great salila (in whose molecules every bhūta, was dissolved.) This was the sovereignty of the Āpah. Whatev over was the sovereignty of the Āpah the kingdom of the Āpah, the proper food of the Āpah, [all] that Āpah longed for. Let this be my sovereignty, my kingdom, my proper food.” He [Agniḥ] saw this glory of the Agni-stoma [sacrifice.] By it, [he] specially impelled these Āpah, the upper ones and the lower ones. He [Agniḥ], producing the vibrations of this very day to day laud, singly, made this [his] proper food. By means of the nine [and] twentyone [lauds] he made firm those upward Āpah. These Āpah were impelled beyond the heaven. Those very well impelled Āpah rain and stay according to the seasons. By means of this twentyone [laud] in the three-fold way, these lower Āpah were given seat. Those were impelled beyond the earth. These impelled Āpah; many people live by digging them. One kind is of the stationery [in the earth,] the other is the moving Āpah.

And this was adopted by Jaimini from Titēri, whose work preceeded his own :—

2. या परस्तातृ रोचने सूर्यस्य याशवार्वस्तादु उपतिष्ठत भ्राप:।

तैऽसो त्रि.२०॥१॥ (बृजः: २१४॥५॥)
i.e., The *Apaḥ* (waters) which are beyond, and in the brilliancy of the sun, and those which stay below.

*Apaḥ* Napat—This is the electric *Agniḥ* of the mid-region, which is the son of *Apaḥ*.

Charged with Atmospheric Electricity—The following *Rik* helps in the understanding of the above-mentioned nature of *Apaḥ* particles:

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समुद्रांशो या: चूजयः पावकाः तत्र भाषो देवी: । षो ७३०१४१२।
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i.e., For the purpose of the ocean of the mid-region, which [*Apaḥ* particles] are endowed with the power of *Suci Agniḥ* and *pāvaka Agniḥ,* and are goddesses.

Note—It is needless to say that *pāvaka and suci Agniḥ* definitely bestow the properties of atmospheric electricity to the *Apaḥ* particles. These *Apaḥ* have certainly become goddesses or immortal, for the present cycle. Their unresting condition is due to their being charged with electricity.

*Tanūnapāta,* is an other important word, which should be kept in mind while studying the *Apaḥ* of the mid-region. *Yāska* writes:

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तनुपात प्रतिरित शाकृपृष्ठः । प्रयोक्तः तथावतः उपवते । तता प्रतिरितः ।

निःसङ्ग यत्र।
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i.e., *Tanunapāta* is *Agniḥ* according to *Śakapūṣi.* The *Apaḥ* serve as bodies, for they pervade the mid-region.

This brief description of *Apaḥ* was necessary to grasp some basical truths about the atmosphere.

*Vayānsi*—The birds. These birds of the mid-region are no other than some special dust-like *Apaḥ* particles. These are explained as:

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वयांसि भाषः । प्रतिवेदवत्ता: । षो ११२५१६। स्कन्द भाष्य।
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i.e., These birds are *Apaḥ* particles, which are extremely swift. This fact has already been stated on p. 138, where the birth of *antarikṣa,* is described.

1. A. A. Macdonell’s translation:

“that clear and purifying have the ocean as their goal.”

*(Vedic Reader.)* The translator is sinfully ignorant of the real meanings of *suci* and *pāvaka* in the context of the physical interpretation.
Bible—The following passage of the Bible will not be clearly understood unless the Āpah nature of these birds is known. It is said in the chapter of GENESIS:

“And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven.” 1.20.

Note—The close relation of the word “waters” with Āpah has already been pointed out on p. 282. Waters are the mothers of all creation. The use of the word Āpah in Sanskrit language is always in the feminine gender. So life originated with them. The birds of the mid-region are Āpah particles. The “fowl that may fly...in the open firmament of heaven,” according to the above statement, had its birth in waters. Surely, the Bible has preserved the Vedic idea.

With Atmospheric Agnih—These Āpah particles enjoyed some union with Agnih atoms from their very birth, and received further help from the atmospheric Agnih. It is said:

1. गणे तव अवो वयो महिं स्रावं स्रावं वयाः विमाचारीति।
    तॊ तॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊतॊt
    i.e., O Agnih Vibhāvasu! your śrava and vayāḥ, they shine with brilliancy like the rays.

2. प्रभुः प्रश्नयति कस्मवद्व वाचब वाचब प्रभुः।
    तॊ तॊतॊt
    i.e., Agnih became immortal on account of these vayāḥ particles.

Roam about—These particles roam about hither and thither. It is said:

बय हब महत: केनचित्त पथा।
    तॊ तॊt
    i.e., O ye Maruts! just like these Āpah and Agnih particles, [coming] by any route.

It is, thus, clear that these particles (birds in the mystical language of the Veda) fly or roam about in the mid-region.

Loose, Mid-region—The mid-region is rather loose. It is said:

शिविलमिवात्तरिक्ष्यमः। कपिण्डल सं।
    तॊ तॊt
    i.e., The mid-region is as if loose.
Still Stable—In spite of its loose nature, it is still stable. These particles help in the stability, and remain stable in the mid-region. It is said:

हैःन्तरिक्षे वर्यांसि । तैः सः १२९१॥

i.e., Make stable in the mid-region these particles.

These particles do not go beyond the mid-region.

There are many other physical entities, which decorate the mid-region, but I close this chapter, here, for want of space.
CHAPTER XXVI

HEAVEN AND THE SUN
DYUH STHANA or THE APARAJITA WORLD\(^1\)

Two Names—Besides many other names, the sun is often called \(\text{Āditya}\) as well as \(\text{Sūrya}\). Of these two names the word \(\text{Āditya}\) sometimes denotes the earlier form while \(\text{Sūrya}\), the later one. It is just the same as is in the case of the two names \(\text{bhūmi}\) and \(\text{prithivī}\), used for the earth. In the case of the sun, although it is not a hard and fast rule, yet it often helps to explain some phases of the great god.

Stages of \(\text{Āditya}\)—The birth of the sun has been related on pp. 142-144. It should, further, be noted that the sun had to pass through many stages, before attaining its present position. It was at first in the vicinity of the earth. Slowly and slowly it was pushed up. The rays and the heaven (planets, stars etc.) were created along with the sun, but were not fully allied with it, as these are now. It appears that they adjusted themselves later on. And lastly the sun had a solar system of its own, and established its present position.

English words—The English words, earth, sun and heaven etc. are insufficient to give a clear idea of the different stages of these objects.

Word and the Three Worlds—I have again and again repeated this truth that the whole creation closely accompanies the Word. It is true in the case of the sun also. A \textit{mantra} in the Rigveda reads:

\begin{verbatim}
पवस्त्र वाचो प्रणवः सोमः ॥ श्र० १५४.२५॥
i.e., Blow or flow O Soma! as the foremost of speech.

This is explained in the \textit{Brāhmaṇa}—

वाम् वा रघु वितता यद्दौ लोकः ॥ तस्य यद्रो यद्रो यदर्थ तदशावान

\begin{verbatim}
धिः ॥ जै ्वा २.१३६.१॥
\end{verbatim}

1. \(\text{प्रण—प्रारंभितो [लोको] यत्रमल्ल यथिद्वैः ॥ जै ्वा २.१४७॥}
2. \(\text{प्रथे सिन्हुन् पञ्चमानो प्रयथि ॥ प्रथे वाचे प्रणवीयो गोष्टि गत्वान् ॥}

\begin{verbatim}
श्र० १५४.२५-२६॥
\end{verbatim}
i.e., It is The Word which pervades, [and which became] the three worlds. Of that speech that which burns foremost, is the yonder Sun.

Rays and the Sun—How The Word played its part in the case of the Sun? A passage of the Satapatha Br. is quoted on p. 142. Its translation is given below:—

“And that which was the juice adhered to the shell became the rays.”

These rays had to find their abode. The Word helped them:

रचिनः—द्याये-श्रादित्यम् प्रशृण्णति। इ० ए० र० १३१६।।

[He spoke] rasmih, with this word, he created the Sun.

So, it appears, that the rays immediately assembled and joined with the Sun. Under what other forces it happened, is a matter for the future?

The Sun is born of the rays, is said elsewhere also:—

एथ [सूर्यं] इ० गोरा:। ऐ० शा० ४२६।।

i.e., This Sun, verily, is born of the rays.

Sun attains the present position—The birth of the Sun has been described on pp. 142-144. More points have been explained above. It should be noted along with this, that the Sun had to pass through many stages before it attained its present position. It was born as Āditya. This name of the Sun is more used for the earlier stage. For its subsequent form the word Sūrya is generally used. This is not a hard and fast rule, but observing caution, it will help to understand the different phases with some certainty. Therefore it is said:—

एथ तै सूर्यो भूतवा अंगुलिकलोके स्वरति। गो० शा० प० ५१६।।

i.e., He, certainly, having become Sūrya, shines [or sends vibrations] in yonder world.

In the Āditya state it was in the vicinity of the earth. The rays, then, assembled in it. It was, then, slowly and slowly pushed up. It had at last a solar system of its own. A glimpse of its final state can be found in the following mantra pertaining to Indra:—
i.e., *Athravā Agnih*, the forerunner, spread wide the path [in the mid-region for Indra], then the bright Sun, the controller of laws, came into existence.

This *mantra* will be immediately quoted a second time. Here its second part is to be noted, where the word *Sūrya* is used for the present state of the Sun.

**Modern Verdict**—Modern physicists have rightly admitted the following drawback in the study of the Sun. They say:—

and the impossibility of stimulating solar conditions in the laboratory, the solar physicist has to rely on theoretical physics."

The story of creation as presented by me is based on the account which emanated from the direct vision of the seers. Therefore, I have been able to describe many conditions without hesitation. I hope that future experiments will bear their truth.

**Pushing up began**—A condition prior to the pushing up of the Sun is as given under:

समाने व योनावास्तं सूर्येवचानिनित्यः। ततः सूर्यं ऋवरं उद्विद्वतः।

काठक् सं ६१॥ कपिष्ठल सं ४१।॥

i.e., In one and the same womb were the two, the Sun, and *Agnih*. From that place the Sun ran upwards.

**Preparation for the path of flight**—*Athravā Agnih* was the first to pave the way for this wonderful upward flight. It is said:

यज्ञरथवं प्रथम: पयस्तले तत: सूर्यं ऋत्वा बैन ग्राजन।

क्० १।५।१।५॥

i.e., *Athravā Agnih*, the forerunner, spread wide the path [for Indra in the mid-region], then the present form of the Sun, the bright one, came into existence.

**Not Bright at first**—Brightness is a late feature of the Sun. The *Brāhmaṇa* says:

Ⅰ. नी हा बा इदमः च सूर्यं भ्राज प्रास। सु ्ञः ब्रा ६।१।५।१।५॥

i.e., In the beginning, brightness, certainly, was not in the Sun.

II—V. Sage Tittiri counts as many as four causes which bestowed brightness to the Sun. The first was the ten Rīṣabhās (II. 1, 4.), the second was the white Vaśā born of the Sun (II. 1, 8), the third was the Somāraudra caru (II. 2, 10), and the fourth was the ekavinśarātra (VII. 3, 10). I have not yet any clear conception of these processes.

VI. In Maitrāyaṇi saṁhitā, a long passage II. 5, 10 is devoted to explain the whole phenomenon. That also till now is beyond my reach.

VII, VIII. Yajurveda XIII. 22, 23 say that the rays cause the lustures or the lights. The plural in ‘lustures’ is noteworthy.

Source of Rik-Vibrations—And now I relate a startling observation. The Sun in its present state, is regarded as a source of many sound-waves, and especially of Rik-Vibrations. It is said:

1. एष हि वेसूयो चूर्तश्च श्रोतिमृंगलकेः स्वरांति।
   गो । ब्राह्मणः पूर्वः ॥ १ ॥
   i.e., This, certainly, after becoming Sūrya creates sound-waves.

2. यदेतत्वग्रधलं (सूर्यः) तपति।...
   स ऋषिज्ञो लोकः।
   शो । ब्राह्मणः ॥ १ ॥
   i.e., That which is the sphere of the Sun, and generates heat that is the world of Riks.

Abode of All the Gods and Seers—When the Sun is an abode of the Riks, it must also be an abode of the Seers and the Gods. The Riks, the Seers and the Gods of the Riks are inseparable. So Pūlasiṣṭha, Pulha, Atri, Vaśiṣṭha, Angira, Bhrigu, Gautama, Bharadvāja, Kaśyapa, Jamadagni and Viśvāmitra are all in the Sun.

1. Consult my Veda Vidya Nidarshana, pp. 248-249
2. प्रार्थणा ऋषिज्ञः। शो । ब्राह्मणः ॥ १ ॥
292.

THE STORY OF CREATION

सहस्राश्रीया: कवयो वे गोपायति सूरयम्।
क्रियो तपस्वतो यम तपोर्जनः—अपि गण्यतात्।।

i.e., Thousand-eyed Seers, who protect the Sun, O Yama! the Seers, who were born on account of penance of the physical powers, and underwent penance, to them you also go.

Vyāsa Explains—The great sage Kṛṣṇa Dvaipāyana Veda Vyāsa says:

वर्ज्यं रशिमसहस्रं द्वारास्विन्विव बहुज्ञमः।
वसन्याबिश्वं मन्यं सन्तितः दैवतः सहु।।वादित्ति १७२१॥॥

i.e., In whose thousand rays, after having resorted to them, live the [physical divine] sages, and also the perfected ones along with the gods, just like birds, who live on the branches of a tree.

Veda Mantras—Such were the original, old and new divine Seers¹, who under eternal physical laws, set vibrations or sound-waves, which were later on heard by the human Seers on this earth. Many such vibrations are still going on and can be heard by any pious soul, who receives the blessings of the only Source of Bliss. The Vedic mantras are nothing short of these eternal waves. These mantras came out of the innermost recesses of the hearts of human sages, on account of their extreme love for the Almighty², which was a result of their penance, done during the previous cycle of creation. This divine speech entered into the minds of the Seers by the grace of God, and from thence it came out.³

Krishna, the Son of Devaki Eulogizes—Lord Kṛṣṇa, who sang the immortal song of Gitā, simultaneously salutes the Almighty and the Sun, in the introductory verse of the eulogy of the Sun, which was subsequently composed by his son, Sāmba. I attach the translation:

"Obeisance to the great Almighty and his creation, the Sun, the lord of rays, whose extremely brilliant lusture is a transformation of the Word and its meaning, and in whose disk the abode of the three Vedas, arose in front the sacred Om, on account of the ruddiness, and who dispels darkness of the

1. क्रिय: सहव देव:। क्रो १०१७३१॥
2. प्रेषया तदेव निहितं मुहारि:। क्रो १०१७३१॥
3. तामू गृहित्वादनु कृपित्वू प्रविधादम्। क्रो १०१७३१॥॥
sky by means of his seven musical notes coming out in the shape of horses [formed by the rays] and by the shining letters, words and their arrangements [produced by the vibrations of the rays],” carrying as if the chariot of knowledge.

Veda proclaims in unequivocal terms — And Veda itself proclaims the sublime truth :—

1. निवसर्वतः सदने प्रश्न तानि विप्रा: उक्तंभिः कवयो गृहुनिति।

i.e., In the house of the Sun, the learned Seers praise his (Indras) deeds by their mantras.

2. इदं कवेराचित्वत्रय स्वराजः। नः २।२५।१।

i.e., This kingdom of the Sun, the poet [=composer of the mantras].

3. पतंज्लो वाचं मनसा बिभित। नः १८।२।७।२।

i.e., The Sun holds the sacred word by means of the divine mind.

4. त्रितिष्ठ जूमालः, दिविवेज ईमते, वपूर्यं तिष्ठति मध्ये प्रहुः।

i.e., During forenoon, with the Riks, the god in the heaven; during noon he is with Yajurveda, during sun-set he is glorious with the Samaveda, the Sun goes on, never void of the triple science of Veda.

Sun, an embodiment—According to the Jain lexicographer Hemacandra, a name of the Sun is trayltamuh, i.e., with a body of the triple science, and the ancient Śeṣa quoted by him, reads another name vedodayah, i.e., the coming forth of the Veda, for the same purpose.

Cosmos and its knowledge—It is a miracle of miracles, and a fact of facts, that the Almighty God, under whose law the universe undergoes creation and dissolution, has preserved for mankind, a complete knowledge of the physical powers, working in the universe, in the form of these vibrations coming out of the great Sun. These vibrations or mantras work under eternal physical laws, and hence are the same during every cycle of creation. Human Seers received this holy knowledge. Their penance opened their eye and their ear.
The Sun, no doubt, is the source wherefrom the mantras emanate even now. The deep secrets of this science were fully known to the Seers. Modern science requires an open mind and sufficient time to realize this subtle truth. In this connection verse fifth of the above quoted work of Sāmba, and composed by Śrī Kṛṣṇa himself, is again very important. It should be studied carefully. Any ardent student of the science of language will be amply repaid by a study of this subject.

Brihaspati—Jupiter—The planet Brihaspati is another source of the sacred lore: Rigveda X. 71 hymn is in praise of this god, the teacher of gods in general. Its first mantra declares this truth. The hymn is replete with many hints about the origin of language and showers snow on the so-called scientific theories about it.

Noise in Jupiter—The noise created by the planet Jupiter is well known in the Veda. For example:—

1. ब्रह्मानुपलिताशस्त्रस्वस्त्रेषु रघु । हु | हु (ाँ ते)॥
   i.e., Brihaspati, while sitting on the three seats, with his noise.

2. गृहन बलं हरोज फलियं रघु । हु | हु (ाँ ते)॥
   i.e., [Brihaspati] with the help of the group of Angirā rays and with his noise, cut Vāla into pieces, whose parts also moved.

3. ब्रह्मानुपलिताशस्त्रवेगा विकृती । हु | हु (ाँ ते)॥
   i.e., Brihaspati, with the variety of noise, cut into pieces Vāla.

Latest Report about Jupiter—If the following report and its interpretation may prove correct, it will help to some extent in interpreting the above noted Vedic statements:—

“New Radio Waves in Space”

“Moscow, Oct. 28 (AP)—The Soviet Zond 2 space probe has discovered powerful radio waves of unknown origin in inter-planetary space, Tass reported today.”

“The emissions, possibly from the planet Jupiter, were about 100 times stronger than what would have been expected from previously available data, the report said.”
"They were discovered when Zond—2 was tuned in on a 1,500 metre wave length for the first time during the space probe which was launched on Nov. 30, 1964, toward Mars."

"So far, it has not been possible to establish the area from which coming." (Hindustan Times, New Delhi; dated 29-10-65.)

I am, however, not yet certain about the above interpretation of the report. Therefore I resume the subject proper of the nature of horses—chandas=vibrations emanating from the Sun.

Divine Horses—These horses born of the Sun, have arranged themselves in seven lines. The richness of material about them and a lucid description are a source of joy for the reader who understands the subject. It is like this:

1. हृष्याश्र सप्त चन्द्रासिद्ध तेषा नामांक ये सूर्यः।
   गायत्री च सूर्यसुर्ध्वायाः छक्ती त्रिध्रुवेव च।
   अनुष्टुप पांडुराज्ञकाश्चतन्मयो र्ये।।विभासु पुरावः ॥ २१६५॥
   i.e., The horses are the seven metres, "Listen to their names, which I say."
   These are Gayatri, Brihati, Usnaka, Jagati, Triṣṭup, Anuṣṭupa and Pankti; these metres are called the horses of the Sun.

2. (a) छन्दोदैवितीयसिद्धसृष्टिः यस्तः श्रवणः वाकः। स्पष्टः । २१६५॥
   (b) सत्ताश्रवस्थाचं चतन्मूर्ति वहन्ते वामतो भूवम्। २१६५॥
   (c) भूताद्वारनामवचः स्थवर्त्ते वैविन्द्यः। २१६५॥
   (d) हेरीतान्तः विनेतावर्तः हुमावदिभः। २१६५॥
   ब्रह्माण्ड पुरावः, पूर्वविभोगः।
   i.e., (a) By means of the metres, which are in the form of horses.
   (b) The metres in the form of seven horses, carry the Sun by a left-hand path in relation to the dolphin.

1. विध्यालो भ्रमणः। ॥ २१६५॥
   श्रवणः ॥ २१६५॥
   i.e., these horses are born of the Āpah molecules of the Sun

2. छन्दोसिद्धसृष्टिः। नामाः ॥ २१६५॥
(c) By means of the Bhadra horses, whose motion is without feet, moves the abode of Vedic mantras, (=the Sun) with quivering waves.

(d) By means of the immortal harita and pinga horses (=harita and pinga rays), who are masters and defenders of the sacred knowledge (=mantras.)

These verses clearly state that:

1. The rays of the Sun, start in seven different metres, and are called the seven Divine horses.
2. Their names are Bhadra, Harita, Pinga and Īśvara.
3. These metres move with quivering waves.
4. The vibrations produced by the metres are not like the foot-pace of a horse.
5. The Sun serves as the abode of Vedic mantras.

Veda supports the above Exposition—The statements in the purāṇas are the exposition of the Veda mantras. It is not their imaginary utterance:

1. सन्ध ल्या हरितो रचे वहृति वेय खूर्ष्य।
   नोकिन्केश्व विद्वछस। II कृि ०७०१३०५३।

   i.e., O god Sun! the seven Harit horses carry you in your chariot, O you learned! with your brilliant rays.

Note—The language is highly mystic, and should be interpreted according to the context. The Sun is learned, because it is the abode of Veda mantras.¹

2. मन्द्रा लच्य हरितं सूर्यस्य चिन्ता एतमा अनुमानाभ:।
   नरस्वतो दिवं श्रा पुष्तमस्यु: परर यावाग्यविय यन्ति सच्।।

   कृि ०११८५४३१।

   i.e., Bhadra and Harit horses [moving in the form of waves] of the Sun, of wonderful colours, the Etyagvās, well intoxicated, have ascended the back of heaven, bowing [=adopting a bending course], they traverse round Heaven and Earth in no time.

1. प्र ब्रह्मेतु सदाहतस्य। कृि ०७०६६१०।।
   i.e., Let the Veda reach us from the house of Rita (=the Sun.)
Note—The rays adopt a bending course, and are of wonderful colours. They are composed of the *Mahābhūtas*. It is said:—

निधातवः परम ब्रह्म गाधो दिवसचरित परि सचो भ्रमन्।

And, Of three *dhūtus* (=Mahābhūtas) are his (=Sun’s) best rays; they traverse round the shores of Heaven in no time.

3. This, “in no time” (=sadyah) is a very short period of time. It it like *kṣipra, etarhi* and *idānām*, which are minutely described in *Śat. Br. XII*. 3, 2, 8. It is in no case, “in one day” as translated by A.A. Macdonell (*Vedic Reader*, p. 96)\(^1\) and also by K.C. Chatterji (*Vedic Selections*, p. 95.) Such translations are the result of ignorance of *Vedic* technique. The right translation gives an approximate idea of the time, taken by the rays to travel. In modern science the conception of the travelling speed of light approaches this truth.

4. The horses are *Bhadars, Harits, Citras* and *Etagvās*.

5. The rays which assume a horse like form, follow a bending course (=namasyantah). They do not travel in straight lines.

6. The rays or horses run quivering or intoxicated.\(^2\) The simile is a masterpiece of the *Vedic* language. An intoxicated man quivers, so the rays when travelling quiver.

7. Light does not travel, as is wrongly supposed in modern physics, but rays travel and become the cause of light.

Vibrations are Metres—An immature student of *Veda* mantras may question about the validity of the proposition, as to how the *chandās* or vibrations and the metres of the mantras are the same? I quote, here, only one proof for this interpretation. It is:—

\[1\] Macdonell’s translation (Rig. IV, 51, 5) pertains to *Uras* or the Dawn. The phenomenon of Dawn takes place for a short time only, before sun-rise. How can, then, the rays of Dawn “proceed around the worlds in one day”? They certainly travel in a few seconds only.

\[2\] *रेषःदेवयुम्बस्मान्: | न्व० ३६।१९॥

i.e., He rises intoxicated by the songs of the signers.
i.e., The *Maruts* [who travel in vibrations] at great speed praise *Indra* in his seat of the mid-region, by means of the Sacred Word in the form of the *Trishtubha* metre, which presses the heavenly world.

The metres also move with quivering waves is already noticed.

**Gist—**This in brief, is the supreme Vedic truth, which unravels the hidden secret of the divine nature of Ved- *montras.* Teachers well-versed in the science of the Sacred Word can throw further light on the subject. Students of Vedic lore know well that the great *Yajnavalkya* received the white *Yajus* from the Sun. (*Brihad. up. VI 5,3.*)

**FUEL OF THE SUN**

**Water-Apah-Hydrogen-Helium**—This is a burning problem with the scientists of today. Various surmises have been proposed. The *Seers* have their own story to tell about it. Their vision discloses a clear picture of the whole phenomenon. Eleven authorities, indicating that the Sun is a place of *Apah*, have already been quoted on pp. 24-27. More are reproduced below to throw further light on the subject. The *Vayu purāṇa* says:—

सप्तरिश्मिणेऽवृक्षम् वृक्षितिक्षुः विभासुः ||१३६||

यशस्वरिष्णिक्षम्यावक्षितः विवनमयो गमनितश्च ||

हरिवर्ती रसमयस्तम्य दीप्यमणास्तस स्ततिभिः ||१३६||

भूय एव विवर्त्ते व्याप्तिनः वनं श्रद्धते ||

भौम काण्तेन्त्वः तेजो मूषम्य प्रदेयस्तु दीप्यते ||१४०||

तस्माद्वस्तः सूर्यस्य तपतः सति स्वस्तिः कथ्यते ||

नाष्ठक्ष्णाः तपते सूर्याः नाष्ठक्ष्णाः परिविवप्यते ||१४१||

नाष्ठक्ष्णाः परिविवप्ति वारिष्ठा दीप्यते रथः ||

तस्माद्यो वदे दीप्यते रविरमये ||१४२|| पूर्व ३०१||

i.e., [At the time of dissolution] the Sun (or one, whose very wealth is his multiplicity of brilliancy), after having become only seven rayed, rose up, 138.

---

The lord of unbearable rays, drinking waters by his Harit rays, shining on account of the seven [rays.] 139.

Once again, these return, or are transformed, pervading the mid-region slowly and slowly. The heat particles of earth, whose fuel is wood, shine more on account of the waters. 140.

Hence, water is said to be the greatest cause of the heat of the Sun. The Sun does not produce heat without rain, (=wrisiti=water molecules), nor without rain drops it is encircled by a white halo (or ring.) 141.

Nor without rain, accumulate the [rays ;] the Sun [the abode of sounds=rava] looks bright on account of water. Therefore drinking the waters, the Sun shines in the atmosphere. 142.

Note—The construction of the above verses is rather difficult; still I have tried to give a faithful translation.

Apah and the Sun—I will, here, request my readers to turn back to pp. 24-29, for a fresh study of the working of Apah in and around the Sun. Along with those passages the following also will prove useful:

1. In a hymn addressed to the Sun, it is said:—

दिव्य गुणोऽश्यं कायसं यूर्मक्यं प्रणों गर्भेण् ।

i.e., The divine well-winged (=Sun), the great crow, having in its midst the Apah molecules.

Note—The mystic words "great crow" require explanation.

2. Of the seventeen varieties of Apah, which find their place in the Râjasûya sacrifice, one is:—

सूर्येत्ववस्तु रूप राशिवादः। यजुर्वेदः १०।४।।

i.e., [The Apah] which take their place in the skin of the Sun.

Note—The Apah particles are on the surface of the Sun. What is in the innermost parts of the Sun is not yet known to me?

1. (a) अविभवयम् । p. 26 (j). उद्वेषयम्:। निक्षत्र ७१२३।।
   (b) हृषिष्य जारोि प्रणयम् । कृष्ण १२१४।।

i.e., The Sun is the cause of the decay of Apah molecules by its oblation.
After disintegration—Āpah molecules, after disintegration on the surface of the Sun, assume the following forms:—

1. Amritā—immortal nectar.

(a) In a mantra pertaining to god Savitā, a state of the Sun, it is said:—

श्राष्टिः न रक्षम् प्रसर्ता अविन तस्माद्। क्रो ११६।१६॥

i.e., As the parts of a chariot depend on the pin of the axle, so the Amritā molecules rest in Savitā.

(b) In the hymn containing many riddles, it is said:—

यज्ञ चक्षुः प्रम्रत्त्वम् भागम् प्रतिभवते विद्यज्ञप्रभतः। क्रो ११६।१६॥

i.e., Where the well-winged rays, ceaselessly tune the sound vibrations¹ with a correct knowledge, for their share of the immortal Āpah molecules.

(c) Another mantra addressed to the Sun says:—

यज्ञ चक्षुः प्रम्रत्त्वम् गातुमस्मै। क्रो ११६।१५॥

i.e., Where the immortal Āpah molecules paved the path for the Sun to proceed.

(d) The above is true, because in a mantra of the Āpah, it is said:—

श्राष्टिः शत्याण्डम्। क्रो ११६।१६॥

i.e., The immortal nectar is amidst Āpah molecules.

Amidst Waters—Modern science has discovered hydrogen and oxygen in terrestrial water. The Āpah of the mid-region exist in an electrified form. I do not know about the exact state of Āpah in the Sun. Light is required on these points, and then it will be settled, what sort of immortal nectar is amidst the Āpah, which abounds in the Sun.

2. Rita—a form of Āpah. Compare Nighantu 1. 12. Water is called the cause of rita:—

श्राष्टिः योगिः: उदधम । निष्ठयु ११९॥

(a) A mantra in praise of the Sun records:—

श्राष्टिः सदनात्: प्रादिष्ट्यान्तः। निष्ठयु: १२४॥

i.e., From the abode of rita—the Sun.

(b) In a mantra pertaining to Varuṇa:—

तुलाबन्धम् ग्राहित्यम्। तृतौ प्र. १२१॥

i.e., The possessor of rita, the Sun.

3. Ghrita also stands as a name of water.

4-5. Ćandra and Śukra varieties of Āpah are also found in the Sun.

6-7. Bribuca and Busa varieties, which get broken up on the surface of the Sun are already mentioned on p. 29.

Electrified Apah in the Sixth layer—The behaviour of water—vapours after their rise from the earth with the help of the Agniih molecules, and after crossing the boundaries of the mid-region is described by the sage Vyūsa:—

यस्मन् चित्रपत्रम् दिब्यम् भवन्यार्थे सङ्ग्रहायत।
पुष्पं चाकारण्यं वास्तवों विषम्यम् चिन्द्धितं।।६६॥

द्वारात् प्रति तहा यस्मन् एकरसिंहविवाहकः।
वद्वरः संस्यस्यस्य वेन्ष भाति वसुमचरा।।७०॥

यस्मादाच्यास्ये सोमे योनिदिब्यो भयतस्य यः।
ष्ठ: परिवहो नामस्य जात्यतांतिये।।७१॥ शास्त्रिपदे। प्र. ३२६॥

i.e., The sixth layer of Vāyu is termed as the parivaha zone, [for it helps in the rotation of the planets, the stars and other heavenly bodies under the control of Dhruna—Dolphin.] In its atmosphere the Āpah or the water particles become agitated and move in circles and are electrified. This layer serves as a check and allows not the waters of the sacred Gangā river of the upper-atmosphere to fall downward. In this layer, the Sun which has a single type of rays, when struck from a distance [by the Āpah particles,] becomes the source of a thousand rays. This makes the earth to appear bright. On account of this layer, Soma, the birth place of the divine nectar, thrives.

Note—The seven zones of Vāyu are often mentioned in ancient works. A perusal of them all will be extremely useful. Some of the sources are Manu 1. 26—, Sāntiparva 307,28 and 336,54-71. Vāyu purāṇa 49,163. Śākuntala VI. Water

1. यश्नास्यनत्मः। यजुर्व १ १२ १ २०२ । चुजका ह्राष्ट:। तृतैः प्र. १२०॥१०॥

प्रसो वा ग्राहित्यम:। काठक सूर २८१.१०॥ प्र. प्र. ६५।१०॥१०॥
particles, or any of their transformation, gets further transformed in the sixth layer. Here it is that the Āpah molecules become agitated and begin to dance in circles. When these particles strike the surface of the Sun from a distance, they are disintegrated and create heat and stick to the rays and transform them. So far, I have been able to gather this rough idea only from the above account, as well as from other hints found in various contexts.

Soma as fuel—Besides, Āpah molecules, Soma also serves as a fuel for the Sun. It is said:

पवमान पवसे गाम गोना जमान सूर्यम् अभिन्नो श्रकः।

क्र० द१६३३५।

i.e., O Pavamana Soma! you flow towards the abode of rays; and being born [in a new form, on account of disintegration] fill the Sun with your lustrous particles.¹

Note—How Soma is born in the Sun, and when has it flown towards it? The simple answer is that it assumes a new form after disintegration, just as the Āpah molecules do. The disintegration of the Āpah molecules is noted on p. 29.

Modern discovery—Modern science has recently reached at the result:

“Bethe (1938-39) asserted that the energy of the sun is the product of a cycle. On the sun, hydrogen produces helium, and energies are released in the process which are sufficient to make good the sun’s loss of heat for billions of years to come.”²

Note—I will suggest that instead of “energies are released” we should write, new forms of molecules or atoms come into existence.

A physicist writes—“Under the conditions existing in the solar interior, all molecules and atom which form ordinary matter are almost completely broken up into their constituent parts.”³

THE RAYS

Vedic works record that the Sun, the Moon, Varuna,⁴ Maruts, Vāta and many other gods possess their own rays. I will, however, write about the rays of the Sun.

1. पवमानस्य रसमयः। जै। प्रा। द१६३५।
4. Skanda svami clarifies it in his com. on Rig. 2.25,13.
Sun held by its rays—It is said that the Sun is held by its rays:

मासा रशय: । रशयो मह: । तैरसावाड़िष्ठयो वृत: । जै स्रा ११५१५।।
i.e., Months are the different rays. Rays are Maruts. By them is the Sun held.

Physicists say that the Sun is made entirely of gas.

Note—How is the Sun held by the rays and the months, is a matter, which requires further study?

Rays are Seasons—An important observation is that rays are seasons:

रशय: खण्डव: । काँठक सं २६१७।।

This observation is strengthened by a statement which says that the number of rays differs according to different months. This is noted in the ancient dictionary of Vyadi (2800 B. V.) as quoted by Hemacandra:

रुपोद्वादा पुनरस्यांतिरिभ्यन्ते शिर रशय: ।
शतानि द्वादशस्यां त्रयोदशीव मासवे ॥
बलुप्वेः पुनर्ज्ञोर्थो नमोमास्ययोत्सया ।
पञ्चदशीव द्वादशेऽ योडण्यैव तथाविजने ॥।
काठिके ब्येकावश शतान्जेष्व तपस्यसि ।
मार्ग एव दश सात्तीनि दतान्देव च कालगुने ॥।
पौष्प एव परेष मासि सहूल्यं फरिष्ठा रहे: ॥३

i.e., And, again, with the change of a season, the predominance of rays also changes. In March-April twelve hundred; thirteen hundred in April-May; fourteen hundred again in May-June, and also during July-August and August-September; fifteen hundred in June-July; sixteen hundred in Sept-Oct; in Oct.-Nov. eleven hundred; the same in Jan.-Feb.; in Nov.-Dec. 1050; and also 1050 in Feb.-March, and during Dec.-Jan. one thousand rays of the Sun.

The following table will show it in a clearer way:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rays</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>1200</td>
</tr>
<tr>
<td>April</td>
<td>1300</td>
</tr>
<tr>
<td>May</td>
<td>1400</td>
</tr>
<tr>
<td>July</td>
<td>1400</td>
</tr>
<tr>
<td>August</td>
<td>1400</td>
</tr>
<tr>
<td>June</td>
<td>1500</td>
</tr>
<tr>
<td>Sept.</td>
<td>1600</td>
</tr>
<tr>
<td>Oct.</td>
<td>1100</td>
</tr>
<tr>
<td>Nov.</td>
<td>1100</td>
</tr>
<tr>
<td>Dec.</td>
<td>1050</td>
</tr>
<tr>
<td>January</td>
<td>1000</td>
</tr>
</tbody>
</table>

1. प्रभुरामदामद्रामसि २१६१५।। उद्धृत।
Note—If all this is correct, its source should be found out. I have not yet succeeded in this.

Most Splendid Rays—Of all the objects which shed rays, the Sun is the source of the most splendid rays. It is said:

स्वर्गमुरसिसंघेण्टोरशिमः | यजुर्व २१३१।।

And the Śatapatha explains it as:

एष वै अभेण्टोरशिमः यत्सूर्यः | चाओ भाव १११५।।

i.e., This Sun, indeed, is with the most splendid rays.¹

Another Brāhmaṇa work repeats in a similar way:

स्वर्गमुरसिसंघेण्टोरशिमः | देवानां संस्कृतः | देवानां यजुः |

ततो भाव १११६।।

i.e., Well existing art thou, the most splendid ray, the meeting place=assembly of the gods, the sorcerer of the gods.

Cause of brilliancy—The first birth was of the Earth, the second of the Mid-region, and the third was of the Sun. The Sun received its extreme brilliancy from his very birth. It is said:

वृत्ततृतीयम् उल्भम् उपालुम्स्रयज्ञः — हरितम् भ्रमर्वतः | तस्मात् तत्र तिविकम् |

जैए भाव ३१३२।।

i.e., The third membrane which surrounded the embryo, when it was taken away, it became pale-yellow or pale-red Therefore it is the most brilliant.

The chemistry of this membrane, is yet hidden from our eye.

Variety of Rays—Yāska has read fifteen names for rays in his Nighantu lexicon. The Vedic Samhitās often read:

अंगुष्ठ्व वृहिल्ट रशिमच्छ में | तैः संस्तो ४१७।।

यजुमल्लव्र अंगुष्ठ्व रशिमच्छ | मैौ संस्तो ३।७१०।।

i.e., Arishu ray and Raṣmi ray.

Both these are quite separate types.

¹ Eggeling and Caland: "the best ray of light" This translation is against the text, it should be as I have given above.
The Vedic commentator Skanda-svāmi quotes under Rig. I. 24, 7 and 25, 13, a lexicon, which records more names of rays. So, it is certain, that the Seers knew many kinds of rays, as well as the minute differences between their composition and actions. Therefore it is said:

श्राहिः मूडो बहुरूपे भवति। बहूणि है रजस्मां हृदविशः।
मै० स० २१२१२१२। २१५२१२।

i.e., Verily, Agniḥ when created assumes various forms. So many certainly, are the forms of the rays.

Various molecular arrangements of Agniḥ have already been related.

A hymn to Rays—There is a hymn in the Rigveda (VI. 28) with the deity gāvah, i.e., rays. It throws a flood of light on their composition and actions. There it is said:

प्रजावति: गुहथपा:। कृ० ६१७२।२१।

i.e., Having progeny and of various forms.

Thousand Rays—The Sun is the controller of a thousand rays. In a hymn of the Rigveda addressed to Indra, the Sun is said to have a thousand rays:

बुला हस्य हरवश्वतवद। कृ० ६१५२।८।

i.e., One thousand harayah rays are joined in him.

It is thus explained in the Brāhmaṇa:

सहस्र हैत भानितमस्य रसमयः। जै० उ० त० ६१४२।१२।२१।

i.e., One thousand, certainly, are the rays of the Sun.

A hundred Rays—This has also been expressed that the rays are of a hundred types:

स एव [भानितम्] एकशतविष्ण:। तस्य रसमयः वार्ष विषा।
एष एव एक शततत्वो व एष लपति। श० बा० १२१०।२१।२।

i.e., And he is one hundred and one-fold: his rays are hundred fold, and he himself who produces heat, is the one hundred and first.

Functions of the One thousand Rays—Definite functions of all the rays are enumerated in the purāṇas. Their description is supported by Veda-mantras and, therefore, I reproduce the paurāṇika evidence:
i.e., The one thousand rays of the Sun, send forth rain, and cold and heat particles. Of these [rays], 400, having wonderful forms, cause rain. Collectively they are called Amritā, and separately Candana, Sadhyā etc. And again, quite separate from these, are 300, born of icy-cold; these are the subject of vision, and are called Madhyāḥ and Bāhyāḥ etc. These are called by the name of Candanaḥ; are of a dim light and are Gabhasti rays. Whitish and Kuhakaḥ are Gavāḥ rays; they nourish the whole world, and all go by the name of Suklāḥ; in number these are 300, and create heat.

This will be easily followed with the help of the chart given below:

<table>
<thead>
<tr>
<th>Sun — 1000 Rays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amritā rays, 400</td>
</tr>
<tr>
<td>create rain</td>
</tr>
<tr>
<td>of wonderful forms</td>
</tr>
<tr>
<td>coloured (?)</td>
</tr>
</tbody>
</table>

Cool Rays—These are mentioned in a medical text:

i.e., By means of cold rays, [the Sun] fills the world. The rays of the Sun change their colours according to the seasons. (Br. pu. 24. 41,42.)

Constituents of the Rays—The rays are composed of Vāyu, Agniḥ and Apiḥ paramānas. It has already been noted that the rays are the result of tridhātus (Rig. V. 47.4) or three

1. The reading of Vāyu 53-22 is pūrabbāḥ. i.e., of butter-coloured glow.
Mahābhūtas. Of these, the Āpah paramāṇus have three sub-classes, which are connected with the Sun. These are:

शुक्र छापः | प्रसुता छापः | चन्द्र छापः | तैः प्रा ११०६।।

i.e., The Āpah are Śukrā, Amṛtā, and Candrā. Most probably the author of the purāṇa had these three classes in view, when he wrote about the above three kinds of rays. Śukrā or Śuklā Āpah appear to have a greater number of Agniḥ molecules in them, while the other two have a lesser number.

White and Black Rays—Certain rays are called White rays and others Black ones. Those with greater number of Agniḥ molecules are white, while those with greater number of Āpah molecules are black. I have already noted the asita varnāh (rays of black colour). Another mantra also relates it:

श्रामासु विद्विद्धिषे पश्यति: पव: कुण्डायु ब्रह्म रोहिष्ठिषु।।

ऋ० ११६१६।।

i.e., O Indra! you place ripe milk in the unripe [cows], and brilliancy in the black and reddish [cows].

Note—‘Cows’ signify the cows of the earth and the rays of the sun as well. Rig. VIII. 89, 7. In this mantra, the action about the cows and the ‘pushing up of the Sun’ are simultaneously remembered. Therefore, the cows, in these contexts are only the rays of the Sun.

Some Black Rays, born of Rāhu—The great astronomer Garga records the following opinion:

कुण्डाय: कुण्डायुपयन्त्रा संकुला कुण्डायु:।

राष्ट्रकुस्थयस्तिविस्तात कीलकार्यात्विदाय:।। प्रभुस्तस्वागर, ३० १५।।

i.e., The sons of Rāhu are the thirtythree violent black rays; they are with black edges and black splendour, and are [called] pins, and are too sharp.

Note—The properties mentioned here may some day lead to future discoveries. It is not an account of the rays of the Sun, but I have quoted it simply to give an idea that the mid-region and the heaven do contain some black rays also.

Vāyu purāṇa, more explicit—Vāyu purāṇa records the black and the white rays of the Sun in a very explicit manner. It says:

1. ३० ३१११।। p. 277.
2. Cf. Rig. VI. 17, 6.
THE STORY OF CREATION

तत्स्मिन्तः यथार्थम् काले परिचर्य दिवाकरः
यज्ञायापि हि नेत्रेष्यम्: शुक्लाघुर्जनमस्तिभि: । वायु पु: ॥ १२ ॥

i.e., Then, under the influence of the seasons, at the right
time, the Sun after turning round, imparts Āpah to the
clouds by means of white and black rays.

Note—‘Turning round’ of the Sun has its own significance.
I have not yet clearly grasped this idea. The clouds get
Āpah particles is a phase, often met with in ancient works.

Birth of secondary rays—Primary rays were born during
the creation of the Sun. There are other rays also which
take their birth in the Sun. I have called them as the
secondary rays. It is said:—

१. सूर्योऽसहिष्ठे यथा शुभा। "च" ॥ १२ ॥

i.e., As the Sun gives birth to the rays.

२. विविक्षिता: समुःसङ्गे सूयोऽगः। "च" ॥ १६ ॥

i.e., The Sun gave birth to the secondary rays, with
the help of the primary rays.

In this connection hymn VI. 28 of the Rigveda, in praise
of the cow-rays, deserves special attention.

SEVEN RAYS

Of the one thousand rays of the Sun, already mentioned,
seven are often mentioned in the Rigveda:—

सृष्ट्य सप्त राहिमभि: । "च" ॥ १६ ॥

i.e., By means of the seven rays of the Sun.

SEVEN MAIN RAYS & THE PLANETS

Vāyu purāṇa is more explicit about it and says:—

१. रवि रहितसहस्रं यत्र परात्र। मया समुद्रः। "च" ॥

i.e., The one thousand rays of the Sun, which have already
been illustrated by me; of these, seven are the best, which are
the birth-place of the planets.

Heavenly bodies born of the Sun—According to the above
statement, the planets were born of the rays of the Sun. Not

1. The figure seven is important. Agnih of the higher regions,
Indra and Brihaspati have also seven rays.
alone the planets, but most heavenly bodies too were born of the Sun. It is said:

2. शक्तचन्द्रप्रहः सर्वविज्ञया सूर्यायं संज्ञयः।
   बायं दुगः १०।६१।७१॥३७॥३२॥
   i.e., [Twentyseven] Nakṣatras, the moon and the planets should all be known as born of the Sun.

When did it take place—From the above accounts, it appears to have taken place, when the Sun was yet near the Earth; for, as I have already said, the black in the moon went out of the earth to it, and this could not happen without their being in very close vicinity.

Further work—Vedic scientists will have to discover the source of the birth of many moons, which are rotating round the Jupiter. Moreover, it would have to be determined, whether the Sun is the cause of the light of those moons or the Jupiter itself.

NAKSHATRAS AT FIRST LIKE THE SUN

A brief mention of the Nakṣatras, has been made on pp. 148-49. A strange fact about them is worthy of note. It requires a careful study. The Seers say that all the Nakṣatras being born of the Sun, were just like the Sun at first. The following is the text:—

3. नातनं हृ वा एतानि-प्रथे ज्ञातस्य-मातुः। यथा एव-प्रसी सूर्यः-एवम्।
   लेखामेशा सज्जननेय वीर्यः क्षत्रायददा। तस्मादायतिष्ठः।।।।।
   यानि वै तानि क्षत्राय-वृषभः। न वै तानि क्षत्राय-भूवनं। हितः।
   टहः क्षत्रायं नक्षत्रनम्। ॥
   शतं सातं २१११।२ ११॥१॥

i.e., Many, indeed, in the beginning were these mighty powers (which radiated hot and cold rays) just as that yonder Sun. The Aditya, just when going up, took from them their mighty powers..............As he 'took from them' (ā—dā), therefore he is called Aditya. Those who have been mighty powers, shall no longer be mighty powers. Hence the powerlessness of the Nakṣatras.

Note—Such was the condition of these bodies in the beginning of creation. My explanation of the words, 'mighty powers,' as given in the brackets above is supported by the reading of the Kāṇva text, given below:—

4. तानि हृ वा एतानि क्षत्रार्थं शारदेशं तेपु यथासि वा सूर्यः-चन्द्रमा वा।।

i.e., All those mighty powers, indeed, radiated heat in many ways, as the yonder Sun, or as the moon [do.]

According to the observation noted above, shortly after their birth, the mighty powers cooled down.

A Natural Conclusion—Being born of the Sun, a source of hot and cold rays, its offshoots, the Nakṣatras and the planets also imparted hot and cold rays at first. Such state continued for a short time only. And when the Sun was just being pushed up, it, somehow, snatched away these rays from the Nakṣatras, and they became void of might. How the planets preserved these rays is a deeper problem?

Western Scientists—Scientists of Europe and America surmised at first, that our Earth had separated from a giant Sun. They, therefore, concluded that the earth at first was a burning ball. Later on it cooled down. But this theory is discarded now. The theories of ‘primordial vapour’ and ‘dust, cloud’ about creation are in the field now. These theories do not support the separation of the Earth from a burning giant Sun. Besides the surmises about the creation of the Earth, the views about the origin of the planets etc., are mere speculations with them. Astronomers like Sir James H. Jeans (1929 A.D.) and critics like Emanuel Valecovski (1950 A.D.) admit their inability to solve the problem of the origin of the planets.

The Seers—Vedic Seers, on the other hand, disclosed that the Earth was born of Prajāpati or Puruṣa, and not of the Sun. The Sun itself is an outcome of Prajāpati. Along with it they stated that the Nakṣatras and the planets did originate from the Sun. And further, that the hot and cold rays of Nakṣatras were absorbed, or rather snatched away from them by their parent, the Sun. How it happened should be found out?

Highest Truth—The above pronouncement of the Seers is one of the highest truths, in the domain of solar physics, preserved for mankind. Space forbids me to reproduce the entire material pertaining to the Nakṣatras and the planets.

Eggeling’s Remarks—I have, here, only one important point to bring to the notice of Sanskrit scholars. It is that totally ignorant of the depth of the nirvacana of the word Nakṣatra, explained above, and still more ignorant of the basic difference between the significance of the two words

1. This theory approaches the *arnava samudra* state mentioned on p. 100; and the difference between it and the ‘dust cloud’ state can be minimised easily.
vyutpatti (==etymology) and artha-nirvacana (==reason behind meaning), the Oxford Professor adds in a foot-note the remark: “This etymology of nakṣatra is of course quite fanciful.”

The Rays again—The above was an unavoidable digression from the subject of rays. I take up the subject proper again. The study of rays requires an elaborate description of all the one-thousand rays. Their names, origin, forms, composition and actions should all be related. I have not yet been able to catch them. The names of the seven main rays, which caused the birth of planets are surely enumerated. Some of them are mentioned in the verses of Rigveda also. Two other important rays are the Ādityās and the Angirāsas, which are confined to the north and to the south of the Sun respectively. They are mentioned in the previous chapters. The subtle causes of their difference are also mentioned.

Number—Besides these nine rays, the names and functions of fifteen others have been traced by me. These are described at length in my Veda-Vidyā-Nidarsana. A deep study in this field is a desideratum.

Notable Observation—As regards the composition of rays, it is often said that these are composed of Agnih and Prāṇa molecules. We know that the rays are extremely minute, for they pass through glass even. Therefore the molecules of Agnih and prāṇa in them must be minuter still, and at the same time not many. Now, a remarkable feature of the Angirā rays is noted by the sage Altareya:

अग्निरसास वा एको प्रणीतः। पौशो ब्राह्मणादिवीरि।
i.e., The Angirāsas consist of one Agnih (molecule) only. Such a fine distinction can never be made in an off hand way. It is apparent that some rays may contain two or even more

2. Yajurveda XV. 15—; Taitt. Sam. IV. 4, 3; Mait. Sam. II. 8, 10; Kap. Sam. XXVI. 8; Sat. Br. VIII. 6, 1, 16; Brahmāṇḍa purāṇa, purva bhaga XXIV. 65-71.
3. ये स्कृऽऽरा ब्राह्मणादिवीरि स्कृऽऽरो समवत्। पौशो ब्राह्मणादिवीरि।
   प्राणा रसमयः। पौशो ब्राह्मणादिवीरि।
4. Udayana writes:—
   स्फूटिकादीनां तेजसेदस्त्राशस्त्रित्तवेच्छाया। अद्र्द्धृत—स्थानादर्तनाकर,
molecules of Agnih. In another context this observation suggests a different meaning also. It is applied for a single altar for the sacrificer of Angirā gotra.

Form—Although the individual form of the rays is not known to me, yet it is a matter of common knowledge that the rays work in the form of a network. Five passages of different texts have been quoted on p. 232 of Veda-V.N.

Molecular Arrangement—The rays of the Sun are without a hole or a break. It is said:—

तद्वा प्रचिन्ध्रं पत्रिं यत् सूर्यस्य रचमय: । मैंो सरो ॥ ॥

i.e., That, certainly, which are without a hole, or are with extreme cohesion of molecules, and are flawless, these are the rays of the Sun.

Multiform—These rays are of various shapes. The Cow-ray hymn says:—

श्राविरी: पुक्कपा: । ॠे ६।२५।२।

i.e., [The Cow-rays] are with progeny and of multiforms.

Note—Progeny means that the Cow-rays create other rays. Being their offshoots, these are small. Multiform indicates the variety of their species.

MOTION

And now about their motion. It has been noted that the flow of light rays is not constant. The remarks of sage Patanjali, in this connection, are quoted on pp. 46, 47, to the effect that the rays are “drops of light”, and “every time new rays and new rays appear [and then travel].” The velocity of their propagation has also been noted on p. 3. A further light may be gathered from another mantra:—

सङ्कर्घ्याय चक्षु: परि व्रो देवो नैति सूर्य: । ॠे ६।४५।२।

i.e., His [of the group of Maruts] action, to cross round the heaven, takes no time, like the illuminating [rays] of the Sun.

Similar High Speed—Speed of light rays of the Sun and Dawn has been noted on p. 297. The above cited mantra
talks about the speed of the rays of the electromagnetic Maruts. In all the three cases the Veda uses a single word sadyāḥ to denote their speed, showing that the speed is the same.

Wonderful Coincidence—Modern physicists also have reached at the same conclusion. Leigh Page and N. I. Adams write:

"All electromagnetic waves travel with the same velocity c [of light] in empty space, being distinguished from one another only by differences in wave length and frequency."

Note—The electromagnetic nature of the Maruts and the existence of their rays is already mentioned.

Their motion assumes many forms. I have, so far, noted the following three:

I. BENDING

The rays do not travel in straight lines. Some of them take a "bending or a lowering course, when ascending to the back of heaven." (p. 216)

II. TREMBLING

1. The Rigveda says:

दाब्बतौ रक्षय: सूर्याय बर्मन्स्य-अवाधुस्तताय प्रद्यम्बतः: ॥चौ ४।१४॥

i.e., The trembling rays of the Sun, kept the darkness below, in the Āpaḥ of the mid-region, just like a skin [which covers darkness].

Note—The simile requires a thorough explanation. It is found in a slightly different way in another mantra: "Who rolled up the darkness like a skin." Rig. VII. 63, 1.

2. Vriṣākapi is a name of the Sun, for it goes trembling:

प्रथ यदू रक्षिमप्रकम्भवन्ती तदू दशाकपिरङ्गवति ।

nirukt १२।२७॥

i.e., And when it comes trembling on all sides, by means of the rays, then it becomes Vriṣākapi.

The same fact is explained by Śaunaka:

रक्षिमप्रकम्भवन्ती । बूँ दे २।६॥

3. Deep or mysterious sounding and trembling is expressed in another mantra:

i.e., That well-winged [or having in it the well-winged rays], who lighted the mid-region, the deep or mysterious sounding and trembling, fully conscious and adorable [Sun].

4. Angirā rays and their allies, the rays of the Ribhus etc. are also deeply trembling:—

विरुपासः हर्तमयस्त्र इत्वगम्भीरवेयसः ।

तै स्वविलसनः सूनवस्तैः यथने: परिजिनीरे ॥ अ० १०।१६२।१॥

i.e., Of various forms, verily, those Seers in the form of Angirā rays; forsooth, deeply trembling, those sons of Angiras were born of the Agnih molecules.

III. CREEPING

In certain Vedic mantras we find mention of the serpents who dwell in the rays of the Sun. These rays are the Ādityā rays, and are often called the Cow-rays.1 These serpents have a separate entity, but somehow have found their place in the rays. They are mentioned in Yajurveda XIII. 3. On their account these rays travel in a creeping manner.1 Therefore, the Seer Vālmiki, who is a Vedic Seer and simultaneously, a composer of the celebrated Rāmāyana says:—

मूलध्ये:—उपसर्गभु: । बाणो वाणो राणो भरण्य १६।१॥

i.e., By means of rays, which softly creep.

Note—What particles, work like serpents in these rays? This topic is not under my study, though its importance cannot be denied.

I. RAINBOW

The phenomenon of rainbow is connected with the rays of the Sun. It is only briefly described here, as space does not allow me to give a fuller treatment.

(a) The astronomer Varāhamihira (earlier than 5th cent. A. D.) quotes the following verse of the ancient Sāṁkhya teacher Vindhavāsi:—

सूर्य्यस्य विद्विधापात्राः पवनेन विप्रक्षिताः कराः सावे ।

विबिधिः प्रभु: संस्थाने व इसर्वने तथिन्द्रनु: । बुद्धसंहिताः ।

i.e., The different coloured rays of the Sun, being broken up or arranged by the wind on a cloudy sky, are seen resting like a bow, that is the bow of Indra.

(b) The great poet Kālidāsa writes:—

बल्मीकःसङ्ग्राम 1 श्रवणम ्यत्र: लक्ष्मणाक्षण्डलस्य । मेघदूतं, पूर्वमेघ, १५।

i.e., From a cloud¹ in sunshine¹ is born the part of the bow of Indra.

(c) Rāmadāsa (1595 A. D.) writes in his commentary on Setubandha:—

नानामतिरितिसंपत्ता सूर्यमेंत्राः जले शुक्लयुक्तत्वः। १३१६।ः

i.e., The birth of the bow of Indra in water [drops] is caused by the rays of the Sun, which come into contact with various prism-like marici rays [of the Maruts].

(d) Kāśyapa (3300 B. V.), the great astronomer writes:—

प्रत्यतस्यकुलसङ्ग्राम ्यत्र: पन्नहः कामिन्यः।

सेयां निश्चाससमूत्त शक्षनां प्रचुल्ल। सदस्यसागर, उद्योग, १५। २६७

i.e., The serpent-like creeping particles attached to the rays, and born in the family of the great serpent (ananta), which make a belt round the earth, and which assume different attractive forms, the rainbow is called as born of the breath of these.

Note—As fog and mist are caused by the winds coming from the quarters, so the rainbow is caused by these special particles. I have not been able to trace a clear conception of this aspect.

(e) The colours of rainbow are already quoted on p. 51.

English Word—The English word rainbow is merely a translation of the Sanskrit word Indradhanu, which belongs to a very very old period.

Modern Verdict—Modern physicists explain this phenomenon in almost similar words. Gamow and Cleaveland write:—

"We often see a brightly coloured arch against the dark back-ground of the departing clouds opposite the sun. The rainbow is an optical phenomenon caused by the reflection and refraction of sunlight in the tiny spherical raindrops on which it falls (p. 266)."

1. बल्मीकः:==सातपो मेघः। बललभदेवनीकः।
II. RAY STAFF, HALO and SKY CITY

Raśmidaṇḍa, Pariveśa, and Gandharva Nagarā² are three other phenomena which are also connected with the rays and find mention in ancient texts.

III. MIRAGE—MARICIKHA

Sanskrit and English words—The Sanskrit words Maru-Maricikha, Maricikā and Mriga-Triṣṇā are all used for one and the same phenomenon. The English word mirage is only a corrupt form of the Sanskrit word maricikha. The letter ‘e’ at the end of the English word cannot be explained without accepting that it simply represents the ‘i’ sound of the Sanskrit word. The right interpretation of the phenomenon is embodied in the Sanskrit word itself. This will be clear from the following description.

A mention of the phenomenon is found in many ancient works; e.g., (a) the lexicon of Amara I. 3, 34; (b) Abhijñāna Śākuntala VI. 18; and (c) Vyākaraṇa Mahābhāṣya IV. 1, 3, etc.

Explanation—I quote here passages from two works, which relate the cause of this phenomenon. The first work is of Viśnugupta=Vātsyāyana (1400 B.V.). He writes:—

(a) ग्रीष्मे मरीचयि भौमोक्षयि संसूरताः स्थन्द्रमाना दूरत्वस्य भक्ष्या सन्निकृष्टहारः।

(b) सूर्यमरीचिविष भौमोक्षयि संसूरतेतु न्यन्त्रमानेनु न्युनतृत्विन्दिनवति।

i.e., During summer, the marici rays of the Sun, having come into extremely close contact with the heat particles, which are radiated from the earth, and then moving in a quivering way come into contact with the eye-rays of the observers, standing at a distance. There, on account of the sense-object contact, it is water; this apprehension springs forth. This is applicable as sense perception.

Note—Six conditions are considered in this explanation.

(1) Hot weather; (2) marici rays of the Sun; (3) heat particles radiated from the earth; (4) a close contact of nos.2

¹. महाभाष्य, श्राविण्य, १४२४।२८॥ न्याय महृदी ॥ १७२।
and 3; (5) quivering movement of the closely attached rays and particles; (6) sense-object contact, and the result is the apprehension of water.

**Special Feature**—Why is the phenomenon of mirage observed during summer only? Because unless the union of the marici rays of the Sun and the hot particles of Agnih radiated from the earth takes place, and further, unless the quivering vibration of these happens, this phenomenon is impossible. The radiation of heat particles from the earth is related on pp. 246, 247 under the heading “Warm and cold water in wells.”

The second work is of the Jain teacher Hemacandra. He writes:

_मरिचप्रतिकृति: मरिचिका। प्रीग्रेम हित हितकुलासु प्रकर्करा: प्रतिपक्विता_  
_जलवेणे धारणाती | प्रभवाधानितामणिः २१५।।_

i.e., An image of marici is maricikā. During hot weather alone, in deserts, the rays of the Sun, being reflected, appear as water.

**Modern physics**—Modern physicists explain this phenomenon in slightly different terms. Two of the latest explanations are the following:

1. “Owing to the continuous fluctuation in refractive index due to moving air current of differing density, the illusion of rippling water is easily produced.”

2. “The image of dune appears upside down, and light from the sky behind the dune appears to be coming also from the ground giving the impression of a lake.”

**The Secret of the Marici Rays**—It should be remembered that the marici rays are:

_एला वा स प्राप: स्वराजो वान्मरिचयः। श्रो व्रो ५१४१२४११।।_

i.e., These, certainly, are āpah particles, which roam freely, that are the marici rays.

Almost a similar result is deduced from an observation recorded in Aitareya Upanisad I. 1, 2, which says that the three words ambhaḥ, maricīḥ and āpah are synonymous.

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So the apprehension of water in the marici rays is but natural. The hot particles radiated from the earth, after joining with the marici rays, and their quivering vibratory motion appear to help in the vision of water in a clearer way.

The factor that the marici rays do contain āpakh—fine water particles is not known in modern physics.

Quivering motion—During winter the phenomenon is missing. The cause is quite clear. In winter the earth does not radiate hot particles, and hence the marici rays do not join with the hot particles of Agnih, and consequently do not show a quivering vibratory motion. This hidden cause also is not found in modern works of physics. However, the expression “the continuous fluctuation” and “quivering vibratory motion,” are remarkable.

Another example of heat from the earth—It is observed that during the rainy season, the ants carry their eggs from the upper layers of the earth to the lower ones. It foretells the coming of rain. Contradicting that the carrying of eggs is not the cause of rain, it is said:

कृष्णमानि: खलु पिपिलिका मोनेनोधम्मा स्वाम्यण्डानि सृष्टिसुप्रिय-व्यापथिष्ठानवरीमात्रेन।

i.e., The ants, being made hot by the heat of the earth, carry their eggs from the lower layers of the earth to the upper ones.

The fact of the radiation of heat particles from the earth, during hot weather, was noted long ago.

Enlarged bodies in deserts—Another observation is recorded in the language given below:

(a) मर्हू स्वस्त्यप्रमिर्द्वाय पत्रं परिपरिमाणं हस्यते। शाब्दिः

(b) मर्हू—प्रपित्यपरिमाणं परिपरिमाणं प्रवरिपरिमाणं दर्शनम्। शाब्दिः

(c) पुरे यथा या मर्हू महानन्यं हस्यते। शिष्ठि। श्वेतयते पूर्णं सर्थौ।

i.e., In deserts small objects appear greatly enlarged; a tiny object is seen of the size of a mountain.

Ray reflection and mirrors—It is again recorded that the different kinds of mirrors form different kinds of images:
i.e., (a) As in mirrors the images formed are long, round, big; and others even are seen.

(b) For example, in concave mirrors the image of the face is seen raised, and in convex mirrors, the image is gone down; and in a sword, a long image; and in the oil of priyanugu a black image of the face is seen. Again weapons imported from China, and in quartz imported from Greek countries, various kinds of images are seen.

How, after the charge of a tvāstra astra, innumerable images of the charger are seen in the atmosphere, is a subject for research? (Droṇa parva. XVIII. II)

This observation is recorded in many works. I have given a specimen only. A concave mirror is nimmatala-ādāra and a convex mirror is unntagatala-ādāra.

Gamow and Cleaveland’s suggestion—These physicists have suggested:—

“instead of “seeing an object in a mirror” it would be clearer to say “seeing the image which the mirror forms of the object.” (p. 246.)

This is an extremely healthy suggestion, and removes a long standing wrong expression. The Sanskrit authors, from very-very ancient times have always used the words bimba=object and pratibimba=the image of the object, or rūpa and pratirūpa.

Penetration into deep water—It appears that all rays do not penetrate into deep waters. Different rays penetrate to different depths; and heat carrying rays have their own course. In this connection the following observation is noteworthy:—

[At the supposed death of the Pāṇḍava, Duryodhana’s heart was depicting a behaviour] of a deep lake which during summer is cool below and hot at the surface.
ADJUSTMENT AND SETTLED MOVEMENT

Hurting each other—The planets, the nakṣatras, and the stars had come into existence, but their motions were not yet finally settled. There was a fear that they might collide and destroy each other. A glimpse of this fear is found in the following statements:

1. नेत्रयोग्यं हिसाब इति। गृहतिरिक्षेत्रं बुधयेः। गृहतिरिक्षेत्र हीमे ग्रामाण्यान्योग्यं विश्वास्ये। शत्र १२।२१।१६।

i.e., So that, they may not hurt each other............ by means of the mid-region; for on account of the mid-region those two, the heaven and the earth are firmly kept asunder.

2. प्रजापति: प्रजा प्रभुत:। ता प्रजापतिरितरमोचन:। स एतां प्रभुत:। ततो वा इदं व्याख्यात:। गायो
श्रद्धा ग्राह्य:। पुष्प:। पुष्पाः:। सुग:। सुग:। तात्र १२।२५।१।२।

i.e., Prajāpati created the subjects; these, not being kept apart (and) not agreeing together, devoured each other. This pained Prajāpati. He saw these days (i.e., this forty-nine days rite). Thereupon, this became separated; cows (=cow-rays) became [settled]; horses (=aśva rays) became [settled]; men (=naras of the mid-region) became [settled]; deer nakṣatras [became] deer.

Note—These cows etc. are not of this earth. The earth was not yet ready for the appearance on it of plant-life even.

3. नाना वा एतो जय सोम प्रभुत:। भृष्टाय महस्य च। ताः प्रजा
प्रभुता प्रजापतिरितरमोचन:। काठक सं २७।४।

i.e., Many, certainly, at first absorbed the Soma. This was for Mitra and Varuṇa. Those subjects being disturbed and not kept apart behaved as hurting each other.

Note—The above statements are not mere deductions of an advanced intellect, but are, as tradition affirms, the direct outcome of the vision of the Seers.
Adjustment—This vast universe is not without an eternal plan. Every physical force appears at a definite period and has to play its part, and that also under a definite plan. Certain forces, not fully known to me, worked, and the final adjustment took place. It is said:

इनी अः लोके∗∗∗∗∗∗∗∗∗∗ऽवधः ज्यवध्वलाम्। ततो हु वा इद्द्दः ज्रवक्षीववम्
अन्यो क्षणतुष्ये बस्तति। यशवृहुः हु वा तत: धुरुपुरुः यथावानुति वा।

i.e., These two worlds......................................they [the heaven and earth] married [entered into a contract.] After that period they have begun to dwell in each other's house, formerly they had dwelled each in his own mansion or along with those of a common birth.

Note—The ancient Sanskrit words for a mansion are: griha, duryā, sadana and rāṣi. In this connection the next half-verse of Rigveda should also be noted:

नाना चक्तः सत्वत वश्ये समतेन क्रेतुण संविद्धते। शृोऽृहोऽऽी।

i.e., Both [heaven and earth], according to an agreement to satisfy each other, revolve through different dwellings, like a bird that occupies diversified nests.

Bhumi bestowed with a dwelling—In its earliest stage, the earth was seeking for a stable resort. Indra performed this deed, and the mantra says:

ति सामताम् हिविरामिन्न शृवम् महीमपार्वः सत्वत सत्वप।

i.e., O Indra! you placed the level and shoreless bhūmi (=earth in its earliest form), moving hither and thither, in its own house.

Joyous Indra exclaimed—When performing the above act, Indra, gave vent to the feeling:

हःताहृ प्रविर्भीमिन्न ति ब्रंचानोह् बेहः वा। शृोऽृहोऽऽी।

i.e., Oh! I may place this earth here or here.

Note—This adjustment was wonderful and was a step toward the revolutionary movements of the planets. The earth at that time, was still level and shoreless.
The Sun and its motion—The Sun was pushed up. It had given birth to the planets and stars. It had yet to become the controller of its system. Its house and motion was also made regular. At last it gained its present position.

Vāta and Ribhus—Vedic descriptions are unique. The link of this story requires me to mention these two gods. Vāta which moved with the Maruts prepared the way for the revolutions, and the Ribhus, the heavenly carpenters, and the great cutters shaped the planets and the stars. The revolving machinery with Vāta at its back, began its work and day and night came into existence, as already noticed.

Motion, Side-Ways—The Brāhmaṇa (3200 B. V.) very clearly states about the manner of the motion:

\[ \text{तो ह वा भाको भाविवृत्तो वर्णः न पराह्} \]
\[ \text{तिप्लु च ह वा एषं। वस्तु वा एष मासो दक्षिणांति। यथा उद्ध।} \]
\[ \text{जै-ब्राह्मण २२१७२।} \]

i.e., Yonder Sun, verily, [moves] neither downward, nor upward. Horizontally he moves. For six months he goes to the south, and for [the other] six to the north.

Just-like a boat on Water—I have mentioned that Vāta is the real cause of the motion of the planets. The manner of its working is explained in the purāṇas:

\[ \text{यथा नद्युक्ते दौस्तु ग्राहिन्यं सहोरं।} \]
\[ \text{तथा देवायं होते उज्जलम् वातरिमिथं।} \]
\[ \text{वायु ५२५५॥} \]

i.e., As a boat, on the water of a stream, is carried along with the water, so are carried these residences of the gods (planets etc.) by means of the reins or rays of Vāta.

Central disk—The planetary motions are all controlled by a central disk. The purāṇas explain it at great length, the motion of the Sun and the planets in relation to Dhruva, the dolphin-like cluster of stars, beyond the highest place of naksatras. The Dhruva is compared to a small disk, to which are attached thousands of spokes in the form of the veins of Vāta (=arranged particles of extremely subtle wind). The Sun and its companions are attached to the ends of the
spokes and occupy a far stretched extensive space. With the revolution of the disk the Sun revolves with the planets. This is a rough description of the part played by the Vātaveins. I do not follow the whole line of argument.

Dhruva’s movement—The basis of this explanation appears to be a very old one, as the movement of Dhruva is remembered in an Upaniṣad also:—

ध्रुवस्य प्रश्लनम्। मैत्रायणी उप । \(114\)

i.e., The special movement of Dhruva.

Axle of the universe—In this connection it is to be noted that the axle of the universe has already been mentioned on pp. 27, 28.

Modern View—Western scientists have to cover many steps, for an exact understanding of this story, by their experiments. One of the latest surmises in this respect is given below:—

“It is, of course a pity that we cannot see the mysterious galactic center around which our sun is spinning, along with billions of other stars. But in a way we know how it must look, from the observation of other stellar systems or galaxies scattered through space far beyond the outermost limit of our Milky Way. It is not some super giant star keeping in subordination all the other members of the stellar system, as the sun reigns over the family of planets.”

Certainly, marvellous is the flight of the scientific imagination of Gamow and his fellow companions in the field, who are slowly and slowly reaching near the truth.

INDICES

I. Authors

Abetti, 24
Adams, N. I., 313
Agastya, 267
Agniśeṣa, 227
Aitareya, Mahidāsa, 12, 58, 75, 113, 121, 144, 193, 243, 311
Amara, 121
Anaxagoras, 65, 97
Angirā, 163
Bahal, 225
Barnett, Lincoln, 157
Bhāradvāja, 163
Bhatta, Kullūka, 280
Bhatta, Jayanta, 8, 76
Bhatta, Nāgoji, 17
Bhatta, Rāghava, 57
Bhikṣu Vijnāna, 81
Bhoja, 265
Bhuvanadeva, 227
Bohr, 55
Brown, W. N., 94
Budge, E. A. Walles, 109
Caland, W., 90, 105, 116, 143, 155, 160, 166, 169, 176, 229, 238, 241, 304
Caraka, 79, 81, 227
Cakrapāṇi, 5, 68
Champion, F. C., 317
Chandra, Kṣhitish, 96
Chandrāṇānda
(Commentator on Vaiṣeṣika Sūtras), 20
Chatterji, K. C., 257, 297
Cleveland, 4, 315, 319
Democritus, 62, 63
Deva, Charu, 82
Dirac, P. A. M., 6

Dīrgahatamā, 237
Dogigli, Johannes, 32, 34, 75
Durga, 91, 232, 269
Eggeling, 105, 138, 160, 190, 241, 242, 252, 304, 310, 311
Eilly, G. H., 241
Einstein, 15, 178, 194
Empedocles, 63, 97
Eratosthenes, 109
Gamow, G., 4, 63, 149, 152, 156, 157, 315, 319, 323
Ganga Nath Jha, 68
Garga, 307
Gāthā, Kauśika, 162
Gautama, Akṣapāda, 68
Geldner, K. F., 88, 103, 191, 257
Gotama, 163
Griffith, R. T. H., 88, 103
Grover, N. D., 216
Halāyudha, 129
Hari, Bhartrī, 4, 65, 72, 73, 75, 76, 127
Hemacandra, 35, 98, 216, 243, 303, 317
Heraclitus, 127
Herodotus, 109
Hesiod, 327
Hopkins, 262
Ilsley, Norman, 259
Indu, 230
Jaimini, 107, 112, 113, 237, 284
Jeans, James H., 310
Jones, H. Spencer, 156
Kālidāsa, 243, 275, 315
Kaṇāda, 68, 70, 211
Kaṇṭha, Nārāyaṇa, 36
Kapteyn, 149
Kāśyapa, 315
Kāṭha, 155
Kautālyā = Vātsyāyana
= Vīṣṇugupta, 3, 6, 17, 22, 76, 215, 266, 316
Keith, A.B., 160, 191, 262
Ketu, Śveta, 221
Krishna, Lord, 292, 294
Kumārila, 151
Lockyear, 24
Ludwig, 262
Macdonell, A.A., 93, 107, 151, 156, 185, 191, 262, 285
Mādhyaṇḍina, 113, 115, 125
Maheshwari, P., 231
Manetho, 109
Manoharilal, 231
Manu, 94, 105, 109, 113, 212, 213, 227, 273
Max Muller, 115, 123, 152
Mckenzie, A.E.B., 317
Megasthene, 119
Mendelsohn, K., 37, 44, 62
Moses, 110, 118
Muir, J., 88
Mūr̥dhanaṇṭa, 163
Nāgārjunā, 6
Nārāyaṇa (The inventor of Nārāyaṇa Astra), 205
Nila Kāṇṭha, 95
Newton, 268
Oldenberg, 183
Oldham, F., 38
Padmapāda, 18, 205
Page, Light 259, 313
Pālakāpya, 230
Pancaśikha, 231
Pāṇini 222
Parāśara 230, 267
Pāraskara, 148
Patanjali, 13, 19, 33, 60, 101, 266, 312
Planck, Max, 15, 47, 64
Prasāda, 225
Praśastapāda, 44, 108, 267
Priestley, 62
Partington, 207
Rāja, Kunhan, 277
Rakṣita, Śánta, 265
Rāmadāsa, 315
Rossi, Bruno 5
Roth, Rudolf, 109, 115, 152
Śacchi, 24
Śākapūṇi, 39
Śālikanātha, 78
Śāmba, 292, 294
Śarvānanda, 214
Śaunaka, 164, 271, 278, 313
Śāyana, 130, 236
Seal, B.N., 5, 21, 40, 58, 60, 76
Śeṣa, 65, 216, 274. 293
Shukla, Karuṇesha, 77
Skandasvāmin, 140, 153, 160, 170, 268, 305
Śrīdharavāmin, 79
Sūri, Tilaka, 51
Sushruta, 205
Ṭāṇḍīna, 107, 236
Thomas, F.W., 74
Tittiri, 70, 209, 213, 236, 277, 291
Tuli, 225
Udayana, 21
Udīśālaka, 221
Udyotakara, Pāśupata, 6
Urey, Harold C., 126
Vācaspati, 266
Vāgbhāṣṭa, 266
Vālmīki, 271, 314.
Valecovski, Emanuel, 310
Varāhamihira, 50, 265, 271, 314
Vātsyāyana : Kautālyā, 3, 6, 17, 72, 76, 215, 266, 316
Velankar, H.D., 172, 191
Vidyarthi, R.D., 231
Vindhyavāsin, 50, 51, 314
Viśvakarmā, 227
Vrisābhadēva, 76
Vyādi 94, 127, 303
II. Titles of Books

Ancient India, (Megasthenes) 120
Bible, The Holy, 107, 110, 118, 119, 180, 219, 282, 283, 286
Biography of the Earth, 156, 157
Biology (P. Maheshwari & Manohar Lal), 231
Books on Egypt & Chaldea (By E.A. Walles Budge), 109
College Physics, (G. D. Tuli), 59
Cosmic Rays, 5
Earthquakes (G.A. Eilly), 241
Elementary Physics, (B. L. Manchanda & B. C. Gupta), 268
General Physics, 38
Greek Philosophy, (John Burnet), 65, 77, 97
Heat in the Rigveda (quotes W. N. Brown), 94
Herodotus-Book II, 109
Chemistry, Intermediate
Inorganic, 225, 226
The Ionosphere, (T. N. Gantier), 263
St. John, 116
The Legacy of the Ancient World, 49
Life on the Other Worlds, 157
248
The Magic of Rays 9, 15, 32, 34, 47, 300, 302
New Testament, 116
Nuclear Explosions, 42
One Two Three, 323
Outline of the Universe, An, 72
Physics, (Gamow & Cleveland), 4, 6, 14, 15, 16, 21, 28, 31, 32, 38, 43, 55, 58, 59, 60, 69, 83, 152, 194, 302
The Planet Earth (H.C. Urey), 126
The Positive Sciences of the Ancient Hindus, 5, 21, 81
Principles of Electricity, 259
313
Principles of Inorganic Chemistry, 216
Radioactivity & Nuclear Physics, 263
Sanskrit English Dictionary, 78
Second Course of Light, A, 317
The Sun, (Abetti), 24
The Sun, (Karl kiepen), 290
Sun, The Birth & Death of the (G. Gamow), 149, 157, 238
Text Book of Zoology, (R.D. Vidyarthi), 231
The Universe and Dr. Einstein, 15, 157, 194
University Physics, Part III, 317
The Upper Atmosphere, 248
Vedic Reader, A.A. Macdonell, 30, 157, 285, 297
Vedic Selections, 96, 257, 297
What is Atomic Energy, 37, 44, 62
III. Sanskrit Works

क्रमालग्न ५१, ५२, ५३, ५४, ५५, ५६, ५७, ५८, ५९, ६०
बाणवंदी ६१, ६२, ६३, ६४
श्रीमन्ताक ६५, ६६, ६७, ६८, ६९
श्रीमन्ताक पुंजाक ६०, ६१
श्रीमन्ताक भागुलामणि ७०, ७१
श्रीमन्ताक चिन्तामणि ७२, ७३, ७४, ७५, ७६, ७७, ७८, ७९, ८०
श्रीमन्ताक ८१, ८२, ८३, ८४, ८५, ८६, ८७, ८८, ८९, ९०, ९१
श्रीमन्ताक ९२, ९३, ९४, ९५, ९६
श्रीमन्ताक ९७, ९८, ९९, १००, १०१, १०२
श्रीमन्ताक १०३, १०४, १०५, १०६, १०७
श्रीमन्ताक १०८, १०९, ११०, १११, ११२, ११३, ११४, ११५, ११६, ११७, ११८, ११९, १२०, १२१, १२२, १२३, १२४, १२५, १२६, १२७, १२८, १२९, १३०, १३१, १३२, १३३, १३४, १३५, १३६, १३७, १३८, १३९, १४०, १४१, १४२, १४३, १४४, १४५, १४६, १४७, १४८, १४९, १५०, १५१, १५२, १५३, १५४, १५५, १५६, १५७, १५८, १५९, १६०, १६१, १६२, १६३, १६४, १६५, १६६, १६७, १६८, १६९, १७०, १७१, १७२, १७३, १७४, १७५, १७६, १७७, १७८, १७९, १८०, १८१, १८२, १८३, १८४, १८५, १८६, १८७, १८८, १८९, १९०, १९१, १९२, १९३, १९४, १९५, १९६, १९७, १९८, १९९, २००, २०१, २०२, २०३, २०४, २०५, २०६, २०७, २०८, २०९, २१०, २११, २१२, २१३, २१४, २१५, २१६, २१७, २१८, २१९, २२०, २२१, २२२, २२३, २२४, २२५, २२६, २२७, २२८, २२९, २३०, २३१, २३२, २३३, २३४, २३५, २३६, २३७, २३८, २३९, २४०, २४१, २४२, २४३, २४४, २४५, २४६, २४७, २४८, २४९, २५०, २५१, २५२, २५३, २५४, २५५, २५६, २५७, २५८, २५९, २६०, २६१, २६२, २६३, २६४, २६५, २६६, २६७, २६८, २६९, २७०, २७१, २७२, २७३, २७४, २७५, २७६, २७७, २७८, २७९, २८०, २८१, २८२, २८३, २८४, २८५, २८६, २८७, २८८, २८९, २९०, २९१, २९२, २९३, २९४, २९५, २९६, २९७, २९८, २९९, ३००, ३०१, ३०२, ३०३, ३०४, ३०५, ३०६, ३०७, ३०८, ३०९, ३१०, ३११, ३१२, ३१३, ३१४, ३१५, ३१६, ३१७, ३१८, ३१९, ३२०, ३२१, ३२२, ३२३, ३२४, ३२५, ३२६, ३२७, ३२८, ३२९, ३३०, ३३१, ३३२, ३३३, ३३४, ३३५, ३३६, ३३७, ३३८, ३३९, ३४०, ३४१, ३४२, ३४३, ३४४, ३४५, ३४६, ३४७, ३४८, ३४९, ३५०, ३५१, ३५२, ३५३, ३५४, ३५५, ३५६, ३५७, ३५८, ३५९, ३६०, ३६१, ३६२, ३६३, ३६४, ३६५, ३६६, ३६७, ३६८, ३६९, ३७०, ३७१, ३७२, ३७३, ३७४, ३७५, ३७६, ३७७, ३७८, ३७९, ३८०, ३८१, ३८२, ३८३, ३८४, ३८५, ३८६, ३८७, ३८८, ३८९, ३९०, ३९१
বিশালাচার-বিশেষিকা ৭৪, ৭৫
দ্বাদশতন্ত্র রূপ ২১
দ্বাদশতন্ত্রবিশ্বরূপ ৪৬
নরসিংহ গুরুরায় ১২০,
নিষ্পত্ত ১৫১, ৫০০, ৪০৫,
নিষ্কাত ২, ১৬, ২৬, ২৬-৩৪, ৪৬,
৪২, ৪৩, ৫৩, ৫৪, ৫৫, ৫০, ৫০,
৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫,
৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫,
৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫,
৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫,
৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫, ৫৫,
304, 311, 312, 322

यजुर्वेद 24, 44, 103, 104, 120, 124, 125, 126, 162, 181, 184, 203, 213, 222, 237, 249, 252, 253, 262, 264, 301, 304

याज्ञवल्क्य सूत्र २

मुक्तिकल्पः 264

सुखिदीकरिका ३, ४७, ५६, ६६, ६०, ६१, ६७, ६८, ६९, ७२, ७५, ८५, ९५, १०६, ११४, १२४, १२६, १२७, १३६, १३५, १४३, १४५, १५५, १५६, १६६, १७३, ३०६

योगसूत ८६

योगसूत-लालोजी गढ़ भद्र १७

योगसूत-वाग्स्वरति टिका (वयासभाष्य ७, ३०, ३३, ३६ योगसूत-वयासभाष्य २, १६, २६, ४५, ६६, ७५, ८५, ९५, १०६, ११४, १२६, २५५, २६६, २७३, ३०६, ३१५, ३२२)

रसार्य १४५, २१६ रसार्य समुज्ञय २६६ रामायण (वाल्मीकिकल) ६६, २७३, ३१५, (बाल पाठ ६६)

लघु-श्लोक-राज ५१

ब्रह्मविद्य बृहत्ताहिता ४ वामयपदीय ४, ३२, ३६ वामयपदीय-शब्दोट्टीका ३६, ३१५, ३१४